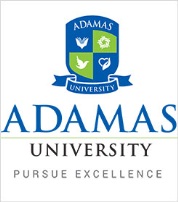
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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING**

**AND TECHNOLOGY**

**DEPARTMENT**

**OF**

**COMPUTER SCIENCE AND ENGINEERING**

**Bachelor of Computer Application (BCA) Programme**

**&**

**Bachelor of Computer Application (BCA) Programme**

**With Hons.**

**In**

1. **Gaming and Animation**
2. **Banking, Financial Services and Insurance**

**(W.e.f AY 2020 – 2021)**

**SoET 2.0**

**(Engineering+)**

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**ADAMAS UNIVERSITY, KOLKATA**

**SCHOOL OF ENGINEERING & TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**VISION OF THE UNIVERSITY**

**To be an internationally recognized university through excellence in inter-disciplinary education,research and innovation, preparing socially responsiblewell-grounded individuals contributing to nation building.**

**MISSION STATEMENTS OF THE UNIVERSITY**

**M.S 01: Improve employability through futuristic curriculum and progressive pedagogy with cutting-edge technology**

**M.S 02: Foster outcomes based education system for continuous improvement in**

**education, research and all allied activities**

**M.S 03: Instill the notion of lifelong learning through culture of research and innovation**

**M.S 04: Collaborate with industries, research centers and professional bodies to stay**

**relevant and up-to-date**

**M.S 05: Inculcate ethical principles and develop understanding of environmental and**

**social realities**

**CHANCELLOR / VICE CHANCELLOR**

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**ADAMAS UNIVERSITY, KOLKATA**

**SCHOOL OF ENGINEERING & TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**VISION OF THE SCHOOL**

To develop well-grounded, socially responsible engineers and technocrats in a way to create a transformative impact on Indian society through continual innovation in education, research, creativity and entrepreneurship.

**MISSION STATEMENTS OF THE SCHOOL**

**M.S. 01:** Build a transformative educational experience through disciplinary and inter-disciplinary knowledge, problem solving, and communication and leadership skills.

**M.S. 02:** Develop a collaborative environment open to the free exchange of ideas, where research, creativity, innovation and entrepreneurship can flourish among individual students.

**M.S. 03:** Impact society in a transformative way – regionally and nationally - by engaging with partners outside the borders of the university campus.

**M.S. 04:** Promote outreach programs which strives to inculcate ethical standards and good character in the minds of young professionals.

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**DEAN / SCHOOL CONCERNED**

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**ADAMAS UNIVERSITY, KOLKATA**

**SCHOOL OF ENGINEERING & TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**VISION OF THE DEPARTMENT**

Graduates of the Department of Computer Science and Software Engineering will be recognized as innovative leaders in the fields of computer science and software engineering. This recognition will come from their work in software development in a myriad of application areas, as well as through their work in advanced study and research. The faculty is, and will continue to be, known for their passion for teaching and for their knowledge, expertise, and innovation in advancing the frontiers of knowledge in computer science and software engineering.

**MISSION STATEMENTS OF THE DEPARTMENT**

**M.S 01:** Our mission is to teach and prepare liberally educated, articulate, and skilled computer scientists and software engineers for leadership and professional careers and for advanced study.

**M.S 02:** A central objective of our program is to contribute to society by advancing the fields of computer science and software engineering through innovations in teaching and research, thus enhancing student knowledge through interactive instruction, global engagement, and experiential learning.

**M.S 03:** The program will serve as a resource to inform society about innovations related to the production and uses of computers and software.

**M.S 04:** To impart moral and ethical values, and interpersonal skills to the students.

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**HOD DEAN / SCHOOL CONCERNED**

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**ADAMAS UNIVERSITY, KOLKATA**

**SCHOOL OF ENGINEERING & TECHNOLOGY**

**Name of the Programme: Bachelor of Computer Application (BCA)**

**PROGRAMME EDUCATIONAL OBJECTIVES (PEO)**

**PEO 01:** Graduates would demonstrate analytical and design skills including the ability to generate creative solutions and foster team-oriented, professionalism through effective communication in their careers.

**PEO 02:** Graduates would expertise in successful careers based on their understanding of formal and practical methods of application development using the concept of computer programming languages and design principles in national and international level.

**PEO 03:** Graduates would pursue advanced education, research and development moreover other creative and innovative efforts in Computer Application, as well as other professional careers.

**PEO 04:** Graduates would implement their exhibiting critical thinking and problem solving skills in professional practices or tackle social, technical and business challenges.

**PEO 05:** Graduates would illustrate effective work conventionalities and be able to adapt as well as accept to the challenges of a dynamic job environment.

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**HOD DEAN / SCHOOL CONCERNED**

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

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**ADAMAS UNIVERSITY, KOLKATA**

**SCHOOL OF ENGINEERING & TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**Name of the Programme: Bachelor of Computer Application (BCA)**

**GRADUATE ATTRIBUTE / PROGRAMME OUTCOME (PO)**

**GA 1 / PO 1:** **Computational knowledge:** Acquire Knowledge of mathematical foundations, computer application theory and algorithm principles in the design and modelling of computer based system.

**GA 2 / PO 2:** **Design/development of solutions:** Avail appropriately system design notations and apply system design engineering process in order to design, plan, and implement software systems.

**GA 3 / PO 3:** **Conduct investigations of complex problems:** Implement document solutions to significant computational problems and apply mathematical and scientific reasoning to a variety of computational problems for the research in the computer application field.

**GA 4 / PO 4:** **Problem analysis:** Earn caliber to design, analyze and develop principles in the construction of complex hardware and software design computer systems.

**GA 5 / PO 5:** **The engineer and society:** Own Skills of observations and drawing logical inferences from the scientific experiments and develop application programs to meet the desired results including attainable constraints such as social, economic, environmental, functional, and technological.

**GA 6 / PO 6: Communication:** Assist and manage the execution of a productive project planning through effective communication among range of professional/non-professional audience.

**GA 7 / PO 7:** **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

**GA 8 / PO 8:** **Environment and sustainability:** Appraise regarding the social and environmental issues to fulfil the local and global needs and give relevant solutions for them.

**GA 9 / PO 9:** **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**GA 10 / PO 10:** **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**GA 11 / PO 11: Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one’s own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**GA 12 / PO 12:** **Life-long learning:** Understand and adopt emerging technologies, research, strategies for lifelong learning at national and international level.

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**HOD DEAN/SCHOOL CONCERNED**

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**ADAMAS UNIVERSITY, KOLKATA**

**SCHOOL OF ENGINEERING & TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**Name of the Programme: Bachelor of Computer Application (BCA)**

**PROGRAMME SPECIFIC OUTCOME (PSO)**

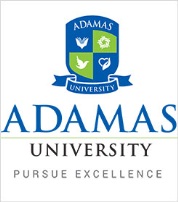
**PSO-1:** To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications.

**PSO-2:** To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors.

**PSO-3:** Analyze and synthesis computing systems through quantitative and qualitative techniques.

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**HOD DEAN / SCHOOL CONCERNED**

**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING**

**AND**

**TECHNOLOGY**

**DEPARTMANT OF COMPUTER SCIENCE**

**AND**

**ENGINEERING**

**Course Structure & Syllabus**

**Of**

**Bachelor of Computer Application (BCA) Programme**

**(W.e.f AY 2020 – 2021)**

**SoET 2.0 (Engineering+)**

|  |  |  |  |  |  |  |  |  |
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| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **UG PROGRAM: Bachelor of Computer Application (BCA)**  **SEMESTER I** | | | | | | | | |
| **Sl. No** | **Type of Course** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory | MTH11221 | Mathematics-I | 3 | 1 | 0 | 4 | 4 |
| 2 | Theory | CSE11401 | Introduction to Programming | 3 | 0 | 0 | 3 | 3 |
| 3 | Theory | ENG11055 | English Communication | 3 | 0 | 0 | 3 | 3 |
| 4 | Theory | CSE11402 | Computer Fundamentals | 3 | 0 | 0 | 3 | 3 |
| 5 | Theory | EVS11103 | Environmental Science | 3 | 0 | 0 | 3 | 3 |
| 6 | Practical | CSE12403 | Programming Lab | 0 | 0 | 3 | 3 | 2 |
| **Total** | | | | **15** | **1** | **3** | **19** | **18** |

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| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **UG PROGRAM: Bachelor of Computer Application (BCA)**  **SEMESTER II** | | | | | | | | |
| **Sl. No** | **Type of Course** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory | MTH11507 | Mathematics-II | 3 | 1 | 0 | 4 | 4 |
| 2 | Theory | CSE11404 | Programming & Data Structures | 3 | 0 | 0 | 3 | 3 |
| 3 | Theory | ECE11501 | Digital Electronics | 3 | 0 | 0 | 3 | 3 |
| 4 | Theory | CSE11405 | Design of Logic Circuits | 3 | 0 | 0 | 3 | 3 |
| 5 | Theory | CSE11406 | Web Designing | 3 | 0 | 0 | 3 | 3 |
| 6 | Practical | CSE12407 | Data Structures Lab | 0 | 0 | 3 | 3 | 2 |
| 7 | Practical | ECE12502 | Digital Electronics Lab | 0 | 0 | 3 | 3 | 2 |
| 8 | Practical | CSE12408 | Web Designing Lab | 0 | 0 | 3 | 3 | 2 |
| **Total** | | | | **15** | **1** | **9** | **25** | **22** |

**Total Credits (First Year): 40**

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| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **UG PROGRAM: Bachelor of Computer Application (BCA)**  **SEMESTER III** | | | | | | | | | |
| **Sl. No** | **Type of Course** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory | CSE11409 | Object Oriented Programming with JAVA | 3 | 0 | 0 | 3 | 3 |
| 2 | Theory | CSE11410 | Programming in Python | 3 | 0 | 0 | 3 | 3 |
| 3 | Theory | CSE11411 | Computer Organization & Architecture | 3 | 0 | 0 | 3 | 3 |
| 4 | Theory | CSE11412 | Database Management System | 3 | 0 | 0 | 3 | 3 |
| 5 | Practical | CSE12413 | Object Oriented Programming Lab | 0 | 0 | 3 | 3 | 2 |
| 6 | Practical | CSE12414 | Python Programming Lab | 0 | 0 | 3 | 3 | 2 |
| 7 | Practical | CSE12415 | Computer Organization Lab | 0 | 0 | 3 | 3 | 2 |
| 8 | Practical | CSE12416 | Database Management System Lab | 0 | 0 | 3 | 3 | 2 |
| **Total** | | | | **12** | **0** | **12** | **24** | **20** |

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| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **UG PROGRAM: Bachelor of Computer Application (BCA)**  **SEMESTER IV** | | | | | | | | |
| **Sl. No** | **Type of Course** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory | ECE11503 | Data Communication & Computer Network | 3 | 0 | 0 | 3 | 3 |
| 2 | Theory | CSE11417 | Algorithm Design | 3 | 0 | 0 | 3 | 3 |
| 3 | Theory | CSE11418 | Operating System | 3 | 0 | 0 | 3 | 3 |
| 4 | Theory | CSE11419 | Introduction to Computer Graphics | 3 | 0 | 0 | 3 | 3 |
| 5 | Practical | ECE12504 | Computer Network Lab | 0 | 0 | 3 | 3 | 2 |
| 6 | Practical | CSE12420 | Algorithm Design Lab | 0 | 0 | 3 | 3 | 2 |
| 7 | Practical | CSE12421 | Operating System Lab | 0 | 0 | 3 | 3 | 2 |
| 8 | Practical | CSE12422 | Computer Graphics Lab | 0 | 0 | 3 | 3 | 2 |
| **Total** | | | | **12** | **0** | **12** | **24** | **20** |

**Total Credits (Second Year): 40**

|  |  |  |  |  |  |  |  |  |
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| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **UG PROGRAM: Bachelor of Computer Application (BCA)**  **SEMESTER V** | | | | | | | | |
| **Sl. No** | **Type of Course** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory | FAC11403 | Financial Accounting | 3 | 0 | 0 | 3 | 3 |
| 2 | Theory | IST11401 | Management Information System | 3 | 0 | 0 | 3 | 3 |
| 3 | Theory | CSE11423 | Artificial Intelligence | 3 | 0 | 0 | 3 | 3 |
| 4 | Theory | CSE11424 | Software Engineering | 3 | 0 | 0 | 3 | 3 |
| 5 | Theory | CSE11425 | Business Communication | 3 | 0 | 0 | 3 | 3 |
| 6 | Practical | CSE12426 | Artificial Intelligence Lab | 0 | 0 | 3 | 3 | 2 |
| 7 | Practical | CSE12427 | Software Engineering Lab | 0 | 0 | 3 | 3 | 2 |
| 8 | Project | CSE14428 | Project-I | - | - | - | - | 4 |
| **Total** | | | | **15** | **0** | **06** | **21** | **23** |

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| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **UG PROGRAM: Bachelor of Computer Application (BCA)**  **SEMESTER VI** | | | | | | | | |
| **Sl. No** | **Type of Course** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory | MKT12403 | E-commerce & Applications | 3 | 0 | 0 | 3 | 3 |
| 2 | Theory | CSE11429 | Cyber Security | 3 | 0 | 0 | 3 | 3 |
| 3 | Viva | CSE15430 | Comprehensive Viva Voce | - | - | - | - | 3 |
| 4 | Project | CSE14431 | Project-II | - | - | - | - | 8 |
| **Total** | | | | **06** | **0** | **0** | **06** | **17** |

**Total Credits (Third Year): 40**

**Total Credits (Over Three Years):40 + 40 + 40 = 120**

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| --- | --- | --- | --- | --- | --- |
| **MTH11221** | Mathematics -I | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours –60** | **3** | **1** | **0** | **4** |
| **Pre-requisites/Exposure** | **12th level Mathematics** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To develop the fundamental concepts of set theory, differential calculus and its applications in real life problems
2. To understand the basics of linear algebra, different functional forms, and graphical presentation.
3. Build up the concept of fundamental knowledge ofintegral calculus and its applications in several areas.

**Course Outcomes**

On completion of this course, the students will be able to

1. **Explain** the basic idea of set theory and functions.
2. **Define** the different functional forms and show their graphical presentation.
3. **Utilize** the fundamental concepts of differential calculus to find the maximum/

minimum value of a function.

1. **Illustrate** the basic concept of integration and its applications to find areas

under the curves.

**Course Description:**

Knowledge of mathematics is pre-requisite to understand the modern theoretical as well as applied economics. This course is a review course to help students brush up their high school mathematics and getting a foothold of basic mathematical tools needed for the beginners. This course will help them to understand the basics of algebra, different functional forms, and graphical presentation. They will learn to evaluate limit, continuity and differentiation. It will continue to strengthen the basic knowledge of integration for students. The emphasis is on the understanding and developing the skill in the application of mathematical theorems and techniques in many disciplines.

**Course Content:**

**Module-I: [15 Lecture Hours]**

**Algebra of Set:** Mapping and Function, Sets, Subset, Power Set, Union, Intersection, Complement, Set Operations, Venn Diagram, Properties of Set, Laws of Algebra of Sets, Inclusion-Exclusion Principle. Mapping, Different types of Mapping with examples, Function and its properties.

**Module-II: [14 Lecture Hours]**

**Differential Calculus:** Limits of Function and Continuity, Fundamental Properties of Continuous Functions (without proof), geometric meaning of derivative and differential, rules of differentiation, Examples.

**Module -III: [16 Lecture Hours]**

**Differentiation:** Definition of Derivative, Rules of Differentiation (Without Proof), Derivatives of Algebraic, Trigonometric, Parametric, Logarithmic, Explicit / Implicit Functions, Second order Derivative with examples, Application: Maxima/Minima of Functions, and its applications.

**Module -IV: [15 Lecture Hours]**

**Integration and its application:** Definition of Integration, Standard Formulas, Method of Substitution, integration by parts, Partial fraction, Reduction Formulas (Without Proof), Area Bounded by the Curve (Excluding volume) and its applications

**Text Books:**

1. Grewal, B. S., Higher engineering mathematics, Khanna publishers
2. B. K. Pal and K. Das, BCA Mathematics (Volume - I), U. N. Dhur& Sons Publishers

**Reference Books:**

1. Shanti Narayan, “Differential Caluculs”, S.Chand& Company, 1998.
2. Shanti Narayan, P.K. Mittal, Integral Calculus, S.Chand& Company, 1999

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Explain**the basic idea of set theory and functions. | **PO1, PO2,PO9** |
| **CO2** | **Define** the different functional forms and show their graphical presentation. | **PO1,PO2,PO4,PO5** |
| **CO3** | **Utilize** the fundamental concepts of differential calculus to find the maximum/minimum value of a function. | **PO1, PO5,PO4, PO9,PSO1** |
| **CO4** | **Illustrate** the basic concept of integration and its applications to find areas under the curves. | **PO1, PO2,**  **PO9,PSO1** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| MTH11221 | Mathematics- I | 3 | 3 | - | 2 | 2 | - | - | - | 3 | - | - | - | 2 | - | - |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | | |
| Course: MTH11221 – Mathematics-I **Program: BCA Time: 03 Hrs. Semester: I Max. Marks: 50**  **Instructions:**  Attempt any three questions from **Section A** (each carrying 4 marks); any **Two Questions** from **Section B** (each carrying 10 marks)**. Section C** is Compulsory (carrying 8 marks)**.** | | | | |
| **Section A (**Attempt **any Three)** | | | | |
| 1. | Let U = {,-2,-1,0, 3, 5, 10, 12, 13, 16} be universal set and A = {-2, 3, 5, 12}, B = {-2, -1, 0, 5, 12, 13} be two subsets of U. **Show** that De-Morgan's Laws hold for the sets A and B. **(U)** | | **4** | **CO1** |
| 2. | If  then **show**that . (**R**) | | **4** | **CO2** |
| ­­­3. | **Use** parametric form of differentiation to find  if at .**(AP)** | | **4** | **CO3** |
| 4. | **Show** that. **(U)** | | **4** | **CO4** |
|  | **SECTION B (**Attempt any **Two Questions)** | |  | |
| 5. | **Utilize** MVT to prove if. When does the equality hold? | | **10** | **CO3** |
| 6. | a) **Show** that  **(U)**  b) **Apply** the optimum condition to Show that is minimum for . **(AP)** | | **5**  **5** | **CO4**  **CO3** |
| 7. | Given  .  **Utilize** the definition of limit to evaluate ,  and  **. (AP)** | | **10** | **CO3** |
|  | **SECTION C is Compulsory** | |  | |
| 8. | a) **Show** that a and b are the roots of equation    b) Using Venn-diagram **show**that .**(U)** | | **5**  **3** | **CO2**  **CO1** |

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| --- | --- | --- | --- | --- | --- |
| **CSE11401** | Introduction to Programming | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **H. Sc. level Computer Knowledge or Basic Computer Skills** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To **provide** students with understanding of code organization and functional hierarchical decomposition with using complex data types.
2. To **gain** a thorough understanding of the fundamentals of C programming
3. To **give** stress on fundamental parts of programming language, so that the students will have a basic concept for understanding and using other programming language.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Define** basics concepts of programming structure and implement the basics concepts of

programming.

CO2. **Solve** and execute various problems using programming language to choose the best

solution

CO3. **Apply** modularized solution and design such programs to appraise the solution

CO4. **Identify** the basic usage of memory and construct such memory in terms of array in

a program. Also, students be able to define user defined data types using structure and

union.

CO5. **Create** and manipulate permanent storage access through File Handling.

**Course Description:**

This course introduces basic concepts in programming language to solve numerical problems. All the lectures will be devoted on discussions of basic theories and advanced topics, focusing on practical implementation of knowledge. Classes will be conducted by lecture as well as power point presentation, audio visual virtual lab session. The tutorials will familiarize the students with practical problem-solving techniques led by the course coordinator. Students will strongly grab the basic concepts of the subject via exercise and discussions with the course coordinator.

**Course Content:**

**Unit-I 5 Lecture Hours**

**Basic Concepts of Programming:** Introduction to components of a Computer System (disks, memory, processor, where a program is stored and executed, operating systems, compilers, etc.), Idea of Algorithm: steps to solve logical and numerical problems, Representation of Algorithms: Flowchart/Pseudo code with examples, From Algorithms to Programs; source code, variables and memory locations, Syntax and Logical Errors in compilation, Object and Executable code.

**Unit-II 10 Lecture Hours**

**Basics of C Programming:** Characters used in C, Identifiers, Keywords, Data type & sizes, Constants & Variables, Various Operators used such as Arithmetic Operators, Relational & Logical Operators, Increment & Decrement Operators, Assignment Operators, Conditional or Ternary Operators, Bitwise Operators & Expressions; Standard Input & Output, formatted input scanf( ), formatted output printf( ); Flow of Control, if-else, switch-case, Loop Control Statements, for loop, while loop, do-while loop, nested loop, break, continue, goto, label and exit( ) function.

**Unit-III 10 Lecture Hours**

**Functions and Pointers:** Definition of Function, Declaration or Prototype of Function, Various types of Functions, Call by Value, Call by Reference, Recursion, Tail Recursion, Definition of Pointer, Declaration of Pointer, Operators used in Pointer, Pointer Arithmetic, Functions with Pointer.

**Unit-IV 10 Lecture Hours**

**Arrays and String:** Definition, Single and Multidimensional Arrays, Representation of Arrays - Row Major Order, and Column Major Order, Application of arrays – searching and sorting, Sparse Matrices and their representations. Definition of a String, Declaration of a String, Initialization of a String, Various String Handling Functions with example

**Unit-V 5 Lecture Hours**

**Structures and Unions:** Definition of a Structure, Declaration of a Structure & Structure Variable, Initialization of a Structure, Operators used in Structure, Structure within Structures, Union, Difference between a Structure and a Union.

**Unit-V 5 Lecture Hours**

**Files:** Types of File, File Processing, Handling Characters, Handling Integers, Random File Accessing, Errors During File Processing.

**Text Books:**

1. “The Complete Reference”, 4th Edition by Herbert Schildt, Tata Mcgraw Hill Education
2. “Programming In ANSI C” by E. Balagurusamy , Tata McGraw - Hill Education, New Delhi

**Reference Books:**

1. “The C Programming Language”, 2nd Edition, Brian W. Kernighan, Dennis M. Ritchie, PHI
2. “Schaum's Outline of Programming with C”, 2nd Edition, Byron S. Gottfried, Mcgraw Hill Education

**Modes of Examination: Assignment/Quiz/Project/Presentation/Written Exam**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) with Program Outcomes (POs) and Program Specific Outcomes (PSOs)**

**Mapping between COs, POs and PSOs**

|  |  |  |
| --- | --- | --- |
| **Course Outcomes (COs)** | | **Mapped POs and PSOs** |
| **CO-1** | **Define** basics concepts of programming structure and implement the basics concepts of programming. | **PO1, PO2** |
| **CO-2** | **Solve** and execute various problems using programming language to choose the best solution | **PO1, PO4, PSO1** |
| **CO-3** | **Apply** modularized solution and design such programs to appraise the solution | **PO1, PO2, PO3, PSO1** |
| **CO-4** | **Identify** the basic usage of memory and construct such memory in terms of array in a program. Also, students be able to define user defined data types using structure and union. | **PO2, PO3, PO4,PSO1** |
| **CO-5** | **Create** and manipulate permanent storage access through File Handling. | **PO1, PO2, PSO1** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE11401 | Introduction to Programming | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | 3 | - | - |

1=weakly mapped 2= moderately mapped 3=strongly mapped

**Model Question Paper**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | |
| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING AND TECHNOLOGY**  **END-SEMESTER EXAMINATION**  **Name of the Program: BCA Semester: I**  **Code- CSE11401 Stream- CSE**  **Time: 03 Hrs.**  **Paper title– Introduction to Programming Total pages- 2**  **Max. Marks: 50 Total no. of questions- 12**  **Instructions:**  Attempt All Questions from **Section A** (Each Carrying 1 Marks); any **Three Questions** from **Section B** (Each Carrying 5 Marks). **Any Two Questions from Section C** (Each Carrying 10 Marks).  **1. At top of sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam.**  **2. Assumptions made if any, should be stated clearly at the beginning of your answer.**  **3. All parts of a Question should be answered consecutively.** | | | |
| **Section A (**Answer **All the Questions) (5 x 1 = 5)** | | | |
| 1. | **What** will be the output?  int main()  {  int a = 10, b = 25;  a = b++ + a++;  b = ++b + ++a;  printf("%d %d \n", a, b);  } | **R** | **CO1** |
| 2. | **What** will be the output?  { int i = 0;  do  {  i++;  if (i == 2)  continue;  printf("In while loop ");  } while (i < 2);  printf("%d\n", i);  } | **R** | **CO2** |
| ­­­3. | **Classify** break keyword | **U** | **CO2** |
| 4. | **What** is call is by value function calling? | **R** | **CO3** |
| 5. | **Define** Structure | **R** | **CO4** |
| **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** | | | |
| 6. | **Solve** the addition of n numbers using for loop. | **AP** | **CO1** |
| 7. | **Compare** the difference between = and == symbols in C language. | **U** | **CO2** |
| 8. | **Find** the key features of C programming language. | **U** | **CO3** |
| 9. | **List** the difference between call by value and call by reference method with a help of example. | **U** | **CO4** |
| **SECTION C (**Attempt Any **Two Questions) (2 x 10 = 20)** | | | |
| 10. | **Solve** a program in C to read the file and store lines into an array. | **AP** | **CO5** |
| 11. | **What** is the description of Syntax error?  **Solve** the following pattern using C language:  1  1 2  1 2 3  1 2 3 4 | **R**  **AP** | **CO2**  **CO3** |
| 12. | **Solve** a C program which takes input from user and show the data types of user given input. | **AP** | **CO2** |

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| **ENG11055** | English Communication | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **12th level English** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To know the importance and techniques of communication skills in order to improve professional skills
2. To enhance the knowledge of the students on vocabulary, syntax, and grammatical skills
3. To improve writing skills by applying writing techniques, tools in practice sessions
4. To achieve an overall enhancement in terms of reading, listening and speaking

**Course Outcomes:**

On completion of this course, the students will be able to

1. **Explain** a basic understanding of communication processes and to know the practical implications and its challenges at the workplace
2. **Choose** grammar correctly and unambiguously
3. **Compare** formats of business communication like reports, letters, and other technical writings
4. **Improve** competence in speaking, reading, listening,and writing in English.
5. **Build** English pronunciation and use neutral accent successfully
6. **Build** different other accents of spoken English

**Catalog Description:**

English Communication is one of the basic requirements of a successful career. Both verbal and nonverbal communication is important to exchange ideas among the employees within the organization and outside the organization as well. In this course, the focus will be on improving LSRW skills, i.e. listening, speaking, reading and writing. Students will learn how to communicate effectively through prescribed syllabus. Classroom activities will be designed to encourage students to play an active role in the construction of their own knowledge and in the design of their own learning strategies. We will combine traditional lectures with other active teaching methodologies, such as group discussions, role play, small skit enactments, analysis of video scenes and debates. Class participation is a fundamental aspect of this course. Students will be encouraged to actively take part in all group activities and to give an oral group presentation. Students will be expected to interact with media resources, such as, web sites, videos, DVDs, and newspapers etc.

**Course Content**

**Module I: 9lecture hours**

**Communication Level 1**: Basics of Communication, Means of Communication, Barriers of Communication

**Module II: 9 lecture hours**

**Grammar and Syntax Level 1**:Tense: types and uses, Idioms, One Word Substitutes, Discussion on the use of Articles and related exercises, Discussion on the use of Prepositions and related exercises, Exercises on Sentence –Making (Syntax), Practice exercises on Voice change, Class Exercises on Synonyms and Antonyms.

**Module III: 9 lecture hours**

**Reading and Listening Skills Level 1**: Introduction to listening skills: purposes and practice, Discussion on types of listening: difference between listening and hearing, Active listening: introduction listening exercises, Elementary level listening exercise, Intermediate level listening exercise, Advance level listening exercise, Introduction to Reading Skills, Strategies of reading, Skimming, Scanning and Summarizing, Comprehension exercises.

**Module IV: 9 lecture hours**

**Speaking Skills Level 1**: Introduction to Speaking Skills: Mother tongue influence, Discussion on various kinds of narrative styles and techniques: Welcome speech, Vote of Thanks, Farewell Speech, Debate and Elocution, Class Exercises on Descriptive narration, Practical Exercises on Narration styles, Presentation of small skits, Practicing Extempore in the class, Mock practices of Group discussion, Practicing speaking in pairs, Mock practice of job interviews.

**Module V: 9 lecture Hours**

**Writing Skills Level 1**: Business letters: definition, types and format, Practice exercises, Business reports: definition, types and format, Practice exercises, CV and Application letters: types and formats, Practice exercises, Compositions: Essays, precisparagraph writing

**Text Books:**

1. Kaul Asha. Effective Business Communication. PHI Learning Pvt Ltd. 2014.
2. Wren and Martin. High School Grammar And Composition. S. Chand, 1995.
3. Gupta, A. English Reading Comprehension. Ramesh Publishing House, 2009.

**Reference Book:**

1. Lewis, Norman. Word Power Made Easy. Anchor: 2014.
2. Riordan, Daniel G & Pauley Steven A. :Technical Report Writing Today. 2004.
3. Hamp-Lyons and Heasely, B . Study Writing; A Course in Written English. For Academic and Professional Purposes, Cambridge Univ. Press, 2006.
4. Quirk R., Greenbaum S., Leech G., and Svartik, J. A Comprehensive Grammar of the English language, Longman:London, 1985.
5. Balasubramaniam, T. A Textbook of English Phonetics for Indian Students. Macmillan: 2012.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Explain** a basic understanding of communication processes and to know the practical implications and its challenges at the workplace | **PO11, PSO3** |
| **CO2** | **Choose** grammar correctly and unambiguously | **PO11, PSO3** |
| **CO3** | **Compare** formats of business communication like reports, letters, and other technical writings | **PO11, PO8** |
| **CO4** | **Improve** competence in speaking, reading, listening, and writing in English. | **PO5, PO6, PO11,PO8** |
| **CO5** | **Build** English pronunciation and use neutral accent successfully | **PO5, PO6** |
| **CO6** | **Build** different other accents of spoken English | **PO5, PO6, PO11,PO8** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ENG11055 | ENGLISH COMMUNICATION | - | - | - | - | 3 | 3 | - | 2 | - | - | 3 | - | - | - | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | | |
| Course: ENG11055 – English Communication **Program: BCA Semester: I**  **Time: 03 hrs. Max. Marks:50**  **Instructions:**  Attempt all questions from **Group A** (each carrying 1 mark); any **Three Questions** from **Group B** (each carrying 5 marks)**; any Two questions fromGroup C** (each carrying 10 marks)**.** | | | | | |
| **Group A (Answer all the questions) (5×1=5)** | | | | | |
| 1.  2.  3.  4.  5. | **Where** were you \_\_\_ 28 February, 2019? (Fill in the blank with appropriate preposition)**(R)**  **What** is non-verbal communication?**(R)**  **Name** one word substitute for: “One who loves books”**(R)**  **What** is the antonym of “Happiness”?**(R)**  **Recall** an example of an idiom.**(R)** | | **[1]**  **[1]**  **[1]**  **[1]**  **[1]** | **CO1**  **CO2** | |
|  | **Group B (**Attempt any **Three Questions) (3×5=15)** | |  |  | |
| 6. | **What** are the barriers to communication? Explain some physical and psychological barriers of communication. **(R)** | | **[5]** | **CO1** | |
| 7. | **What** do you understand by communication? Write a note on the importance of effective communication.**(R)** | | **[5]** | **CO1** | |
| 8. | Fill in the blanks using suitable article. Please copy the sentences given, while answering:   * 1. He was \_\_\_\_ first man to arrive.   2. Would you like to be \_\_\_\_\_\_ teacher?   3. I am going to buy \_\_\_\_\_\_ hat.   4. Picasso was \_\_\_\_ famous painter.   5. The Ganga is \_\_\_\_ sacred river. | | **[5]** | **CO2** | |
| 9. | Change the following sentences from active to passive voice:   * 1. The cat killed a mouse   2. People lined the road   3. He was singing a song yesterday   4. I have read this book.   5. Who broke the jug? | | **[5]** | **CO2** | |
|  | **GroupC (**Attempt any **Two Questions) (2×10=20)** | |  | | |
| 10. | **Write** a paragraph on the impact of COVID 19 in our society.**(R)** | | **[10]** | **CO3** | |
| 11. | **Write** an application to the Vice-Chancellor of your University as the class representative of your respective class requesting permission to organize a science exhibition in your department. **(R)** | | **[10]** | **CO3** | |
| 12. | **Read** the following passage and answer the questions that follow.  A few countries already use powerful electromagnets to build high speed trains. These trains are called maglev trains. Maglev is the shortened form of magnetic levitation. Maglev trains work on the principles of magnetism and float over a guideway.  The maglev train is different from a conventional train in that it does not have an engine. At least it does not have the kind of engines that pull train cars along steel tracks. It does not consume fossil fuels either.  Since maglev trains float in the air, there is no friction between the train and the track. This lack of friction and the aerodynamic design of these trains allow them to reach speeds of over 500 kilometer per hour.  Japan and Germany pioneer research in the maglev train technology. They have already built their prototypes and are in the process of testing them. Transrapid is an electromagnetic suspension system developed by German engineers. The idea of maglev transportation has been in existence for over a century. The first commercial maglev train made its debut in Shanghai, China in 2002. This train was developed by a German company. Right now the Shanghai Transrapid line connects Longyang Road station and Pudong airport. China is planning to extend this line to Hangzhou by building a 99 miles guideway.  Several other countries are also planning to build their own maglev train system, but right now the Shanghai maglev train is the only commercial maglev line.  Complete the sentences: (2×5=10)  (a) The two main differences between maglev trains and conventional trains are: …………………………….., ……………………………………..  (b) Maglev trains are environment friendly because ………………………  (c) The two nations that lead the research in maglev train technology are ……………………………..  (d) The two factors that help maglev trains to achieve high speeds are …………………………………….  (e) A suitable title for the passage would be ……………………………………………. | | **[10]** | **CO4**  **CO5**  **CO6** | |
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| **CSE11402** | Computer Fundamentals | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **H. Sc. level Computer Knowledge or Basic Computer Skills** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To **give** students an in-depth understanding of why computers are essential components in business, education and society.
2. To **introduce** the fundamentals of computing devices and reinforce computer vocabulary, particularly with respect to personal use of computer hardware and software.
3. To **explain** the representation of data and information in computer systems, use standard word, and spreadsheets, graphics generation packages, and standard database system.
4. To **provide** foundational or “computer literacy” curriculum that prepares students for life-long learning of computer concepts and skills.

**Course Outcomes**

On completion of this course, the students will be able to

CO1. **Recall** the fundamental concepts of computers with the present level of knowledge of the

students.

CO2. **Interpret** programming languages, peripheral devices, networking, multimedia and

internet

CO3. **Interpret** number systems and their arithmetic with the help of various LOGIC gate.

CO4. **Interpret** how logic circuits and Boolean algebra forms as the basics of digital computer.

CO5. **Demonstrate** the use of Operating system commands and shell script

**Course Description:**

This course introduces basic concepts in computer fundamental to understand the basic utilise of computer in our daily problems. All the lectures will be devoted on discussions of basic theories and advanced topics, focusing on practical implementation of knowledge. Classes will be conducted by lecture as well as power point presentation, audio visual virtual lab session. The tutorials will familiarize the students with practical problem-solving techniques led by the course coordinator. Students will strongly grab the basic concepts of the subject via exercise and discussions with the course coordinator.

**Course Content:**

**Unit-I 10 Lecture Hours**

**Introduction to Computers:** Basic Concept, Different types of computer, Characteristics of Computer, Block Diagram of Computer, classification of Computer: Mini, Micro, Main-Frame and Super Computers, Types of Programming Languages: Machine Languages, Assembly Languages and High Level Languages.

**Unit-II 8 Lecture Hours**

**Number Systems And Logic Gates**: Basic Concept, Number Systems, Conversions, Arithmetic System, Signed and Unsigned Numbers, Binary Addition, subtraction, multiplication and division, Logic Gates, Boolean Algebra, Combination of Logic Gates.

**Unit-III 9 Lecture Hours**

**Data Organization and Memories:** Data Organization: Drives, Files and Directories, Types of Memories: RAM ROM, PROM, EPROM, and Secondary Memories: Floppies, Hard Disc, Pen drives, CD; I/O Devices: Scanners, Digitizers, LCD, Optical Input Devices etc.

Hard Drive Performance: Average Access Time, Data Transfer Rate, Optimizing Disk Performance, Disk Cleanup, Defragmentation, File Compression, Drive Interface.

**Unit-IV 8 Lecture Hours**

**Computer Organization:** Central processing unit; Machine Cycles; Volatile and Non-Volatile Memory, Flash Memory. Factors affecting Processing Speed, Registers, Memory and Computing Power, Clock. Buses- Data Bus, Address Bus and control Bus. Cache Memory.

**Unit-V 10 Lecture Hours**

**Operating Systems**: Need of Operating System, Types of Operating System, User Interface- Command Line and Graphical user Interface, Hardware Management: Device Drivers, Interrupts Processing, and Utility Software.

Features of Different Operating System: DOS, Windows NT, Windows 9X, Windows 2000 Professional, Windows XP, The Macintosh Operating System, UNIX, LINUX

**Text Books:**

1. Peter Nortons -Introduction to Computers, Sixth Edition, Published by Tata McGraw Hill.

**Reference Books:**

1. Rajaraman V. – Fundamental of Computers, Prentice Hall of India Pvt. Ltd., New Delhi – 2nd edition, 1996.
2. Computer Fundamentals By P K Sinha & Priti Sinha Fourth Edition.

**Modes of Examination: Assignment/Quiz/Project/Presentation/Written Exam**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) with Program Outcomes (POs) and Program Specific Outcomes (PSOs)**

**Mapping between COs, POs and PSOs**

|  |  |  |
| --- | --- | --- |
| **Course Outcomes (COs)** | | **Mapped POs and PSOs** |
| **CO-1** | **Recall** the fundamental concepts of computers with the present level of knowledge of the students. | **PO1, PSO1** |
| **CO-2** | **Interpret** programming languages, peripheral devices, networking, multimedia and internet | **PO1,PO12,PO4** |
| **CO-3** | **Interpret** number systems and their arithmetic with the help of various LOGIC gate. | **PO4,PO12** |
| **CO-4** | **Interpret** how logic circuits and Boolean algebra forms as the basics of digital computer. | **PO1, PO2,PO12,PO4** |
| **CO-5** | **Demonstrate** the use of Operating system commands and shell script | **PO1,PSO1,PO12** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE11402 | Computer Fundamentals | 3 | 2 | - | 2 | - | - | - | - | - | - | - | 2 | 2 | - | - |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | |
| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING AND TECHNOLOGY**  **END-SEMESTER EXAMINATION**  **Name of the Program: BCA Semester: I**  **Code- CSE11402 Stream- CSE**  **Time: 03 Hrs.**  **Paper title– Computer Fundamentals Total pages- 2**  **Max. Marks: 50 Total no. of questions- 12**  **Instructions:**  Attempt All Questions from **Section A** (Each Carrying 1 Marks); any **Three Questions** from **Section B** (Each Carrying 5 Marks). **Any Two Questions from Section C** (Each Carrying 10 Marks).  **1. At top of sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam.**  **2. Assumptions made if any, should be stated clearly at the beginning of your answer.**  **3. All parts of a Question should be answered consecutively.** | | | |
| **Section A (**Answer **All the Questions) (5 x 1 = 5)** | | | |
| 1. | **What** is the difference between Hardware and Software? | **R** | **CO1** |
| 2. | **Recall** the name of 5 internal and external commands of DOS. | **R** | **CO5** |
| ­­­3. | **What** are storage devices? Explain with examples | **R** | **CO2** |
| 4. | **List** the difference between volatile and non-volatile memory. | **R** | **CO2** |
| 5. | **Explain** Basic gate | **U** | **CO3** |
| **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** | | | |
| 6. | **Explain** Defragmentation | **U** | **CO2** |
| 7. | **Define** X-OR gate with the help of truth table and diagram. | **R** | **CO3** |
| 8. | **What** is Memory? **Explain** types of Memory in brief. | **R, U** | **CO2** |
| 9. | **Illustrate** short note on-(I)Taskbar and (II)Toolbar | **U** | **CO5** |
| **SECTION C (**Attempt Any **Two Questions) (2 x 10 = 20)** | | | |
| 10. | **Solve** to simplify the following expression   1. A(A+)+B = AA+A+B 2. (*A+B*)(*+B*)*=* (*A+B*)(*+B*) | **AP** | **CO3** |
| 11. | **Solve** how to make a 2-input NAND out of 2-input NORs | **AP** | **CO3** |
| 12. | **What** is operating system? **Define** the needs of operating system. | **R** | **CO5** |

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| **EVS11103** | Environmental Science | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basic physics, chemistry, mathematics of +2 level.** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To understand the intrinsic relation between humans and environment, our position in the ecosystem around us
2. To comprehend the significance of the biodiversity surrounding us.
3. To figure out the importance and need for energy resources, various sources of energy, renewable and non-renewable sources, conventional and unconventional sources.
4. To have basic concepts about sustainability, our dependence on nature and the consequences of overexploitation.
5. To enable students to appreciate the importance and how much we owe to the earth systems for our survival.
6. To have a basic concept about the types of pollution and mitigation procedures.
7. To have an overall idea about the environmental legal framework in our country and about the EIA and environmental audit procedures.

**Course Outcomes:**

On completion of this course, the students will be able to

|  |
| --- |
| 1. **Distinguish** between various types of ecosystems, ecosystem dynamics,   perceive and appreciate the surrounding nature.   1. **Evaluate** the intrinsic relation between humans and environment, our   position in the ecosystem around us, and importance of biodiversity.   1. **Illustrate** the presence of various pollutants, their significance, and impacts,   and develop the underlying concepts involved in various air pollution  prevention and mitigation measures.   1. **Relate** the basic science which can explain the phenomena occurring around   us.   1. **Develop** the in-depth knowledge about natural resources including energy   resource.   1. **Understand** the legal framework in our country for safeguarding the   environment including pollution prevention, control, management, and  wildlife management. |

**Catalog Description:**

To distinguish between various types of ecosystems, ecosystem dynamics, perceive and appreciate the surrounding nature and feel connected, develop the concept of innate relationship of humans and biodiversity, need for conservation and different conservation strategies. The students will be developed in a way so that they can spontaneously comprehend the importance of studying about the various air pollutants, their significance and impacts, and develop the underlying concepts involved in various air pollution prevention and mitigation measures, understand fundamental water chemistry, deduce the relationship between various water pollutants, and understand the principles of various water and wastewater treatment procedures. They will understand the routes of generation, classification, management and environmental significance of solid waste, apply the basic concepts of waste management in their daily lives, understand the need of the 5Rs of waste management, importance of waste minimization.

**Course Content:**

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| **Module 1:**  **Introduction of environmental science:**Multidisciplinary nature of environmental studies; scope and importance; need for public awareness; concept of sustainability and sustainable development  **Natural Resources:** Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people, Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems, Energy resources: Fossil fuel, renewable source of energy: solar, wind power, hydroelectric, biomass, geothermal | | **[10]** |
|  |  | |
| **Module 2:**  **Environmental Pollution:** Types, causes, effects and controls; Air, water, soil and noise pollution, Nuclear hazards and human health risks, Pollution case studies | | **[10]** |
|  |  | |
| **Module 3:**  **Ecosystem and biodiversity:** Concept of an ecosystem, Structure and function of an ecosystem, Producers, consumers and decomposers, Food chains, food webs and ecological pyramids  Levels of Biodiversity: genetic, species and ecosystem diversity. Biogeographical classification of India, Values of biodiversity, India as a mega-diversity nation, Biodiversity hotspots, Threats to Biodiversity, In-situ and Ex-situ conservation of Biodiversity | | **[5]** |
|  |  | |
| **Module 4:**  **Waste minimization and cleaner technology:** Waste minimization techniques, Waste reuse, Waste recovery, Waste recycling, Establishing a waste minimization program, benefits and limitations of waste minimization, cleaner technology | | **[10]** |
|  |  | |
| **Module 5:**  **Global issues:** Global Warming, Ozone layer depletion, Acid rain  **Legal and regulatory actions for environmental protection:** The Wildlife (Protection) Act, 1972, Amendment 1991, The Water (Prevention and Control of Pollution) Act, 1974, The National Environment Appellate Authority Act, 1997, Water (Prevention and Control of Pollution) Cess Act, 1977, The Forest (Conservation) Act, 1980, The Air (Prevention and Control of Pollution) Act, 1981, The Environment (Protection) Act, 1986.  International convention and protocols | | **[10]** |

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| **Text Books:** | |
| **1.** | “Principles of Environmental Science”, 4th edition by Cunningham, W.P. and Cunningham, M.A. (2002), Tata McGraw-Hill Publishing Company, New Delhi |
| **2.** | Principles of Environmental Science, by K. Saravanan, S. Ramachandrana and R.Bhaskar, New Age international Pvt. Ltd, New Delhi |
| **Reference Books:** | |
| **1.** | Environmental Science, by Santra S.C. (2011), New Central Book Agency |
| **2.** | Rajagopalan R. (2015), Environmental Studies: From Crisis to Cure, Oxford University Press |
| **3.** | “Introduction to Environmental Engineering and Science”, by Masters, G.M., Prentice Hall of India, Second Indian Reprint. |

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Distinguish** between various types of ecosystems, ecosystem dynamics, perceive and appreciate the surrounding nature. | **PO3, PO4, PO5, PO7, PO9, PSO3** |
| **CO2** | **Evaluate** the intrinsic relation between humans and environment, our position in the ecosystem around us, and importance of biodiversity. | **PO3, PO4, PO5, PO7, PO9, PSO3** |
| **CO3** | **Illustrate** the presence of various pollutants, their significance, and impacts, and develop the underlying concepts involved in various air pollution prevention and mitigation measures. | **PO3, PO4, PO5, PO7, PO9, PO8,PSO3** |
| **CO4** | **Relate** the basic science which can explain the phenomena occurring around us. | **PO3, PO4, PO5, PO7, PO9, PO8, PSO3** |
| **CO5** | **Develop** the in-depth knowledge about natural resources including energy resource. | **PO3, PO4, PO5, PO7, PO9, PO8, PSO2** |
| **CO6** | **Relate** the legal framework in our country for safeguarding the environment including pollution prevention, control, management, and wildlife management. | **PO3, PO4, PO5, PO7, PO9, PSO2** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| EVS11103 | Environmental science | - | - | 3 | 3 | 3 | - | 3 | 2 | 3 | - | - | - | - | 2 | 3 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2021**

Name of the Program: BCA Semester I Stream: CSE

PAPER TITLE: Environmental Science PAPER CODE: EVS11103

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 02

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | Briefly **evaluate** what information about any ecosystem are conveyed by ecological pyramids? | **U** | **CO1** |
| 2. | **Analyse** how DO of a water body is related to eutrophication? | **U** | **CO3** |
| ­­­ 3. | **What** are the diverse applications of solar energy unlike other renewable energy resources? | **R** | **CO4** |
| 4. | **What** are the different types of wind turbine? | **R** | **CO4** |
| 5. | **List** few problems associated with large dams. | **R** | **CO2** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **What** are the adverse effects of open dumping of municipal solid wastes on environment? **How** does sanitary landfill differ from open dumping? (2.5+2.5 = 5) . | **U** | **CO5** |
| 7. | **What** is electrostatic precipitator? **What** are the advantages of electrostatic precipitator? (2.5+2.5 = 5) | **U** | **CO3** |
| 8. | **Describe** the distribution of water resources. | **R** | **CO5** |
| 9. | **Draw** a simple flowchart describing the steps that are followed in an EIA process in India. | **R** | **CO6** |
|  | **SECTION C (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **How** is photochemical smog formed? **What** are effects of photochemical smog? **Discuss** the factors affecting photochemical smog? (4+3+3=10) | **U** | **CO4** |
| 11. | **What** do you mean by BOD of water? **How** thermal pollution of water is linked to DO? A city discharges 1.25 m3/s of wastewater into a stream whose minimum rate of flow is 8.0 m3/s. The velocity of the stream is about 3.0 km/h. The temperature of the wastewater is 20°C and that of the stream is 15°C. The 20°C BOD5 of the wastewater is 250 mg/l and that of the stream is 2 mg/L. The wastewater contains no dissolved oxygen, but the stream is flowing with saturated DO concentration of 9.2 mg/L. Saturated DO at 15°C is 10.2 mg/L. At 20°C, deoxygenation constant (k1) is estimated to be 0.3 per day and reaeration constant (k2) is 0.7 per day. Determine the critical oxygen deficit and its location. Also estimate the 20°C BOD5 of a sample taken at the critical point. Use the temperature coefficients of 1.135 for k1 and 1.024 for k2. ( (2+2+6=10) | **Ap** | **CO3** |
| 12. | **What** is hazardous waste? Discuss the methods of hazardous waste management? What is composting? (2+6+2=10) | **An** | **CO3** |

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| --- | --- | --- | --- | --- | --- |
| **CSE12403** | Programming Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hour -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Knowledge of C Programming Language.** | | | | |
| **Co-requisites** |  | | | | |

**Course Objectives:**

1. To **introduce** students to the basic knowledge of programming fundamentals of C language.
2. To **impart** writing skill of C programming to the students and solving problems.
3. To **impart** the concepts like looping, array, functions, pointers, file, structure.

**Course Outcomes**:

On completion of this course, the students will be able to

CO1. **Interpret** various Unix commands.

CO2. **Plan** how to Write, Compile and Debug program in C language

CO3. **Solve** programs connecting decision structure and loops

CO4. **Utilize** user defined functions to solve real time problems

CO5. **Develop** C programs using Pointers to access arrays, strings, functions, structures & files.

CO6. **Utilize** the knowledge of utilization of computer programming in numerical techniques solutions.

**Course Description:**

This course introduces basic concepts in programming language to solve numerical problems.

All the lectures will be devoted on discussions of basic theories and advanced topics, focusing on practical implementation of knowledge. Classes will be conducted by lecture as well as power point presentation, audio visual virtual lab session. The tutorials will familiarize the students with practical problem-solving techniques led by the course coordinator. Students will strongly grab the basic concepts of the subject via exercise and discussions with the course coordinator.

**Course Content:**

**Experiment 1:**

To be familiar with syntax and structure of C- programming and learn problem solving techniques using C language.

**Experiment 2:**

Implement different data types, Operators and Expressions in C.

**Experiment 3:**

Implement the knowledge using Decision Statements (if, if-else,if-else-if ladder, switch and GOTO)

**Experiment 4:**

Familiarize and usage of Loop& nested loop Statements (for,while, do-while)

**Experiment 5:**Implement C program using different dimensions of Array.

**Experiment 6:**

Understand and develop function programming, its types and function-call.

**Experiment 7:**

Implement C programming with Pointer, String and Function call by reference.

**Experiment 8:**

Implement C programming with Structure.

**Experiment 9:**

Implement the concept of data files and file handling in C

**Modes of Examination: Assignment/Quiz/Project/Presentation/Written Exam**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) with Program Outcomes (POs) and Program Specific Outcomes (PSOs)**

**Mapping between COs, POs and PSOs**

|  |  |  |
| --- | --- | --- |
| **Course Outcomes (COs)** | | **Mapped POs and PSOs** |
| **CO-1** | **Interpret** various Unix commands. | **PO1** |
| **CO-2** | **Plan** how to Write, Compile and Debug program in C language | **PO1, PO2, PO4, PSO1** |
| **CO-3** | **Solve** programs connecting decision structure and loops | **PO1, PO2, PO3, PO4, PSO1** |
| **CO-4** | **Utilize** user defined functions to solve real time problems | **PO2, PO4, PSO1,PO7** |
| **CO-5** | **Develop** C programs using Pointers to access arrays, strings, functions, structures & files. | **PO1, PO2, PO4, PO7,PSO1** |
| **CO-6** | **Utilize** the knowledge of utilization of computer programming in numerical techniques solutions. | **PO1, PO3, PSO1,PO7** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE12403 | Programming Lab | 3 | 3 | 2 | 3 | - | - | 2 | - | - | - | - | - | 3 | - | - |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: I Stream: CSE

PAPER TITLE: Programming Lab

PAPER CODE: CSE12403

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 5 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 8 = 40)** | | | |
| 1. | Write to program to **Show** how comment can be implemented to make your programs readable. | **U** | **CO2** |
| 2. | **Build** a program to generate Fibonacci series. | **AP** | **CO3** |
| ­­­ 3. | **Develop** a program to display the following pattern.  \*  \* \*  \* \* \*  \* \* \* \*  \* \* \* \* \* | **AP** | **CO3** |
| 4. | **Find** a procedure to calculate sum of digits of the number using Recursive Function. | **R** | **CO4** |
| 5. | **Solve** a C Program to count number of lines in a file | **AP** | **CO5** |

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| **MTH11507** | Mathematics -II | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -60** | **3** | **1** | **0** | **4** |
| **Pre-requisites/Exposure** | **Class 12 Mathematics &Mathematics-I** | | | | |
| **Co-requisites** | **----** | | | | |

**Course Objectives:**

1. To develop the fundamental concepts of complex variables and related terms.
2. To understand the basics of linear algebra and its applications to solve system of equations.
3. To solve the differential equations using various analytical methods.
4. To build the basic concept of line and circle using co-ordinate geometry.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1: **Recall** the concept of a complex number with its essential properties and learn to perform simple algebra on complex numbers.

CO2: **Define** the various terms related to a matrix, determinant, rank, eigen value and eigen vectors, and their important properties.

CO3: **Apply** the different methods of determinant and matrix theory to obtain the inverse of a matrix and the solution of a system of linear equations.

CO4: **Summarize** the methods to get the solution of differential equations of first and second order.

CO5: **Explain** the general form of a straight line and circle with the knowledge of various basic terms in co-ordinate Geometry.

**Course Description:**

This is an important course to acquire knowledge of mathematical foundations to be used in computer application theory, build sophisticated algorithms and other applications in related fields. Also, this course skills the students to find solutions of simple problems. This course deals with complex numbers and its algebra in Argand plan, matrix theory, rank, determinants, system of equations, ordinary differential equations of first and second orders, basic co-ordinates geometry: lines and circle. The classes will be conducted by lecture as well as power point presentation, audio-visual session as per requirement. The tutorials will familiarize the students with practical problem-solving techniques guided by the course coordinator. Students will strongly grab the basic concepts of the subject via exercise and discussions with the coordinator.

**Course Content:**

**Module 1:** **lecture hours -12**

**Complex Numbers:** Definition, Representation of Complex Numbers, Argand plane, Sum, subtraction, product and division of complex numbers, Magnitude, argument and square root of complex numbers.

**Module 2: lecture hours -18**

**Matrices:** Determinant and its properties, Matrices, Addition and Multiplication of Matrices, Inverse Matrix, Solution of Linear Equations in three variables by Cramer’s Rule, Rank and Inverse of Matrices by Elementary Transformation, System of Linear Equations, Solution by Matrix Inversion Method, Eigen Values & Eigen Vectors, Caley-Hamilton Theorem and related Problems.

**Module 3:** **lecture hours -18**

**Ordinary Differential Equations:** Introduction to differential equation, Order / Degree of differential equations, solution of first order ordinary differential equations, Linear differential equation, solution of second order differential equation using operator method and its applications.

**Module 4:** **lecture hours -12**

**Co-ordinate Geometry:** Rectangular axes, distance formulae, section formulae, shifting of origin, slope of a line and angle between two lines, various forms of equations of a line, parallel to axes, point-slope form, slope-intercept form, two-point form, intercepts form and normal form, general equation of a line, circle, related problems.

**Text Books:**

1. Grewal, B. S., Higher engineering mathematics, Khanna publishers.

**Reference Books:**

1. Dr. D. C. Sancheti & V. K. Kapoor, Business Mathematics by. S.Chand & Sons Publications**.**

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Recall** the concept of a complex number with its essential properties and learn to perform simple algebra on complex numbers. | **PO1, PO2,PO9** |
| **CO2** | **Define** the various terms related to a matrix, determinant, rank, eigen value and eigen vectors, and their important properties. | **PO1,PO2,PO9,PSO2,PO12** |
| **CO3** | **Apply** the different methods of determinant and matrix theory to obtain the inverse of a matrix and the solution of a system of linear equations. | **PO1, PO9,PO12,PSO2** |
| **CO4** | **Summaries** the methods to get the solution of differential equations of first and second order. | **PO1, PO2,**  **PO9,PSO2,PO12** |
| **CO5** | **Explain** the general form of a straight line and circle with the knowledge of various basic terms in co-ordinate Geometry. | **PO1,PO2,PO9,PSO2,PO12** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| MTH11507 | Mathematics- II | 3 | 3 | - | - | - | - | - | - | 3 | - | - | 2 | - | 3 | - |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | | |
| Course: MTH11507 – Mathematics -II **Program: BCA Time: 03 Hrs. Semester: II Max. Marks: 50**  **Instructions:**  Attempt any three questions from **Section A** (each carrying 4 marks); any **Two Questions** from **Section B** (each carrying 10 marks)**. Section C** is Compulsory (carrying 8 marks)**.** | | | | |
| **Section A (**Attempt **any Three)** | | | | |
| 1. | **i) Define** a complex number in argantpaln**. ii) What** is the magnitude of (4 + 3i)/(3 − 4i)?**What** is its polar angle? (R) | | **1+3** | **CO1** |
| 2. | **Find** the rank of the matrix:. (R) | | **4** | **CO2** |
| ­­­3. | **Illustrate** the solution of the differential equation . (U) | | **4** | **CO4** |
| 4. | **Find** the equation of the circle whose center (1,-4) and radius . (U) | | **4** | **CO5** |
|  | **Section B (**Attempt any**Two)** | |  | |
| 5. | a) If and be any two complex numbers, **show**that . ( R)  b) **Find**the region in the z-plane represented by . ( R)  c) Solve the equations 3x + y + 2z = 3, 2x - 3y - z = - 3, x + 2y + z = 4, using matrix inversion methods. (Ap) | | **5**  **5** | **CO1**  **CO3** |
| 6. | a)**Explain** the order and degree of the differential equation: , and hence find the solution. (U)  b) **Illustrate** the solution of. (U) | | **5**  **5** | **CO4**  **CO4** |
| 7. | a)**Find** the distance between the points A(–4, –3) and B(5, 7). (U)  b) If C(3, 6) is the midpoint of line interval AB and A has coordinates (–1, 1), **explain**the coordinates of B. (U)  c) **Find** the gradient and y-intercept of the line 2x+3y =6. (U) | | **3+3+4** | **CO5** |
|  | **SECTION C is Compulsory** | |  | |
| 8. | Verify Cayley-Hamilton theorem for the matrix and **apply**Cayley-Hamilton theorem to compute the inverse of A. Also express as a linear polynomial in A. (Ap) | | **10** | **CO3** |

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| **CSE11404** | Programming & Data Structures | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basic concept of programming** | | | | |
| **Co-requisites** | **----** | | | | |

**Course Objectives:**

To introduce the fundamental concept of data structures and to emphasize the importance of data structures in developing and implementing efficient algorithms. Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs.

**Course Outcomes**:

On completion of this course, the students will be able to

1. **Define** the concept of Dynamic memory management, data types, and algorithms.
2. **Illustrate** advantages and disadvantages of specific algorithms and data structures.
3. **Solve** bugs in program, recognize needed basic operations with data structures.
4. **Interpret** algorithms and data structures in terms of time and memory complexity of basic operations.
5. **Compare** the computational efficiency of the principal algorithms for sorting, searching, and hashing

**Catalog Description:**

Study of advanced programming topics focused on logical structures of data as well as the design, implementation and analysis of algorithms operating on these structures. Students will gain the fundamental concept of data structures and to emphasize the importance of data structures in developing and implementing efficient algorithms.

**Course Content:**

**Unit I: 09 lecture hours**

**Introduction:** Basic Terminologies: Elementary Data Organizations, Data Structure Operations: insertion, deletion, traversal etc.; Analysis of an Algorithm, Asymptotic Notations, Time-Space trade off.

**Arrays:** Array Definition; Different array operations; Algorithms for various operations and Complexity Analysis,

**Searching:** Linear Search and Binary Search Techniques and their complexity analysis.

**Unit II: 09 lecture hours**

**Stacks and Queues:** ADT Stack and its operations: Algorithms and their complexity analysis, Applications of Stacks: Expression Conversion and evaluation Drop off; Navigation; Range; Dual Stack – corresponding algorithms and complexity analysis. ADT queue, Types of Queue: Simple Queue, Circular Queue, Priority Queue; Operations on each types of Queues: Algorithms and their analysis.

**Unit III: 09 lecture hours**

**Linked Lists:** Singly linked lists: Representation in memory, Algorithms of several operations: Traversing, Searching, Insertion into, Deletion from linked list; Linked representation of Stack and Queue, Doubly linked list: operations on it and algorithmic analysis; Circular Linked Lists: Sentinel List all operations their algorithms and the complexity analysis.

**Unit IV: 09 lecture hours**

**Trees:** Basic Tree Terminologies, Different types of Trees: Binary Tree, Threaded Binary Tree, Binary Search Tree, AVL Tree; Tree operations on each of the trees and their algorithms with complexity analysis. Applications of Binary Trees. B Tree, B+ Tree: definitions, algorithms and analysis.

**Graph:** Basic Terminologies and Representations, Graph search and traversal algorithms and complexity analysis.

**Unit V: 09 lecture hours**

**Sorting and Hashing**: Objective and properties of different sorting algorithms: Selection Sort and Updated Selection Sort, Bubble Sort and Extended Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort; Performance and Comparison among all the methods, Hashing.

**Text Books:**

1. Fundamentals of Data Structures”, Illustrated Edition by Ellis Horowitz, SartajSahni and Computer Science Press.
2. “Introduction To Algorithms”, Thomas H.Cormen, Charles E Leiserson, Ronald L Rivest, Clifford Stein.

**Reference Books:**

1. “Algorithms, Data Structures, and Problem Solving with C++”, Illustrated Edition by Mark Allen Weiss, Addison-Wesley Publishing Company
2. “How to Solve it by Computer”, 2nd Impression by R. G. Dromey, Pearson Education

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Define** the concept of Dynamic memory management, data types, and algorithms. | **PO1, PO2, PO4, PSO1, PSO3** |
| **CO2** | **Illustrate** advantages and disadvantages of specific algorithms and data structures. | **PO2, PO4, PSO1,PO12** |
| **CO3** | **Solve** bugs in program, recognize needed basic operations with data structures. | **PO1, PO2,PSO1, PSO2,PO12** |
| **CO4** | **Interpret** algorithms and data structures in terms of time and memory complexity of basic operations. | **PO4, PSO1,PSO3,PO12** |
| **CO5** | **Compare** the computational efficiency of the principal algorithms for sorting, searching, and hashing. | **PO4, PSO1,PSO2, PSO3,PO12** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE11404 | Programming & Data Structures | 2 | 3 | - | 3 | - | - | - | - | - | - | - | 2 | 3 | 2 | 3 |

1=weakly mapped 2= moderately mapped 3=strongly mapped



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: II Stream: CSE

PAPER TITLE: Programming & Data Structures

PAPER CODE: CSE11404

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 02

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **What** are the characteristics of an Algorithm? | **R** | **CO1** |
| 2. | **What** are elementary data representation? Also explain classification of data structure. | **R** | **CO1** |
| ­­­ 3. | **What** are the type of complexities? | **R** | **CO4** |
| 4. | **What** will be the address of 5th element in a floating-point array representation? The array is specified as Percentage [16]. The base address of the array is 1058. | **R** | **CO1** |
| 5. | **Construct** an AVL tree with five arbitrary elements. | **Ap** | **CO2** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | a) **Explain** row major and column major representation of an array?  b) **Develop** an algorithm to delete element from a QUEUE. **[2 + 3]** | **U** | **CO1** |
| 7. | a) **What** is the difference between iteration and recursion? How dynamic runtime array can be created.  b) **Develop** an algorithm to convert and infix expression to its prefix expression. **[2 + 3]** | **R, Ap** | **CO1,**  **CO3** |
| 8. | a) **Define** Ø with suitable graph and example.  b) **Solve** the postfix expression 5 2 \* 3 4 + 5 2 \* \* + using stack. **[2 + 3]** | **R, Ap** | **CO4,**  **CO3** |
| 9. | **Prove** that for any nonempty binary tree, if n0 represent the number of leaf nodes and n2 be the number of nodes of degree 2, then n0 = n2 + 1. | **Eva** | **CO3** |
|  | **SECTION (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | i) **Build** a C function to implement pop operation in a stack by using an array.  ii) **Build** a C function to insert an element into a linear queue by using a singly linked list.  iii) **Find** an equivalent infix expression of the following postfix expression by using stack:  A B + C \* D E - - F G + ^ **[3 + 3 + 4]** | **Ap, Ap,**  **R** | **CO3** |
| 11. | i) **Construct** the binary tree whose in-order and pre-order traversal sequence of nodes are given below:  In-order: E A C K F H D B G  Pre-order: F A E K C D H G B    ii) **Build** a recursive C function to insert an element in a binary search tree.  iii**) Prove** that the number of odd degree vertices in a graph is always even. **[4 + 3 + 3]** | **Ap, Ap, Eva** | **CO3,CO4** |
| 12. | i) **Build** an AVL tree with the following keys in the order given below:  I, J, K, C, B, F, D, G, E  Clearly mention different rotations used and balance factor of each node.  ii) **Construct** a B-Tree of order 3 from the following lists of data items:  42, 12, 30, 32, 10, 16, 20, 22, 34, 36, 38, 14, 24, 28  **[5 + 5]** | **Ap, Ap** | **CO2, CO3** |

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| **ECE11501** | Digital Electronics | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **1.Basic concepts of number system (Decimal, Binary)**  **2.Basic knowledge of electronic circuits (working principle of Transistor)** | | | | |
| **Co-requisites** | **----** | | | | |

**Course Objectives:**

1. Explain the elements of digital system abstractions such as digital representations of information, digital logic, Boolean algebra, state elements and finite state machine (FSMs).

2. Construct simple digital systems based on these digital abstractions, using the "digital paradigm" including discrete sampled information.

3. Design and build a simple printed circuit assembly (PCA) that utilizes modern digital integrated circuits.

4. Improving the knowledge and laboratory skills of engineers to proactively anticipate problems and resolve them efficiently with best-practices.

5. Provide a learning platform for students to design, build and test hardware for an embedded application that utilizes a modern digital integrated circuit.

**Course Outcomes:**

On completion of this course, the students will be able to

**CO1. Compare** different type of codes and number systems which are used in digital communication and computer systems.

**CO2. Apply** the codes and number systems converting circuits and compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency.

**CO3. Apply** different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods.

**CO4. Build** different types of with and without memory element digital electronic circuits for particular operation, within the realm of economic, performance, efficiency, user friendly and environmental constraints.

**CO5. Apply** the fundamental knowledge of digital electronics to design different types of counters and shift registers in real world with different changing circumstances.

**Catalog Description:**

Digital Electronics is the study of electronic circuits that are used to process and control digital signals. In contrast to analog electronics, where information is represented by a continuously varying voltage, digital signals are represented by two discreet voltages or logic levels. This distinction allows for greater signal speed and storage capabilities and has revolutionized the world electronics. Digital electronics is the foundation of all modern electronic devices such as cellular phones, MP3 players, laptop computers, digital cameras, high definition televisions, etc. The major focus of the DE course is to expose students to the design process of combinational and sequential logic design, teamwork, communication methods, engineering standards, and technical documentation. Utilizing the activity-project-problem-based (APPB) teaching and learning pedagogy, students will analyze, design and build digital electronic circuits. While implementing these designs students will continually hone their interpersonal skills, creative abilities and understanding of the design process.

**Course Content:**

**Unit I: 10 lecture hours**

**Introduction to Number System & Logic Gates:**  Decimal Number System, Binary Number System, Octal Number System, Hexadecimal Number System, Conversion from One Number System to another, Conversion from one base to another, 1‟s Complement and 2‟s Complement.

Logic Gates: AND, OR, NOT, NAND, NOR, Exclusive-OR and Exclusive-NOR, Implementations of Logic Functions using gates, NAND-NOR implementations.

**Unit II: 8 lecture hours**

**Boolean Functions:** Demorgan’s Theorems, Simplification of Boolean Expression using Boolean Algebra, SOP & POS Forms, Realization of Boolean Expression using Gates, K-Maps, Simplification of Boolean Expression using K-Maps. Combinational Logic Circuits: Half Adder, Half Subtractor, Full Adder & Full subtractor.

**Unit III: 10 lecture hours**

**Combinational& Sequential Circuits:**  Multiplexers & De-multiplexers, Implementation of Boolean equations using Multiplexer and De-multiplexer, Encoders & Decoders. RS & JK Flip-Flops, D & T Flip-Flops, Triggering of flips, Applications of Flip-Flops.

**Unit IV: 10 lecture hours**

**Semiconductor Memories & Organization:** Introduction, Classification of memories: Programmable Read Only Memory, Erasable Programmable Read Only Memory, Electrically EPROM, EAPROM, RAM – RAM organization, Memory decoding and memory expansion, Static RAM Cell, Bipolar RAM cell, MOSFET RAM cell, Dynamic RAM cell, Introduction to Programmable Logic Devices.

**Unit V: 7 lecture hours**

**Registers & Counters:** Registers, Shift Registers, Design of Asynchronous Counters &Ripple Counters, Design of Synchronous Counters, Up-Down Counters, Encoders-Decoders

**Text Books:**

1. [M. Morris Mano](http://www.amazon.in/M.-Morris-Mano/e/B001ILKELA/ref=dp_byline_cont_book_1),  [Michael D. Ciletti](https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Michael+D.+Ciletti%22); “Digital Design”, 4th Edition , Pearson Prentice Hall , 2007.
2. Floyd & Jain; “Digital Fundamentals”,8th Edition, Pearson Education,2006.
3. S. Salivahanan and S. Arivazhagan; Digital Circuits and Design (Fourth Edition-2012); Vikas Publishing House

**Reference Books:**

1. Anand Kumar; "Digital Electronics"; PHI.
2. [Donald P Leach](http://www.amazon.in/s/ref=dp_byline_sr_book_1?ie=UTF8&field-author=Don+Leach&search-alias=stripbooks) , [Albert Malvino](http://www.amazon.in/s/ref=dp_byline_sr_book_2?ie=UTF8&field-author=Albert+Malvino&search-alias=stripbooks) ;“ Digital Principles and Applications”, Tata McGraw - Hill, New Delhi; Year: 2006; Edition: 6.
3. G. K Kharate; "Digital Electronics"; Oxford Higher Education
4. R.P Jain, “Modern Digital Electronics”, Tata McGraw - Hill, New Delhi, 4th edition
5. LEE, “Digital Circuits & Logic Design” –PHI
6. Maini. A.K., “Digital Electronics Principals, Devices and Applications”. Chichester, England.: Jonh Wiley & Sons Ltd.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Compare** different type of codes and number systems which are used in digital communication and computer systems. | **PO1, PO2, PSO3** |
| **CO2** | **Apply** the codes and number systems converting circuits and compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency. | **PO1, PO2, PO5, PO12, PSO2, PSO3** |
| **CO3** | **Apply** different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods. | **PO2, PO4, PO5, PSO3** |
| **CO4** | **Build** different types of with and without memory element digital electronic circuits for particular operation, within the realm of economic, performance, efficiency, user friendly and environmental constraints. | **PO2, PO4, PO5, PO12, PSO3** |
| **CO5** | **Apply** the fundamental knowledge of digital electronics to design different types of counters and shift registers in real world with different changing circumstances. | **PO1, PO2, PO4, PO5, PO12, PSO2, PSO3** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECE11501 | Digital Electronics | 3 | 3 | - | 2 | 3 | - | - | - | - | - | - | 3 | - | 2 | 3 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

|  |  |  |  |  |
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| **Name:**  **Enrolment No:** | |  | | |
| Course: ECE11501 – Digital Electronics **Program: BCA Stream: CSE Semester: II**  **Time: 03 hrs. Max. Marks:50**  **Instructions:**  Attempt **Five Questions** compulsory from **Section A** (each carrying 1 mark); any **Three Questions** from **Section B** (each carrying 5 marks)**, any Two Questions** from **Section C** (each carrying 10 marks)**.** | | | | | |
| **SECTION A (Compulsory)** | | | | | |
| **1. a)** | **What** are the differences between combinational & sequential logic? (R) | | **[1]** | **CO3** | |
| **b)** | **What** is the Excess 3 representation of decimal 59? (R) | | **[1]** | **CO1** | |
| **­c)** | The circuit of the given figure realizes the function… (U)  https://electronicspost.com/wp-content/uploads/2016/04/mcq5.png | | **[1]** | **CO2** | |
| **d)** | If the input to T-flipflop is 100 Hz signal, what is the final output of the three T-flipflops in cascade? (E) | | **[1]** | **CO3** | |
| **e)** | **Wha**t is the difference between Ring and Johnson Counter? (R) | | **[1]** | **CO5** | |
| **SECTION B (Answer any Three Questions)** | | | | | |
| **2.** | **a) Explain** the operation of T Flip flop with diagram and suitable characterisitic table. (Ap)  **b) Convert** the SR to D FF using its corresponding characteristics & excitation table. (An) | | **[5]** | **CO3** | |
| **3.** | **a)Build** a 4 to 1 Multiplexer by using the three-variable function given by  F (A, B, C) = ∑m (1,3,5,6) (An)  **b) How** does a JK flip flop differ from an SR flip flop in its operation? (An) | | **[5]** | **CO2** | |
| **4.** | **a) Show** the logic diagram of a full subtractor using half subtractors and explain its working with the help of a truth table.(U)  **b)**Simplify the following expression into sum of products using Karnaugh map  F (A, B, C, D) = ∑m (1,3,4,5,6,7,9,12,13) (An) | | **[5]** | **CO2 & CO1** | |
| **5.** | **a) List** the names of different types of programmable logic device (PLD). (R)  **b)** Realize the following expression using PROM: (An)  **c) What** are the differences between ROM & RAM? (R) | | **[5]** | **CO4** | |
| **6.** | **a)** A microprocessor uses RAM chips of 1024 ×1 capacity.  **(i) How** many chips will be required and how many address lines will be connected to  provide capacity of 1024 bytes.  **(ii) How** many chips will be required to obtain a memory of capacity of 16 K bytes. (E)  **b) Explain** the detection of Static hazards using K-map. (U) | | **[5]** | **CO4 & CO5** | |
|  | | | | | |
| **SECTION C (Answer any Two Questions)** | | | | | |
| **7.** | **a) Design** a 1-bit digital comparator circuit using its corresponding truth table. (U)  **b)** Implement the following function using a 3 line to 8-line decoder. (Ap)  S (A, B, C) = ∑m (1,2,4,7)  C (A, B, C) = ∑m (3,5,6,7)  **c) Design** and implement the circuit using 4-bit BCD to EXCESS-3 converter and simplify the expression using Karnaugh map. (U) | | **[10]** | **CO2** | |
| **8.** | **a) Explain** the data movement technique through **i)** SISO Shift Register **ii)** SIPO Shift Register (U)  **b) Build**and explain block diagram for 4-bit parallel adder. (R)  **c) Convert** the binary number 10110 to Gray code. (R) | | **[10]** | **CO3 & CO2** | |
| **9.** | **a) Explain** the operation of master slave J-K flip flop and show how the race around condition is eliminated in it. (An)  **b) Explain** the operation of NAND gate S-R Flip flop with diagram and suitable characterisitic table. (An) | | **[10]** | **CO3** | |
| **10.** | **a) Design** Mod-5 Asynchronous up counter using J-K flip flop. (C)  **b) List** the different conditions to check for determining the type of Decoder, number of AND gates and OR gates for realization of Boolean expression using PLDs. Realize the following set of logical expressions using ROM, PLA and PAL. (C) | | **[10]** | **CO3& CO4** | |

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| **CSE11405** | Design of Logic Circuits | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Digital Electronics** | | | | |
| **Co-requisites** | **----** | | | | |

**Course Objectives:**

1. To introduce an overview of logic families.
2. To develop students for building k-map.
3. To provide the students a detailed analysis of sequential circuit.
4. To introduce the students to formalize with ASM chart.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1**. Interpret** and construct the basic design principles of logic gate.

CO2**. Interpret** the different fabrication techniques used in Bipolar, CMOS and PLA.

CO3. **Formaliz**e with mealy and Moore machine.

CO4**. Construct** ROM design.

**Catalog Description:**

The world of electronics is a lot easier to understand if we start by dividing it into two distinct categories: the “analog” world and the “digital” world. The analog world generally refers to any natural phenomenon that varies its own properties over a period of time. Take the outside temperature, for example. We notice that it changes rather slowly throughout the day, and at any instant we can measure how hot or cold it really is by using a simple thermometer.

The same changing properties can be observed, measured, and recorded in other natural phenomenon such as barometric pressure, wind speed, solar radiation, etc. If you were to record and graph each of the above events over a 24 hour period, you would notice one similar characteristic: the physical properties of each phenomenon change over time.

**Course Content:**

**Unit I: 06 lecture hours**

**Switching Circuits:** Logic families: TTL, nMOS, CMOS, dynamic CMOS and pass transistor logic (PTL) circuits, inverters and other logic gates, area, power and delay characteristics, concepts of fan-in, fan-out and noise margin.

**Unit II: 12 lecture hours**

**Switching theory:** Switching algebra, logic gates, switching functions, truth tables and switching expressions, minimization of completely and incompletely specified switching functions, Karnaugh map and Quine-McCluskey method, multiple output minimization, representation and manipulation of functions using BDD's, two-level and multi-level logic circuit synthesis

**Unit III: 06 lecture hours**

**Combinational logic circuits:** Realization of Boolean functions using NAND/NOR gates, Decoders, multiplexers. logic design using ROMs, PLAs and FPGAs. Case studies, fault diagnosis of combinational circuits

**Unit IV: 15 lecture hours**

**Sequential circuits:** Clocks, flip-flops, latches, counters and shift registers, finite-state machine model, Mealy and Moore machines, synthesis of synchronous sequential circuits, Conversion of Mealy m/c to Moore m/c and vice-versa, minimization and state assignment, Incompletely specified m/c’s, asynchronous sequential circuit synthesis.

**Unit V: 06 lecture hours**

**ASM charts:** Representation of sequential circuits using ASM charts, synthesis of output and next state functions, data path control path partition-based design

**Text Books:**

1. H. Taub and D. Schilling, Digital Integrated Electronics, McGraw-Hill.
2. Z. Kohavi, Switching and Finite Automata Theory, Tata McGraw-Hill.
3. Randy H. Katz and Gaetano Borriello, Contemporary Logic Design, Prentice Hall of India

**Reference Books:**

1. Giovanni De Micheli, Synthesis and Optimization of Digital Circuits, Tata McGraw-Hill.

**Modes of Evaluation: Quiz/Assignment/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Interpret** and construct the basic design principles of logic gate. | **PO2,PO3,PO4,PSO1,PSO3** |
| **CO2** | **Interpret** the different fabrication techniques used in Bipolar, CMOS and PLA. | **PO2,PO3,PO4,PSO1,PSO3** |
| **CO3** | **Formalize** with mealy and Moore machine. | **PO2,PO3,PO4,PSO1,PSO3** |
| **CO4** | **Construct** ROM design. | **PO2,PO3,PO4,PSO1,PSO3** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE11405 | Design of Logic Circuit | - | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 3 | - | 3 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

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| **Name:**  **Enrolment No:** | |  | | |
| ADAMAS UNIVERSITYSCHOOL OF ENGINEERING AND TECHNOLOGYEND-SEMESTER EXAMINATIONName of the Program: BCA Semester: IICode- CSE11405 Stream- CSETime: 03 Hrs.Paper title– Design of Logic Circuit Total pages- 1Max. Marks: 50 Total no. of questions- 12Instructions:Attempt All Questions from Section A (Each Carrying 1 Marks); any Three Questions from Section B (Each Carrying 5 Marks). Any Two Questions from Section C (Each Carrying 10 Marks)1. At top of sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam.2. Assumptions made if any, should be stated clearly at the beginning of your answer. 3. **All parts of a Question should be answered consecutively** | | | | |
| **SECTION A (Answer All questions) (5 x 1 = 5)** | | | | |
| 1. | **List** the different logic gates? | | **U** | **CO3** |
| 2. | **Explain** switching algebra and switching function. | | **U** | **CO1** |
| ­­­ 3. | **Define** logic design using ROM? | | **R** | **CO2** |
| 4. | **Elucidate** the essential components of multi-level component of logic synthesis. | | **R** | **CO4** |
| 5. | **What** is ROM logic? | | **U** | **CO2** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** | |  | |
| 6. | **Describe** about mealy and Moore machine? | | **U** | **CO4** |
| 7. | **Examine** flip-flop and their use in real life? | | **Ap** | **CO2** |
| 8. | **Elucidate** the factors influencing on C-MOS delay. | | **Ap** | **CO3** |
| 9. | **Explain** in detail about bi-polar S-RAM cell transistor. | | **U** | **CO2** |
|  | **SECTION C (**Attempt any **Two Questions) (2 x 10 = 20)** | |  | |
| 10. | **Build** a synchronous Modulo-10 up/down counter using T FFs. | | **Ap** | **CO4** |
| 11. | **Explain** BCD to excess-3 code conversion in PLA. | | **U** | **CO4** |
| 12. | **Compare** between Karnaugh map and Quine- McCluskey method and write the advantage of K-map over the Quine-McCluskey method. | | **U** | **CO1** |

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| **CSE11406** | Web Designing | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Browser compatibility knowledge /HTML** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To help the pupils to develop an understanding of client /server model.
2. To enable students a precise understanding of web protocol.
3. To give the students a perspective of web design language for designing a web site.
4. To enable students design a structure of web page model for any organization.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Interpret** E- Mail, Telnet, FTP, E-Commerce, Video Conferencing, E-Business.

CO2. **Formalize** HTML Tag Reference, Global Attributes, Event Handlers, Document Structure.

CO3**. Classify** a detailed analysis of form, frame and CSS in HTML.

CO4. **Design** effectively a web page with HTML/JavaScript/XML style.

**Catalog Description:**

The methods by which computers communicate with each other through the use of markup languages and multimedia packages is known as web technology. In the past few decades, web technology has undergone a dramatic transition, from a few marked up web pages to the ability to do very specific work on a network without interruption. Let's look at some examples of web technology. Being a web developer gives you the power to create new cool things. If you can imagine it you can build it (or kind of). You don't need any kind of material - just your knowledge about web development.

**Course Content:**

**Unit I: 8 lecture hours**

**Internet And WWW:** Introduction, E- Mail, Telnet, FTP, E-Commerce, Video Conferencing, E-Business. Internet Service Providers, Domain Name Server, Internet Address, World Wide Web (WWW): World Wide Web And Its Evolution, Uniform Resource Locator (URL), Browsers - Internet Explorer, Netscape Navigator, Opera, Firefox, Chrome, Mozilla. Search Engine, Web Server - Apache, IIS, Proxy Server, HTTP Protocol. Case Study of E-Business website like (Myntra, Jabong, Amazon)

**Unit II: 17 lecture hours**

**Module 2:**

**HTML And Graphics:** HTML Tag Reference, Global Attributes, Event Handlers, Document Structure Tags, Formatting Tags, Text Level Formatting, Block Level Formatting, List Tags, Hyperlink Tags, Image And Image Maps, Table Tags, Form Tags, Frame Tags, Executable Content Tags.

**Image maps:** Introduction, Client-Side Image maps, Server-Side Image maps, Using Server-Side And Client-Side Image mapas Together, Alternative Text For Image maps, Tables : Introduction To HTML Tables And Their Structure, The Table Tags, Alignment, Aligning Entire Table, Alignment Within A Row, Alignment Within A Cell, Attributes, Content Summary, Background Colour, Adding A Caption, Setting The Width, Adding A Border, Spacing Within A Cell, Spacing Between The Cells, Spanning Multiple Rows Or Columns, Elements That Can Be Placed In A Table, Table Sections And Column Properties, Tables As A Design Tool.

**Frames:** Introduction To Frames, Applications, Frames Document, The Tag, Nesting Tag, Placing Content In Frames With The Tag, Targeting Named Frames, Creating Floating Frames, Using Hidden Frames,Frame analysis in Online Job portal.

**Forms:** Creating Forms, The<FORM>Top of Form

Tag, Named Input Fields, The <INPUT> Tag, Multiple Lines Text Windows, Drop Down And List Boxes, Hidden Text, Text Area, Password, File Upload, Button, Submit, Reset, Radio, Checkbox, Select, Option, Forms And Scripting, Action Buttons, Labelling Input Files, Grouping Related Fields, Disabled And Read-Only Fields, Form Field Event Handlers Passing **Form Data Style Sheets:**Introduction, Different Approaches To Style Sheets, Using Multiple Approaches, Linking To Style Information In Separate File, Setting Up Style Information, Using The <LINK>Tag, Embedded Style Information, Using <STYLE> Tag, Inline Style Information. Real life case study analysis of E-Ticket booking, with suitable linking of travel destination.

**Java Script:** Introduction, Client-Side Javascript, Server-Side Javascript, Javascript Objects, Javascript Security.

**Operators:** Assignment Operators, Comparison Operators, Arithmetic Operators, % (Modulus), ++ (Increment), -- (Decrement), -(Unary Negation), Logical Operators, Short-Circuit Evaluation, String Operators, Special Operators, ? (Conditional Operator), ,(Comma Operator), Delete, New, This, Void

**Statements:** Break, Comment, Continue, Delete, Do … While, Export, For, For…In, Function, If…Else, Import, Labelled, Return, Switch, Var, While, With,

**Core Javascript:** Array, Boolean, Date, Function, Math, Number, Object, String, Regexp

**Document And Its Associated Objects:**Document, Link, Area, Anchor, Image, Applet, Layer

**Unit III: 12 lecture hours**

**Java Script:** Introduction, Client-Side Javascript, Server-Side Javascript, Javascript Objects, Javascript Security.

**Operators:** Assignment Operators, Comparison Operators, Arithmetic Operators, % (Modulus), ++ (Increment), -- (Decrement), -(Unary Negation), Logical Operators, Short

**Java Script:** Introduction, Client-Side Javascript, Server-Side Javascript, Javascript Objects, Javascript Security.

**Operators:** Assignment Operators, Comparison Operators, Arithmetic Operators, % (Modulus), ++ (Increment), -- (Decrement), -(Unary Negation), Logical Operators, Short-Circuit Evaluation, String Operators, Special Operators, ? (Conditional Operator), ,(Comma Operator), Delete, New, This, Void

**Statements:** Break, Comment, Continue, Delete, Do … While, Export, For, For…In, Function, If…Else, Import, Labelled, Return, Switch, Var, While, With,

**Core Javascript:** Array, Boolean, Date, Function, Math, Number, Object, String, Regexp

**Document And Its Associated Objects:**Document, Link, Area, Anchor, Image, Applet, Layer

**Events And Event Handlers:** General Information About Events, Defining Event Handlers: Onabort, Onblur, Onchange, Onclick, Ondblclick, Ondragdrop, Onerror, Onfocus, Onkeydown, Onkeypress, Onkeyup, Onload, Onmousedown, Onmousemove, Onmouseout, Onmouseover, Onmouseup, Onmove, Onreset, Onresize, Onselect, Onsubmit, Onunload,Case study analysis of E-commerce website in transaction processing of client order .

**Unit IV: 8 lecture hours**

**XML:** Introduction, Anatomy, Document, Creating XML Documents, Creating XML Dtds, XML Schemas, XSL, Mapping of XML ontology for a web site.

**PHP:** Introduction, Server-Side Web Scripting, Installing PHP, Adding PHP To HTML, Syntax And Variables, Passing Information Between Pages, Strings, Arrays And Array Functions, Numbers, Basic PHP Errors / Problems

**Text Books:**

1. “Web Design The Complete Reference”, Thomas Powell, Tata Mcgrawhill

**Reference Books:**

1.“HTML And XHTML The Complete Reference”, Thomas Powell, Tata Mcgrawhill.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Interpret** E- Mail, Telnet, FTP, E-Commerce, Video Conferencing, E-Business. | **PO2,PO3,PO5,PO10,PSO2,PSO1** |
| **CO2** | **Formalize** HTML Tag Reference, Global Attributes, Event Handlers, Document Structure Tags. | **PO2,PO3,PO5,PO10,PSO2,PSO1,PO6** |
| **CO3** | **Classify** a detailed analysis of form, frame and CSS in HTML. | **PO2,PO3,PO5,PO12,PO4,PSO1,PSO2,PO6** |
| **CO4** | **Design** effectively a web page with HTML/JavaScript/XML style. | **PO12,PSO2,PSO1** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE11406 | Web Designing | - | 3 | 3 | - | 3 | 2 | - | - | - | 2 | - | 2 | 3 | 3 | - |

1=weakly mapped 2=moderately mapped 3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: II Stream: CSE

PAPER TITLE: Web Designing PAPER CODE: CSE11406

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **List** the steps involved in Architecture of of server with suitable example | **U** | **CO1** |
| 2. | **Enumerate** the basic elements of application layer protocol and their use in message communication. | **U** | **CO2** |
| ­­­ 3. | **Define**the Html tag for below example? | **R** | **CO3** |
| 4. | **What** is multicast DNS (mDNS),? | **R** | **CO4** |
| 5. | **Give** the the essential components of URL. | **U** | **CO3** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Describe** the characteristics of Java script arithmetic operator)?  . | **U** | **CO1** |
| 7. | **Examine** the frame with HTML tagC:\Users\User\Desktop\Capture.JPG | **U, Ap** | **CO1, CO2** |
| 8. | **Elucidate** the factors influencing Javascript security. | **Ap** | **CO3** |
| 9. | **Explain** with Example: i) FTP ii) DNS. | **Evaluate** | **CO4 /CO5** |
|  | **SECTION C(Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Explain** in detail about Table in HTML. | **U** | **CO4** |
| 11. | **Write** a list in HTML?with suitable example. | **Create** | **CO4** |
| 12. | **Distinguish**XML DTD by taking suitable example? | **Ap** | **CO5** |

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| **CSE12407** | Data Structures Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Basic concept of programming** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

The objective of the course is to teach programming (with an emphasis on problem solving) and introduce elementary data structures. The student should, at a rudimentary level, be able to prove correctness (loop invariants, conditioning, etc).

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Explain** asymptotic performance of the algorithms.

CO2**. Illustrate** Linear data structures and their applications such as Stacks, Queues and Linked Lists

CO3**. Solve** and understand Non-Linear Data Structures and their Applications such as Trees and Graphs

CO4. **Interpret** searching and sorting algorithms.

**Course Description:**

Data Structures (also called Data Structures and Algorithms in some places) is a core course in all computer science undergraduate curricula. The course is the basis for understanding several data structures and also algorithms that operate on them. The course forms the foundation for almost all computer science subjects: compilers, operating systems, databases, AI and software engineering.

**Course Content:**

**List of Programs:**

1. Write a menu based C program to insert a node at the beginning, after a specified position, at the end of a singly linked list.
2. Write a menu based C program to delete a node from the beginning, from a specified position, from the end of a singly linked list.
3. Write a menu based C program to display the data part of the nodes in reverse order, reverse the list and sort the elements of a singly linked list.
4. Write a menu based C program to insert a node at the beginning, after a specified position, at the end of a doubly linked list.
5. Write a menu based python program to delete a node from the beginning, from a specified position, from the end of a doubly linked list.
6. Write a menu based C program to display the data part of the nodes in reverse order, reverse the list and sort the elements of a doubly linked list.
7. Write a menu based C program to insert, delete and display operation of a linear queue by using singly linked list.
8. Write a menu based C program to insert, delete and display operation of a linear queue by using an array.
9. Write a menu based C program to implement push, pop and display operation of a linear queue by using singly linked list.
10. Write a menu based C program to implement push, pop and display operation of a linear queue by using an array.
11. Write a menu based C program to implement insert, delete and display operation of a circular queue by using an array.
12. Write a menu based C program to implement insert, delete and traverse operation of a binary search tree using doubly linked list.
13. Write a menu based C program to implement linear search, binary search and interpolation search algorithm.
14. Write a menu based C program to implement bubble sort, selection sort, and quick sort, merge sort, insertion sort, heap sort and radix sort algorithm.
15. Implement Tree Traversals, BFS, Graph Traversal, Shortest path and some topics on Spanning Tree using C.

**Text Books:**

1. “Fundamentals of Data Structures”, Illustrated Edition by Ellis Horowitz, SartajSahni and Computer Science Press.

2. “Introduction To Algorithms”, [Thomas H.Cormen](https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Thomas+H..+Cormen%22), [Thomas H Cormen](https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Thomas+H+Cormen%22), [Charles E Leiserson](https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Charles+E+Leiserson%22), [Ronald L Rivest](https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Ronald+L+Rivest%22), Clifford Stein.

**Reference Books:**

1. “Algorithms, Data Structures, and Problem Solving with C++”, Illustrated Edition by Mark Allen Weiss, Addison-Wesley Publishing Company.

2. “How to Solve it by Computer”, 2nd Impression by R. G. Dromey, Pearson Education.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO-1** | **Explain** asymptotic performance of the algorithms. | **PO1, PO3, PO4, PSO2, PSO3** |
| **CO-2** | **Illustrate** Linear data structures and their applications such as Stacks, Queues and Lists | **PO1, PO2, PO4, PSO1, PSO2, PSO3** |
| **CO-3** | **Solve**and understand Non-Linear Data Structures and their Applications such as Trees and Graphs | **PO1, PO2, PO4, PSO1, PSO2, PSO3** |
| **CO-4** | **Interpret** searching and sorting algorithms. | **PO1, PO2, PO3, PO4,PSO1, PSO2, PSO3** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE12407 | Data Structures Lab | 3 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 3 | 3 | 3 |

1=weakly mapped 2= moderately mapped 3=strongly mapped



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: II Stream: CSE

PAPER TITLE: Data Structures Lab

PAPER CODE: CSE12407

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 5 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 10 = 50)** | | | |
| 1. | **Develop** a C program to reverse a singly linked list. | **Ap** | **CO1** |
| 2. | **Develop** a C program to insert an element in a circular queue by using an array. | **Ap** | **CO1** |
| ­­­ 3. | **Develop** a C program to delete a node from a BST. | **Ap** | **CO3** |
| 4. | **Develop** a C program to insert an element in a stack by using a singly linked list. | **Ap** | **CO1** |
| 5. | **Develop** a C program to implement merge sort algorithm. | **Ap** | **CO4** |

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| **ECE12502** | Digital Electronics Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **1.Basic concepts of number system (Decimal, Binary)**  **2.Basic knowledge of electronic circuits**  **3.Basic Electrical & Electronics Engineering practices Lab** | | | | |
| **Co-requisites** | **Principle of Digital Electronics** | | | | |

**Course Objectives:**

1. To understand number representation and conversion between different representation in digital electronic circuits.
2. To analyze logic processes and implement logical operations using combinational logic circuits.
3. To understand concepts of sequential circuits and to analyze sequential systems in terms of state machines.
4. To understand characteristics of memory and their classification.
5. To evaluate the use of computer‐based analysis tools to review performance of various digital circuits.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Apply** a digital logic to solve real life problems.

CO2**. Define** various combinational logic circuits.

CO3. **Construct** sequential logic circuits such as counters, shift registers etc.

CO4. **Apply** different types of wiring and instruments connections keeping in mind technical, Economical, safety issues.

CO5. **Analyze** professional quality textual and graphical presentations of laboratory data and Computational results, incorporating accepted data analysis and synthesis methods, Mathematical software and word‐processing tools.

CO6**. Compare** possible causes of discrepancy in practical experimental observations to theory data.

**Catalog Description:**

Digital Electronics is the study of electronic circuits that are used to process and control digital signals. In contrast to analog electronics, where information is represented by a continuously varying voltage, digital signals are represented by two discreet voltages or logic levels. This distinction allows for greater signal speed and storage capabilities and has revolutionized the world electronics. Digital electronics is the foundation of all modern electronic devices such as cellular phones, MP3 players, laptop computers, digital cameras, high definition televisions, etc. The major focus of the DE course is to expose students to the design process of combinational and sequential logic design, teamwork, communication methods, engineering standards, and technical documentation.Utilizing the activity-project-problem-based (APPB) teaching and learning pedagogy, students will analyze, design and build digital electronic circuits. While implementing these designs students will continually hone their interpersonal skills, creative abilities and understanding of the design process.

**Course Content:**

**List of experiments:**

1. A. Study of Logic Gates

B. Study Universal Logic Gates

1. Study of Half Adder & Full Adder
2. Study of Half Subtractor & Full Subtractor
3. Design and Implementation of Binary to Gray&Gray to Binary Code Convertor
4. Design and Implementation of BCD to Excess-3 & Excess-3 to BCD Code Convertor
5. Design and Implementation of 1Bit & 2Bit Magnitude Comparator
6. Design and Implementation of 4:1 Multiplexer and 1:4 Demultiplexer
7. Design and Implementation of 4:2 Encoder and 2:4 Decoder
8. Verification of Characteristics Tables of S-R and D Flipflop Using Universal Gates
9. Verification of Characteristics Tables of J-K and T Flipflop Using Universal Gates
10. Design of 2-bit Asynchronous Counter Using Flip Flops
11. Design of 2-bit Synchronous Counter Using Flip Flops
12. Design and Implementation of SISO & SIPO Shift Registers using Flip Flops
13. Design and Implementation of PISO & PIPO Shift Registers using Flip Flops

**Text Books:**

1. [M. Morris Mano](http://www.amazon.in/M.-Morris-Mano/e/B001ILKELA/ref=dp_byline_cont_book_1),  [Michael D. Ciletti](https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Michael+D.+Ciletti%22); “Digital Design”, 4th Edition , Pearson Prentice Hall , 2007.

1. Floyd & Jain; “Digital Fundamentals”,8th Edition, Pearson Education,2006.
2. S. Salivahanan and S. Arivazhagan; Digital Circuits and Design (Fourth Edition-2012); Vikas Publishing House

**Reference Books:**

1. Anand Kumar; "Digital Electronics"; PHI.

2. Digital Fundamentals, Thomas L. Floyd, Pearson Education, ISBN:9788131734483

3. Digital Principles and Applications, Malvino and Leach, TMH

**E-Resources:**

1. <http://www.vlab.co.in/>
2. <http://www.asic-world.com/>

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Apply** a digital logic to solve real life problems. | **PO1, PO2, PO6, PSO3** |
| **CO2** | **Define** various combinational logic circuits. | **PO1, PO3, PO6, PSO3** |
| **CO3** | **Construct** sequential logic circuits such as counters, shift registers etc. | **PO1, PO3, PO6, PSO2, PSO3** |
| **CO4** | **Apply** different types of wiring and instruments connections keeping in mind technical, Economical, safety issues. | **PO1, PO3, PO6** |
| **CO5** | **Analyze** professional quality textual and graphical presentations of laboratory data and Computational results, incorporating accepted data analysis and synthesis methods, Mathematical software and word‐processing tools. | **PO1, PO3, PO6, PSO3** |
| **CO6** | **Compare** possible causes of discrepancy in practical experimental observations to theory data. | **PO1, PO2, PO6, PSO1, PSO3** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECE12502 | Digital Electronics Lab | 3 | 2 | 3 | - | - | 3 | - | - | - | 2 | - | - | 2 | 2 | 3 |

1=weakly mapped; 2= moderately mapped; 3=strongly mapped

**Model Question Paper**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | | | |
| Course: ECE12502 – Digital Electronics Lab **Program: BCA Stream: CSE Semester: II**  **Time: 03 hrs. Max. Marks: 50** | | | | |
| **Questions** | | | | |
| **1.** | **A)** Implement and verify the truth table of logic gates (AND, OR, NOT, EX-OR) using universal NAND gate. (R)  **B)** Simplify the following expression into sum of products using Karnaugh map F (A, B, C, D) = ∑m (1,3,4,6,7,12,13) + ∑d (2,8,11). Draw the simplified equation using logic gates. (An) | | **[50]** | **CO1+CO4+CO5+CO6** |
| **2.** | **A) Design** and implement the half subtractor and full adder circuit using logic gates and verify the truth table. (U)  **B)** Minimize the following logic function using K-maps and realize using NAND gates.  Y = ∏ (0, 1, 4, 5, 6, 8, 9, 12, 13, 14) (An) | | **[50]** | **CO2+CO4+CO5+CO6** |
| **­3.** | **A) Design** and implementation of 3 bit binary to gray and gray to binary converter circuit and verify the truth table. (U)  **B)** Simplify the given expression to its Sum of Products (SOP) form. Draw the logic circuit for the simplified SOP function; (C) | | **[50]** | **CO2+CO4+CO5+CO6** |
| **4.** | **A) Design** and implementation of 4-bit BCD to Excess 3 code converter circuit. Simplify the equation using Karnaugh map and verify the truth table. (U)  **B) What** do you mean by priority encoder? State the De-Morgan’s theorem. (R) | | **[50]** | **CO2+CO4+CO5+CO6** |
| **5.** | **A) Design** and verify the truth table of 4:2 encoder and 2:4 decoder circuit. (U)  **B) Design** 1-bit full adder using Multiplexer with K-Map. (An) | | **[50]** | **CO2+CO4+CO5+CO6** |
| **6.** | **A) Design** and verify the truth table of 4:1 multiplexer and 1:4 de-multiplexer circuit. (U)  **B)** Implementation of Boolean function F (A, B, C, D) **=** ∑m (1,4,5,7,9,12,13) using 4X1 MUX. (An) | | **[50]** | **CO2+CO4+CO5+CO6** |
| **7.** | **A) Design** and verify the characteristics table of S-R Flip Flop & D Flip Flop using Universal NAND Gate. (E)  **B)** Implement or design a 16:1 MUX using two 8:1 MUX (C) | | **[50]** | **CO3+CO4+CO5+CO6** |
| **8.** | **A) Design** and verify the characteristics table of J-K Flip Flop & T Flip Flop using Universal NAND Gate. (An)  **B) Design** a 3-bit asynchronous down counter using positive edge triggered and show the timing diagram. (An) | | **[50]** | **CO3+CO4+CO5+CO6** |
| **9.** | **A) Design**& verify the state table of MOD-4 asynchronous up counter using JK Flip Flop. (C)  **B) Explain** the need of counters. Write down the differences between synchronous and asynchronous counter. (U) | | **[50]** | **CO3+CO4+CO5+CO6** |
| **10.** | **A) Design**& verify the state table of MOD-4 synchronous up counter using JK Flip Flop. (C)  **B) Design** a 3-bit asynchronous up counter using negative edge triggered and show the timing diagram. (An) | | **[50]** | **CO3+CO4+CO5+CO6** |
| **11.** | **A) i)**Realization and implementation of 1-bit comparator and very the truth table. (U)  **ii) Design** and implement the half adder circuit using logic gates and verify the truth table. (U)  **B) Design** a 3-bit synchronous up counter using positive edge triggered and show the timing diagram. (An) | | **[50]** | **CO2+CO4+CO5+CO6** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CSE12408** | Web Designing Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Basic knowledge of Internet and HTML** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To help the behaviour study of web page element like, table, list, anchor and CSS.
2. To enable students, acquire knowledge in web page designing.
3. To give the students a perspective touser interface graphics and visualization techniques.
4. To enable students, acquire structure of web scripting and art of interface design.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1**. Interpret** the basic of web designing language.

CO2**. Comprehend** student the proper usage of HTML tag.

CO3**. Comprehend** student understanding in JavaScript event and PHP.

CO4. **Classify** Student knowledge effectively and analyse feature of web attributes like frame, form, and CSS.

**Catalog Description:**

Web Design Lab requires designers to create graphics, typography as well as images which are used only on the World Wide Web. While creating any design, web designers need to maintain balance between creating a good design as well as the speed and efficiency for the webpage/ website. Web Design is a specialisation of the web page creation.

The different areas in which a web designer can work include web graphic design, interface design, authoring, user experience design and the likes.

Most often individuals working in the web design field need to work closely with other members of their team. Web Design usually involves the design process that is related to the front-end of a website which includes writing mark up. A point to note here is that web design as a field is known to partially overlap with web engineering when the aspect of web development is considered.

Web designers use many tools in order to perform the tasks allotted to them. Web Designers are known to use both vector as well as raster graphics to create their design prototypes. They also use HTML, CSS, WYSIWYG editing software, mark up validators etc., to create design elements.

**Course Content:**

Suggested assignments to be framed based on the following Programming Language such as

HTML, CSS, Java script, XML and PHP.

1. Introduction to web page design, attributes and concept by taking an example of online job-portal.

2. Explain the logic of HTML and its feature, heading, color, background color, (h1 to h6).

3. Design a preliminary web page by using HTML table, create, row, header, data insertion.

4. Design a web page by using HTML form tag and explore its features by taking reference of some

E-commerce web site (Mantra , Zabong etc)

5. Design a web page by using HTML form attributes (Radio button, submit button, drop down menu, check box etc)in Online Ticket booking

6. Design a List in HTML (Ordered list and Un-ordered list).

7. Design a event page by using JavaScript in E-commerce website.

8-Design a web page by using JavaScript for arithmetic and logical operation.

9. Design a page enabling idea of Java string, Java switch, DOM model.By taking an online movie-ticket booking.

10. Design a web repository knowledge base by using XML-ontology.

11.Write a PHP class that sorts an ordered integer array with the help of [sort()](https://www.w3resource.com/php/function-reference/sort.php) function.

12.Write a PHP Calculator class which will accept two values as arguments, then add them, subtract them, multiply them together, or divide them on request.

**Text Books:**

1. Mishra. B, Sharma. S (2011) Communication Skills for Engineers and Scientists. PHI Learning Pvt. Ltd. ISBN: 8120337190.
2. Chaturvedi P. D, Chaturvedi M. (2011) Business Communication: Concepts, Cases and Applications. Pearson Education India. ISBN: 8131718727.
3. Greenbaum. Sidney. [College Grammar of English](http://www.amazon.com/College-Grammar-English-sidney-Greenbaum/dp/0582285976/ref=pd_rhf_ee_p_t_1). Longman Publishers. ISBN: 9780582285972.

**Reference Books:**

1. Pal, Rajendra and Korlahalli, J.S. (2011) Essentials of Business Communication. Sultan Chand & Sons. ISBN: 9788180547294.
2. Kaul, Asha. (2014) Effective Business Communication.PHI Learning Pvt. Ltd. ISBN: 9788120338487.
3. Murphy, R. (2007) Essential English Grammar, CUP. ISBN: 8175960299.
4. C. Muralikrishna and S. Mishra (2011) Communication Skills for Engineers, Pearson education. ISBN: 9788131733844.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Interpret** the basic of web designing language. | **PO1,PO2,PO3,PSO1,PSO2,PSO3,PO4** |
| **CO2** | **Comprehend** student the proper usage of HTML tag. | **PO1,PO2,PO3,PO4,PO7, PO12, PSO2** |
| **CO3** | **Comprehend** student understanding in JavaScript event and PHP. | **PO1,PO4,PO3,PO7, PO12,PSO2** |
| **CO4** | **Classify** Student knowledge effectively and analyse feature of web attributes like frame, form,and CSS. | **PO1,PO2,PO3,PO12,PO7** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE12408 | Web Designing Lab | 3 | 2 | 3 | 2 | - | - | 2 | - | - | - | - | 2 | 2 | 3 | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: II Stream: CSE

PAPER TITLE: Web Designing Lab PAPER CODE: CSE12408

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 2 = 10)** | | | |
| 1. | **List** the html tag to design the ordered and un-ordered list with suitable example given below,An unordered HTML list:   * Item1 * Item2 * Item3 * Item4   An ordered HTML list:   1. First item 2. Second item 3. Third item 4. Fourth item | **U** | **CO1** |
| 2. | **Enumerate** the basic elements of application layer protocol and their use in message communication. | **U** | **CO2** |
| ­­­ 3. | **Define** brief history of internet)? | **R** | **CO3** |
| 4. | **What** is multicast DNS (mDNS),? | **R** | **CO4** |
| 5. | **Give** the the essential components of URL. | **U** | **CO3** |
|  | **SECTION B (**Attempt any **Six Questions) (6 x 5 = 30)** |  | |
| 6. | **Describe** the characteristics of Java script arithmetic operator)?  . | **U** | **CO1** |
| 7. | **Examine** the frame with HTML tagC:\Users\User\Desktop\Capture.JPG | **U, Ap** | **CO1, CO2** |
| 8. | **Elucidate** the HTML tag for the table given below.**C:\Users\User\Desktop\Capture.JPG** | **Ap** | **CO3** |
| 9. | **Explain** with Example: i) JavaScript arithmetic operator (/,%,\*)with example ii) DNS. | **Ap** | **CO4 /CO5** |
| 10. | **Explain** in web repository knowledge base by using XML-ontology. | **U** | **CO4** |
| 11. | **Write** a list in HTML?with suitable example. | **R** | **CO4** |
| 12. | **Distinguish** the logic of HTML and its feature, heading, color, background color, (h1 to h6)by taking suitable example? | **U** | **CO5** |

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| --- | --- | --- | --- | --- | --- |
| **CSE11409** | Object Oriented Programming with JAVA | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basic concept of programming** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

Students will be motivated to solve the problems in engineering using the concepts of object-oriented programming.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Define** Abstraction in all forms and in a holistic way

CO2**. Illustrate** object oriented modelling techniques like classes and Instances modelling techniques

CO3**. Solve** programs using standard design patterns

CO4. **Interpret**fundamentals of object-oriented programming in Java, including defining

Classes, invoking methods, using class libraries, etc.

CO5. **Construct**programming solutions with exception handling and multi-threading concept

CO6. **Solve**GUI program with proper event handling techniques

**Catalog Description:**

This course investigates object-oriented methods including object-oriented programming methodologies and techniques. Current methodology is emphasized. The use of object-oriented features such as encapsulation, information hiding, inheritance and polymorphism is reinforced by class assignments and programming exercises. The importance of multi-threading and exception handling is introduced in this course.

**Course Content:**

**Unit I: 09 lecture hours**

**OOP Concepts -** Data Abstraction, Encapsulation, Inheritance, Benefits of Inheritance, Polymorphism, Classes and Objects, Procedural and OOP Paradigms. Introduction To Java, Data Types, Variables & Constants, Scope & Life Time Of Variables, Precedence Of Operator, Expressions, Type Casting, Enumerated Types, Block Scope, Control Flow, Conditional Statements, Loops, Break & Continue Statements, Arrays, Console Input/Output, Formatting Output, Constructors Methods, Parameter Passing, Static Fields & Methods, Access Control, “This” Reference, Method Overloading, Recursion, Garbage Collection, Building Strings, String Class.

**Unit II: 09 lecture hours**

**Inheritance -** Hierarchical Inheritance: Super And Sub Classes, Member Accessing Rules, Super Keyword, And Preventing Inheritance: Final Classes And Methods, Object Class And Its Methods.

**Polymorphism -** Dynamic Binding, Method Overriding, Abstract Classes and Methods

**Interfaces -** Interfaces and Abstract Classes, Definition, Implementation, Accessing Implementations by Interface References, Extending Interfaces.

**Inner Classes -** Usage, Local, Anonymous and Static Inner Classes, Examples.

**Packages -** Definition, Creation And Accessing A Package, Understanding CLASSPATH, Importing Packages.

**Unit III: 09 lecture hours**

**Exception Handling -** Dealing With Errors, Advantages Of Exception Handling, The Classification - Exception Hierarchy, Checked And Unchecked Exceptions, Try, Catch, Throw, Throws And Finally, Exceptions-Throwing, Exception Specification, Built In Exceptions, Creating Exception Sub Classes.

**Multithreading -** Difference Between Multiple Processes And Multiple Threads, Thread States, Creating And Interrupting Threads, Thread Priorities, Synchronizing Threads, Inter-Thread Communication, Procedure Consumer Pattern.

**Unit IV: 09 lecture hours**

**Collection Framework -** Introduction, Generics and Common Use Of Collection Classes, Array List, Vector, Hash Table, Stack, Enumeration, Iterator, String Tokenizer, Random, Scanner, Calendars And Properties.

**Files -** Streams - Byte Streams, Character Streams, Text Input/Output, Binary Input/Output, Random Access of File Operations, File Management.

**Connecting To Database –** JDBC / ODBC Type 1 To 4 Drivers, Connection And Handling Databases With JDBC.

**Unit V: 09 lecture hours**

**GUI Programming -**The AWT Class Hierarchy, Introduction To Swing, Swing Vs, AWT, Hierarchy Of Swing Components, Containers - Jframe, Japplet, Jdialog, Jpanel, Overview Of Swing Components: Jbutton, Jlabel, Jtextfield, Jtextarea, Swing Applications, Layout Management - Types - Border, Grid And Flow

**Event Handling -** Events, Sources, Classes, Listeners, Event Sources And Listeners, Delegation Event Model, Examples. Handling Mouse Events, Adapter Classes.

**Applets -** Inheritance Hierarchy For Applets, Differences Between Applets And Applications, Life Cycle, Passing Parameters To Applets, Applet Security Issues.

**Text Books:**

1. “Java Fundamentals - A Comprehensive Introduction”, Illustrated Edition By Daleskrien, Herbert Schildt, Mcgraw-Hill Education.

**Reference Books:**

1. “Java For Programmers”, 2nd Edition By Paul Deitel And Harvey Deitel, Pearson Education.

1. “Thinking In Java”, Low Price Edition By Bruce Eckel, Pearson Education

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO-1** | **Define** Abstraction in all forms and in a holistic way | **PO1, PSO1** |
| **CO-2** | **Illustrate** object oriented modelling techniques like classes and Instances modelling techniques | **PO1, PO2, PO4, PSO1, PS03** |
| **CO-3** | **Solve** programs using standard design patterns | **PO1, PO2, PO4, PSO1, PS04** |
| **CO-4** | **Interpret** fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc. | **PO1, PO4, PSO1** |
| **CO-5** | **Construct**programming solutions with exception handling and multi-threading concept | **PO1, PO2, PO4, PSO1, PSO3, PSO4** |
| **CO-6** | **Solve**GUI program with proper event handling techniques | **PO1, PO2, PO4, PSO1, PSO3, PSO4** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE11409 | Object Oriented Programming with JAVA | 3 | 3 | - | 3 | - | - | - | - | - | - | - | - | 3 | 3 | 3 |

1=weakly mapped 2= moderately mapped 3=strongly mapped



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: III Stream: CSE

PAPER TITLE: Object Oriented Programming with JAVA PAPER CODE: CSE11409

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 02

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

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| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **What** is the difference between suspending and stopping a thread? | **R** | **CO5** |
| 2. | **Compare** between init ( ) and start ( ) methods? | **U** | **CO4** |
| ­­­ 3. | **Name** some of the most common types of exceptions that might occur in java. | **R** | **CO5** |
| 4. | **Tell** the name of various sections of a web page. | **R** | **CO6** |
| 5. | **Explain** the arguments used in the method drawRoundRect ( ). | **U** | **CO6** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | a) **Define** constructor with a suitable example.  b) **Develop** a java program to implement the concept of nesting of methods. **[2 + 3]** | **R, Ap** | **CO3, CO4** |
|  |  |  |  |
| 7. | a) **What** is method overloading?  b) **Develop** a java program to implement the concept of method overloading. **[2 + 3]** | **R, Ap** | **CO3, CO4** |
| 8. | a) **What** is multiple inheritance?  b) **Develop** a java program to implement the concept of multiple inheritance. **[2 + 3]** | **R, Ap** | **CO3, CO4** |
| 9. | a) **What** do you mean by exception handling mechanism?  b) **Develop** a java program to implement the concept of method overriding. **[2 + 3]** | **R, Ap** | **CO3, CO4** |
|  | **SECTION (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | i) **Define** an exception called “NoMatchException” that is thrown when a string is not equal to “India”. Write a java program that uses this exception.  ii) **Why** do applet classes need to be declared as public.  iii) **Illustrate** the different stages in the life cycle of a thread with a suitable block diagram. **[4 + 2 + 4]** | **R, U** | **CO1, CO5,CO6** |
| 11. | i) **Illustrate** the three ways of drawing polygons.  ii) **Build** an applet to draw a circle inside a square.  iii) **Explain** the three different ways by which a running thread may relinquish its control to another thread. **[3 + 4 + 3]** | **U, Ap** | **CO5,CO6** |
| 12. | i) **Develop** a java program to use the yield ( ), stop ( ) and sleep ( ) methods of a thread.  ii) **Build** an applet that receives three numeric values as input from the user and then displays the sum and average of the three on the screen. Write a HTML page and test the applet. **[4 + 6]** | **Ap** | **CO5, CO6** |

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| **CSE11410** | Programming in Python | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **H. Sc. level Computer Knowledge or Basic Computer Skills** | | | | |
| **Co-requisites** | **-** | | | | |

**Course Objectives:**

1. To **provide** an introduction to the Python programming language.
2. To **introduce** students with an introduction to programming, I/O, and visualization using the Python programming language.
3. To **develop** Python programming for software engineers, system analysts, program managers and user support personnel who wish to learn the Python programming language.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Classify** the fundamental Python syntax and semantics and show the use of Python control flow statements.

CO2. **Demonstrate** the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples, sets and strings.

CO3. **Develop** proficiency in the handling of functions.

CO4. **Identify** the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism

as used in Python.

CO5. **Find** the commonly used operations to handle run time error or Exception

CO6. **Summarize** how to handle large data file with the help of various file handling methods.

**Catalog Description:**

The goal of this course is to provide an introduction to Python. The course will discuss topics necessary for the participant to be able to create and execute Python programs. The lectures and presentations are designed to provide knowledge and experiences to students that serve as a foundation for continued learning of presented areas.

Upon the successful completion of this course, the student will be able to:

* Install and run the Python interpreter
* Create and execute Python programs
* Understand the concepts of file I/O
* Read data from a text file using Python
* Acquire knowledge about Object Oriented Skills in Python

All the lectures will be devoted on discussions of basic theories and advanced topics, focusing on practical implementation of knowledge. Classes will be conducted by lecture as well as power point presentation, as per requirement. The tutorials will familiarize the students with practical problem-solving techniques led by the course coordinator. Students will strongly grab the basic concepts of the subject via exercise and discussions with the coordinator.

**Course Content:**

**Unit-I 12 Lecture Hours**

**Introduction to Python:** Introduction to Python, Python variables, expressions, statements, Variables, Keywords, Operators & operands, Expressions, Statements, Order of operations, String operations, Comments, Keyboard input, Example programs, Functions- Type conversion function, Math functions, Composition of functions, Defining own function, parameters, arguments, Importing functions, Example programs

**Unit II: 8 Lecture Hours**

**Conditions & Iterations: Conditions-** Modulus operator, Boolean expression, Logical operators, if, ifelse, if-elif-else, Nested conditions, Example programs,

**Iteration-** while, for, break, continue, Nested loop, Example programs

**Unit III: 13 Lecture Hours**

**Recursion, Strings, List, Dictionaries, Tuples: Recursion-** Python recursion, Examples of recursive functions, Recursion error, Advantages & disadvantages of recursion

**Strings-** Accessing values in string, Updating strings, Slicing strings, String methods – upper(), find(), lower(), capitalize(), count(), join(), len(), isalnum(), isalpha(), isdigit(), islower(), isnumeric(), isspace(), isupper() max(), min(), replace(), split(), Example programs

**List-** Introduction, Traversal, Operations, Slice, Methods, Delete element, Difference between lists and strings, Example program

**Dictionaries-** Introduction, Brief idea of dictionaries & lists

**Tuples-** Introduction, Brief idea of lists & tuples, Brief idea of dictionaries & tuples

**Unit IV: 10 Lecture Hours**

**I/O & File:** Data Streams, Creating Your Own Data Streams, Access Modes, Writing Data to a File, Reading Data from a File, Additional File Methods, Using Pipes as Data Streams

**Classes & Objects:** Creating class, Instance objects, Accessing attributes, Built in class attributes, destroying objects, Inheritance, Method overriding, Overloading methods, Overloading operators, Data hiding, Example program

**Unit V: 2 Lecture Hours**

**Python Exceptions** Exception handling: assert statement, Except clause - with no exceptions and multiple exceptions, Try - finally, raising exceptions, user-defined exceptions.

**Text Books:**

1. Introducing Python- Modern Computing in Simple Packages – Bill Lubanovic, O„Reilly Publication

2. Beginning Python: From Novice to Professional, Magnus Lie Hetland, Apress

3. Programming In Python, Dr. Pooja Sharma, BPB

**Reference Books**

1. Beginning Programming with Python for Dummies Paperback – 2015 by John Paul Mueller
2. Python Programming - Using Problem Solving Approach, Reema Thareja, OXFORD UNIVERSITY PRESS

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Classify** the fundamental Python syntax and semantics and show the use of Python control flow statements. | **PO1, PO12, PSO1** |
| **CO2** | **Demonstrate** the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples, sets and strings. | **PO1,PO2, PO4, PSO1** |
| **CO3** | **Develop** proficiency in the handling of functions. | **PO1, PO2, PO3, PO4, PSO1** |
| **CO4** | **Identify** the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python. | **PO2, PO3, PO4,PSO1** |
| **CO5** | **Find** the commonly used operations to handle run time error or Exception | **PO1, PO4, PSO1** |
| **CO6** | **Summarize** how to handle large data file with the help of various file handling methods. | **PO1, PO4, PSO1** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE11410 | Programming in Python | 3 | 2 | 2 | 3 | - | - | - | - | - | - | - | - | 3 | - | - |

1=weakly mapped 2= moderately mapped 3=strongly mapped

**Model Question Paper**

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| --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | |
| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING AND TECHNOLOGY**  **END-SEMESTER EXAMINATION**  **Name of the Program: BCA Semester: III**  **Code- CSE11410 Stream- CSE**  **Time: 03 Hrs.**  **Paper title– Programming in Python Total pages- 1**  **Max. Marks: 50 Total no. of questions- 12**  **Instructions:**  Attempt All Questions from **Section A** (Each Carrying 1 Marks); any **Three Questions** from **Section B** (Each Carrying 5 Marks). **Any Two Questions from Section C** (Each Carrying 10 Marks).  **1. At top of sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam.**  **2. Assumptions made if any, should be stated clearly at the beginning of your answer.**  **3. All parts of a Question should be answered consecutively.** | | | |
| **Section A (**Answer **All the Questions) (5 x 1 = 5)** | | | |
| 1. | **Explain** the Identifiers, Keywords and Variables in Python programming language with examples. | **U** | **CO1** |
| 2. | **List** the basic data types available in Python with examples. | **R** | **CO1** |
| ­­­3. | **Summarize** the difference between set and list data type. | **U** | **CO1** |
| 4. | **Solve** how slicing operator used on string data type. | **Ap** | **CO2** |
| 5. | **Why** strings are immutable with an example. | **R** | **CO2** |
| **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** | | | |
| 6. | **Apply** Python program to find the GCD of two positive numbers. | **Ap** | **CO1** |
| 7. | **Identity** whether the given string is a Palindrome or not using slicing. | **Ap** | **CO2** |
| 8. | **Show** the various file opening mode in Python language. | **U** | **CO6** |
| 9. | **Explain** with Example: i) try catch block ii) function calling | **U** | **CO3, CO5** |
| **SECTION C(**Attempt Any **Two Questions) (2 x 10 = 20)** | | | |
| 10. | **Solve** Pythonic code to sort a sequence of names according to their alphabetical order without using sort () function. | **Ap** | **CO2** |
| 11. | Consider a Rectangle Class and Create Two Rectangle Objects.**Solve** Python program to Check Whether the Area of the First Rectangle is Greater than Second by Overloading > Operator. | **Ap** | **CO4** |
| 12. | **Summarize** the advantage of functions in Python. **Show** the scope and lifetimes of Global & Local variables. | **U**  **R** | **CO3** |

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| **CSE11411** | Computer Organization & Architecture | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Prerequisites/Exposure** | **Digital Electronics, Microprocessor** | | | | |
| **Co-requisites** | **Programming Concepts** | | | | |

**Course Objectives:**

1. To study the basic organization and architecture of digital computers (CPU, memory, I/O, software).
2. Discussions will include digital logic and microprogramming. Such knowledge leads to better understanding and utilization of digital computers,
3. It can be used in the design and application of computer systems or as foundation for more advanced computer-related studies.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Define** functional block of a computer and relate data representation.

CO2. **Explain** and understand memory hierarchy design, memory access time formula, performance improvement techniques, and trade-offs.

CO3. **Illustrate** pipelined execution, parallel processing and principles of scalable performances.

CO4: **Analyze** the concepts of memory utilization in a computer system.

CO5: **Define** the implementation of parallel processors and Analyze the synchronization techniques

**Catalog Description:**

The architecture of computer systems and associated software. Topics include addressing modes, interrupt systems, input/output systems, external memory systems, assemblers, loaders, multiprogramming, performance evaluation, and data security.

**Course Content:**

**Unit I: 12 lecture hours**

**Functional blocks of a computer:** CPU, memory, input-output subsystems, control unit. Instruction set architecture of a CPU – registers, instruction execution cycle, RTL interpretation of instructions, addressing modes, instruction set. Case study – instruction sets of some common CPUs.

**Data representation:** signed number representation, fixed and floating-point representations, character representation. Computer arithmetic – integer addition and subtraction, ripple carry adder, carry look-ahead adder, etc. multiplication – shift-and-add, Booth multiplier, carry save multiplier, etc. Division restoring and non-restoring techniques, floating point arithmetic.

**Unit II: 10 lecture hours**

**Introduction** to x86 architecture.

**CPU control unit design:** hardwired and micro-programmed design approaches, Case study – design of a simple hypothetical CPU.

**Memory system design:** semiconductor memory technologies, memory organization.

**Peripheral devices and their characteristics:** Input-output subsystems, I/O device interface, I/O transfers – program controlled, interrupt driven and DMA, privileged and non-privileged instructions, software interrupts and exceptions. Programs and processes – role of interrupts in process state transitions, I/O device interfaces – SCII, USB

**Unit III: 8 lecture hours**

**Pipelining:** Basic concepts of pipelining, throughput and speedup, pipeline hazards.

**Unit IV: 8 lecture hours**

**Memory organization:** Memory interleaving, concept of hierarchical memory organization, cache memory, cache size vs. block size, mapping functions, replacement algorithms, write policies.

**Unit V: 7 lecture hours**

**Parallel Processors:** Introduction to parallel processors, parallel computer models, principles of scalable performances, multiprocessors and multicomputer, message passing mechanism, scalable & Multithreaded dataflow architecture, Concurrent access to memory and cache coherency and synchronization techniques, GPU Processors.

**Text Books:**

1. “Computer Organization and Design: The Hardware/Software Interface”, 5th Edition by David A. Patterson and John L. Hennessy, Elsevier.
2. “Computer Organization and Embedded Systems”, 6th Edition by Carl Hamacher, McGraw Hill Higher Education.

**Reference Books:**

1. “Computer Architecture and Organization”, 3rd Edition by John P. Hayes, WCB/McGraw-Hill
2. “Computer Organization and Architecture: Designing for Performance”, 10th Edition by William Stallings, Pearson Education.
3. “Computer System Design and Architecture”, 2nd Edition by Vincent P. Heuring and Harry F. Jordan, Pearson Education

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Define** functional block of a computer and relate data representation. | **PO1,PO3,PO6,PO12,PSO1,PSO3** |
| **CO2** | **Explain** and understand memory hierarchy design, memory access time formula, performance improvement techniques, and trade-offs. | **PO1,PO2,PO3,PO6,PO12,PSO1** |
| **CO3** | **Illustrate e**pipelined execution, parallel processing and principles of scalable performances. | **PO1,PO3,PO6,PO12,PSO1,PSO3,** |
| **CO4** | **Analyze** the concepts of memory utilization in a computer system. Define the implementation of parallel processors and Analyze the synchronization techniques | **PO1,PO3,PO5,PO6,PO12,PSO1,PSO3** |
| **CO5** | **Define** the implementation of parallel processors and Analyze the synchronization techniques | **PO1,PO3,PO5,PO6,PO12,PSO1** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex problems | Modern tool usage | The engineer and society | Environment and sustainability | Ethics | Individual or team work | Communication | Project management and finance | Life-long Learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE11411 | Computer Organization & Architecture | 3 | 2 | 3 | - | 2 | 3 | - | - | - | - | - | 3 | 3 | 2 | 3 |

1=weakly mapped 2= moderately mapped 3=strongly mapped

**Model Question Paper**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | | |
| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING AND TECHNOLOGY**  **END-SEMESTER EXAMINATION**  **Name of the Program: B.C.A. Semester: III**  **Code- CSE11411 Stream- CSE Time: 03 Hrs.**  **Paper title– Computer Organization & Architecture Total pages- 2**  **Max. Marks: 50 Total no. of questions- 12**  **Instructions:**  Attempt All Questions from **Section A** (Each Carrying 1 Marks); any **Three Questions** from **Section B** (Each Carrying 5 Marks)**.** Any **Two Questions from Section C** (Each Carrying 10 Marks)**.**  1. **At top of sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam.**  2. **Assumptions made if any, should be stated clearly at the beginning of your answer.**  3. **All parts of a Question should be answered consecutively.** | | | | |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | | |
| 1. | **What** is an Instruction? | | **R** | **CO1** |
| 2. | **What** is an Instruction? | | **R** | **CO1** |
| ­­­ 3. | **What** do you understand by byte addressable memory? | | **R** | **CO2** |
| 4. | **What** is a processor clock? | | **R** | **CO1** |
| 5. | **What** do you understand by RTN? | | **R** | **CO1** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** | |  | |
| 6. | Let us assume that a complete execution of a program requires the execution of 100 machine language instruction. Some instructions may be executed more than once when they are inside loop, So we can assume that the average no of steps needed to execute one basic instruction is 7, such that each and every basic step completes in 1 clock cycle. If a 10 Hz – processor is used then **calculate** time required by the processor to execute the program. What is an Interrupt? What is branching? | | **C** | **CO2** |
| 7. | **Discuss** the properties of memory hierarchy with diagram? Discuss LRU & FIFO page replacement policies with example If the memory block requests are in the order then which algorithm will result less page faults  3, 5, 2, 8, 0, 6, 3, 9, 16, 20, 17, 25, 18, 30, 24, 2, 63, 5, 82, 17, 24 | | **Ap, R** | **CO2** |
| 8. | **Explain** clearly, the register-indirect, the indexed and the base register with indexed addressing modes. Next, point out the exact difference between the three.. | | **U** | **CO3** |
| 9. | **Draw** the schematic diagram of hardware needed to implement “shift-subtract” restoring division technique (positive integers); next, give a step by step illustration of the above division technique with dividend D = (1000)2 and divisor M = (0011). | | **U** | **CO2** |
|  | **SECTION C (Answer Any Two Questions) (2 x 10 = 20)** | |  | |
| 10. | **State** the algorithm designed to overcome the disadvantage of Booths multiplication algorithm along with the flowchart. Represent each and every step of the proposed algorithm for multiplying 7 and (-2). | | **C** | **CO3** |
| 11 | The main memory of a system has a word length of 32-bits & is both word and byte addressable. The system has a 16 bit address bus. The lowest numbered byte in a word occupies bits 0 through 7. The byte number of lowest numbered byte in a word is the byte address for that word. Both bytes and words are numbered starting from 0. Now, **Find** the following:  Byte address of the 9th memory word  Word address of the 9th byte  Word address of the word containing byte with byte address = 34  Number of words in this byte addressable memory | | **C** | **CO3** |
| 12. | **Discuss** the properties of memory hierarchy with diagram? Write a short note on Indexed & Indirect memory addressing scheme. | | **C** | **CO3** |

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| **CSE11412** | Database Management System | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Set Theory, Knowledge of programming language.** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To understand terms related to database design and management

2. To understand the objectives of data and information management

3. To understand the database development process

4. To understand the relational model and relational database management system

5. To assess data and information requirements

6. To construct conceptual data models

7. To develop logical data models

8. To evaluate the normality of a logical data model, and correct any anomalies

9. To develop physical data models for relational database management systems

10. To implement relational databases using a RDBMS

**Course Outcomes:**

On completion of this course, the students will be able to

1. **Describe** the characteristics of database and the architecture of Database system.
2. **Design** Entity-Relationship Model for enterprise level databases
3. **Develop** the database and provide restricted access to different users of database and formulate the Complex SQL queries.
4. **Analyze** various Relational Formal Query Languages and various Normal forms to carry out Schema refinement.
5. **Utilize** suitable Indicesand Hashing mechanisms for real time implementation.
6. **Analyze** various concurrency control protocols and working principles of recovery algorithms.

**Catalog Description:**

Databases are at the heart of modern commercial application development. Their use extends beyond this to many other environments and domains where large amounts of data must be stored for efficient update and retrieval. The purpose of this course is to provide a comprehensive introduction to the use of database management systems for applications.

**Course Content:**

**Unit I: 8 lecture hours**

Database system architecture: Data Abstraction, Data Independence, Data Definition Language (DDL), Data Manipulation Language (DML).

Data models: Entity-relationship model, network model, relational and object-oriented data models, integrity constraints, data manipulation operations.

ER models: Entity Set, Relation Ship Set, Cardinality Properties, Type of Entities, Type of Keys, Aggregation, Specialization and Generalization.

**Unit II: 9 lecture hours**

**Relational query languages:** Relational algebra, Fundamental Operations, Additional Operations. Select, Project, Cartesian Product, UNION, Set difference, Rename. Types of joining operations, Division, Intersection, Aggregate. Tuple and domain relational calculus, SQL3, DDL and DML constructs, Open source and Commercial DBMS - MYSQL, ORACLE, DB2, SQL server.

**Unit III: 10 lecture hours**

Relational database design: Integrity Constraint, Domain Constrain, Referential Integrity, Functional Dependencies, Closure of Set, Cover and Canonical Cover, Types of Anomalies, Armstrong's axioms, Extended Armstrong's axioms, Assertions and Demons.

Data Base Decomposition: Domain and data dependency, Normal forms: 1NF, 2 NF, 3 NF, BCNF, Dependency preservation, Lossless design.

**Unit IV: 9 lecture hours**

Query processing and optimization: Evaluation of relational algebra expressions, Query equivalence, Join strategies, Query optimization algorithms.

Storage strategies: Indices, B-trees, B+-trees, hashing, File System, Disk Organization, Physical Storage, Buffer management.

**Unit V: 9 lecture hours**

Transaction processing: Failure, Recovery from Failure, Different States of Transaction, Transaction Isolation, ACID property, Serializability of scheduling, Multi-version and optimistic Concurrency Control schemes.

Concurrency control: Locking and timestamp-based schedulers, 2-Phase Locking Protocol, Dead Lock,

Database Security: Authentication, Authorization and access control, DAC, MAC and RBAC models, Intrusion detection, SQL injection.

Advanced topics: Distributed databases, Data warehousing and data mining.

**Text Books:**

1. “Database System Concepts”, 6th Edition by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill

2. “Principles of Database and Knowledge – Base Systems”, Vol 1 by J. D. Ullman, Computer Science Press.

**Reference Books:**

1. “Fundamentals of Database Systems”, 5th Edition by R. Elmasri and S. Navathe, Pearson Education

2. “Foundations of Databases”, Reprint by Serge Abiteboul, Richard Hull, Victor Vianu, Addison-Wesley.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Describe** the characteristics of database and the architecture of Database system. | **PO1,PO2** |
| **CO2** | **Design** Entity-Relationship Model for enterprise level databases | **PO1,PO3,PO4, PSO1, PO2** |
| **CO3** | **Develop** the database and provide restricted access to different users of database and formulate the Complex SQL queries. | **PO1, PO3, PO4, PO2,PSO3, PO12** |
| **CO4** | **Analyze** various Relational Formal Query Languages and various Normal forms to carry out Schema refinement. | **PO1,PO2,PO3, PO4,PO7, PO12, PSO1, PSO3** |
| **CO5** | **Utilize** suitable Indicesand Hashing mechanisms for real time implementation. | **PO1,PO2,PO7,PO12, PSO3, PSO1** |
| **CO6** | **Analyze** various concurrency control protocols and working principles of recovery algorithms. | **PO1,PO2,PO4, PO12, PO7, PSO2** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Cours-e Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE11412 | Database Management Systems | 3 | 3 | 2 | 2 | - | - | 2 | - | - | - | - | 2 | 3 | 2 | 3 |

1=weakly mapped 2= moderately mapped 3=strongly mapped



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: III Stream: CSE

PAPER TITLE: Database Management System

PAPER CODE: CSE11412

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 02

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **Explain** the Delete anomalies with proper example? | **U** | **CO1** |
| 2. | **Define** is Canonical cover with example? | **R** | **CO5** |
| ­­­ 3. | **Explain** weak entity with proper diagram? | **U** | **CO4** |
| 4. | **Explain** redundant attribute with proper example? | **U** | **CO3** |
| 5. | **Explain** derived attribute with proper example? | **U** | **CO3** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Define** the symbols Additional operators with proper example? | **R** | **CO1** |
| 7. | **What** is Cartesian product explainwith proper example? | **R** | **CO1** |
| 8. | **Describe** Armstrong's Axioms with example? | **U** | **CO1** |
| 9. | **Develop** an E-R diagram Hotel reservation system with proper cardinality property. | **AP** | **CO2** |
|  | **SECTION C (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | a) **What is** the highest NF of each of the following relations?  i) R1 ( A, B,C,D,E ) with FDs are AB→ C, B → DE  ii) R2 ( J, K, L, M ) with FDs are J → K, K → LM  b) **Explain** ACID Properties with proper example. 5+5 | **R**  **U** | **CO5,CO4** |
| 11. | i). Consider the following schema:  Loan(Loan no, Tenure, Roi, Type, Amount,Br\_Code)  User(cust no, Account\_no,bname, baddress)  Brunch(Br\_Code,Br\_Add,IFSC\_Code)  **Build** the following queries on the table. (In SQL)  (a) Find the Loan number whose Tenure is more than 5 years.  (b) Display the amount of the loanborrowed by "Vijoy"  (c) Find the borrower name who lives in same city as "Vijoy"  (d) Find the borrower name and address who had car loan.  (e) Find the total loan amount issued by Br\_code“Br\_C\_002”. | **AP** | **CO4** |
| 12. | **Identify** the Boyce-Codd normal form with example? Draw a state diagram and **discuss** the typical states during transaction execution? 3+7 | **Ap** | **CO5** |

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| **CSE12413** | Object Oriented Programming Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Basic concept of programming** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

To understand how to design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling, functions and object oriented approaches.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Define** classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem.

CO2**. Illustrate** object oriented modelling techniques like classes and Instances modelling techniques

CO3**. Solve** programs using standard design patterns.

CO4**. Interpret** fundamentals of object-oriented programming in Java, including defining

Classes, invoking methods, using class libraries, etc.

CO5. **Construct** programming solutions with exception handling and multi-threading concept

CO6. **Solve** GUI program with proper event handling techniques.

**Catalog Description:**

This course investigates object-oriented methods including object-oriented programming methodologies and techniques. Current methodology is emphasized. The use of object-oriented features such as encapsulation, information hiding, inheritance and polymorphism is reinforced by class assignments and programming exercises. The importance of multi-threading and exception handling is introduced in this course.

**Course Content:**

**List of Programs:**

1. Assignments based on class, constructor.
2. Assignments based on overloading.
3. Assignments based on inheritance, overriding.
4. Assignments based on wrapper class, arrays.
5. Assignments based on developing interfaces- multiple inheritances, extending interfaces
6. Assignments based on creating and accessing packages
7. Assignments based on multithreaded programming
8. Assignments based on applet programming

**Text Books:**

1. “Java Fundamentals - A Comprehensive Introduction”, Illustrated Edition By Daleskrien, Herbert Schildt, Mcgraw-Hill Education.

**Reference Books:**

1. “Java For Programmers”, 2nd Edition By Paul Deitel And Harvey Deitel, Pearson Education.

2. “Thinking In Java”, Low Price Edition By Bruce Eckel, Pearson Education

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO-1** | Define classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem | **PO1, PSO1** |
| **CO-2** | Illustrate object oriented modelling techniques like classes and Instances modelling techniques | **PO1, PO3, PSO1** |
| **CO-3** | Interpret fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc. | **PO1, PO3, PSO1** |
| **CO-4** | Construct programming solutions with exception handling and multi-threading concept | **PO1, PO2, PO3, PSO1** |
| **CO-5** | Construct programming solutions with exception handling and multi-threading concept | **PO1, PO2, PO12, PSO3** |
| **CO-6** | Solve GUI program with proper event handling techniques | **PO1, PO2, PO5, PO12, PSO3** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Cours-e Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE12413 | Object Oriented Programming Lab | 3 | 3 | 3 | - | 2 | - | - | - | - | - | - | 3 | 3 | 3 | 3 |

1=weakly mapped 2= moderately mapped 3=strongly mapped



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: III Stream: CSE

PAPER TITLE: Object Oriented Programming Lab

PAPER CODE: CSE12413

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 5 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

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| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 10 = 50)** | | | |
| 1. | **Write** a java program to implement the concept of method overloading. | **U** | **CO2** |
| 2. | **Write** a java program to implement the concept of method overriding. | **U** | **CO3** |
| ­­­ 3. | **Write** a java program to implement the concept of nesting of methods. | **U** | **CO4** |
| 4. | **Write** a java program to implement multiple inheritance. | **U** | **CO2** |
| 5. | **Write** a java program to implement the concept of multithreaded programming. | **U** | **CO1** |

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| **CSE12414** | Python Programming Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hour -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Knowledge of Python Language** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To **acquire** programming skills in core Python.
2. To **acquire** Object Oriented Skills in Python
3. To **develop** the skill of designing Graphical user Interfaces in Python
4. To **develop** the ability to solve and analyse mathematical problem in Python

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Classify** how to Write, Test and Debug Python Programs

CO2. **Apply** Conditionals structure Loops and various operators used in Python Programs.

CO3. **Experiment with** functions and **demonstrate** compound data using Lists, Tuples and

Dictionaries

CO4. **Solve** how Read and write data from & to files in Python.

CO5. **Explain** and **develop** the concept of OOP in Python.

**Catalog Description:**

This course introduces basic concepts in programming language to solve numerical problems. All the lectures will be devoted on discussions of basic theories and advanced topics, focusing on practical implementation of knowledge. Classes will be conducted by lecture as well as power point presentation, audio visual virtual lab session. The tutorials will familiarize the students with practical problem-solving techniques led by the course coordinator. Students will strongly grab the basic concepts of the subject via exercise and discussions with the course coordinator.

**Course Content:**

**Experiment 1:**

1. Running instructions in Interactive interpreter and a Python Script.
2. Develop a program to purposefully to raise Indentation Error and Correct it.

**Experiment 2:**

Implement different data types, Operators and Expressions using Python language.

**Experiment 3:**

Implement the knowledge using Decision Statements(if, if-else, if-elif ladder)

**Experiment 4:**

Familiarize and usage of Loop & nested loop Statements (for,while, do-while)

**Experiment 5:**Implement Python program using different sequential data types like List, Tuple, Dictionary Set

**Experiment 6:**

Understand and develop function programming, its types and function-call.

**Experiment 9:**

Implement the concept of data files and file handling in Python language.

**Experiment 10:**

Implement the concept of OOP properties with the help of Python syntax.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Course Outcomes (COs)** | | **Mapped POs and PSOs** |
| **CO-1** | **Classify** how to Write, Test and Debug Python Programs | **PO1, PO2** |
| **CO-2** | **Apply** Conditionals structure Loops and various operators used in Python Programs | **PO2, PO3, PSO1** |
| **CO-3** | **Experiment with** functions and **demonstrate** compound data using Lists, Tuples and Dictionaries | **PO1, PO2, PO3, PO4** |
| **CO-4** | **Solve** how Read and write data from & to files in Python. | **PO1, PO2, PO4, PSO1** |
| **CO -5** | **Explain** and **develop** the concept of OOP in Python. | **PO1, PO2, PO3, PO4, PSO1** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE12414 | Python Programming Lab | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 3 | - | - |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: III Stream: CSE

PAPER TITLE: Python Programming Lab

PAPER CODE: CSE12414

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 5 Total No of Pages: 01

**Instruction for the Candidate:**

* 1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
  2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
  3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 10 = 50)** | | | |
| 1. | Write a program to purposefully to **Find** Indentation Error and Correct it. | **R** | **CO1** |
| 2. | **Solve** a program to swap values of two variables with and without using third variable. | **AP** | **CO2** |
| ­­­ 3. | **Develop** a program to check whether the entered year is leap year or not (a year is leap if it is divisible by 4 and divisible by 100 or 400.) | **AP** | **CO2** |
| 4. | **Construct** a program to create a structure named company which has name, address, phone and no Of Employee as member variables. Read name of company, its address, phone and no Of Employee. Finally display these members‟ value. | **AP** | **CO3** |
| 5. | Write a program to **summarize** the concept of Multiple Inheritance with the help of Python syntax. | **U** | **CO5** |

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| **CSE12415** | **Computer Organization Lab** | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Prerequisites/Exposure** | **Digital Electronics, Microprocessor** | | | | |
| **Co-requisites** | **Programming Concepts** | | | | |

**Course Objectives:**

1. To study the basic organization and architecture of digital computers (CPU, memory, I/O, software).
2. Discussions will include digital logic and microprogramming. Such knowledge leads to better understanding and utilization of digital computers,
3. It can be used in the design and application of computer systems or as foundation for more advanced computer-related studies.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1**. Write** VHDL & Verilog programs.

CO2. **Design** Logic circuit & ALU

**Catalog Description:**

The architecture of computer systems and associated software. Topics include addressing modes, interrupt systems, input/output systems, external memory systems, assemblers, loaders, multiprogramming, performance evaluation, and data security.

**Course Content:**

1. Implementation based on basic Logic Gates (AND, OR, NOT, NAND, NOR, XOR, XNOR)
2. Implementation based on Half adder and Full adder (using data flow, behavioral, structural modeling)
3. Implementation based on Half subtractor and Full subtractor (using data flow, behavioral, structural modeling)
4. Implementation based on Full adder using two half adders and Full subtractor using two half subtractors
5. Implementation based on multiplexer, demultiplexer, Encoder and Decoder
6. Implementation based on D Flip Flop, SR Flip Flop, JK Flip Flop, T Flip Flop
7. Implementation based on 4 Bit Register (using Structural modeling)
8. Implementation based on 4 Bit Comparator (using Behavioral modeling)
9. Implementation based on 4 Bit ALU

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Write** VHDL & Verilog programs. | **PO1,PO3,PO5,PO12,PSO1,PSO2** |
| **CO2** | **Design** Logic circuit & ALU. | **PO1,PO3,PO5,PO12,PSO1,PSO2** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex problems | Modern tool usage | The engineer and society | Environment and sustainability | Ethics | Individual or team work | Communication | Project management and finance | Life-long Learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE12415 | Computer Organization Lab | 3 | - | 3 | - | 3 | - | - | - | - | - | - | 3 | 3 | 3 | - |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | | |
| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING AND TECHNOLOGY**  **END-SEMESTER EXAMINATION**  **Name of the Program: B.C.A. Semester: III**  **Code- CSE12415 Stream- CSE Time: 03 Hrs.**  **Paper title– Computer Organization Lab Total pages- 1**  **Max. Marks: 40 Total no. of questions- 5**  **Instructions:**  Attempt Any two Questions**.**  1. **At top of sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam.**  2. **Assumptions made if any, should be stated clearly at the beginning of your answer.**  3. **All parts of a Question should be answered consecutively.** | | | | |
|  | | | | |
| 1. | **Construct** a VHDL program implementation based on Full adder using two half adders and Full subtractor using two half subtractors | | **C** | **CO1** |
| 2. | **Construct** a VHDL program Implementation based on Half adder and Full adder (using data flow, behavioral, structural modeling) | | **C** | **CO1** |
| ­­­ 3. | **Construct** a VHDL program Implementation based on D Flip Flop, SR Flip Flop, JK Flip Flop, T Flip Flop | | **C** | **CO2** |
| 4. | **Construct** a VHDL program Implementation based on multiplexer, demultiplexer, Encoder and Decoder | | **C** | **CO1** |
| 5. | Construct a VHDL program **Implementation based on 4 Bit ALU** | | **C** | **CO1** |

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| **CSE12416** | Database Management Systems Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Set Theory, Knowledge of programming language.** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To understand the fundamentals of how data is stored in computer systems.

2. To know the fundamentals of Structured Query Language (SQL) and how it can be used to store and retrieve data from a relational database.

3. To be able to apply the principles used in class to build a web-based database application from the ground up.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Organize** the basic concepts of Database Systems and Applications.

CO2. **Construct** the basics of SQL query from relational algebra expressions.

CO3. **Define** a commercial relational database system (Oracle, MySQL) by writing SQL

using the system.

CO4. **Apply** query optimize algorithms to Optimize the Query.

**Catalog Description:**

The primary goal of this class is to learn principles and practices of database management and database design. Over the course of the semester we will discuss the database relational database design, normalization, SQL queries, reports and other interfaces to database data, and documentation. Lectures will also cover writing ethical and privacy issues associated with database systems. In- class instruction and exercises will focus on the fundamentals for creating sophisticated, interactive, and secure database applications.

**Course Content:**

**Experiment 1:**

Familiarization of structured query language.

**Experiment 2:**

Table Creation.

**Experiment 3:**

Insertion, Updation, Deletion of tuples.

**Experiment 4:**

Executing different queries based on different functions.

**Experiment 5:**

Performing joining operations.

**Experiment 6:**

Nested Queries.

**Experiment 7:**

Use of aggregate functions.

**Experiment 8:**

Use of group functions.

**Experiment 9:**

Use of order by functions.

**Experiment 10:**

Arithmetic operations.

**Experiment 11:**

Trigger using SQL.

**Experiment 12:**

Introduction to PL/SQL.

**Experiment 13:**

Report generation of various queries.

**Experiment 14:**

Merging Data Bases with front end using ODBC connection.

**Experiment 15:**

SQL Injection on a non-harmful test page.

**Text Books:**

1. “Database System Concepts”, 6th Edition by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill

2. “Principles of Database and Knowledge – Base Systems”, Vol 1 by J. D. Ullman, Computer Science Press.

**Reference Books:**

1. “Fundamentals of Database Systems”, 5th Edition by R. Elmasri and S. Navathe, Pearson Education

2. “Foundations of Databases”, Reprint by Serge Abiteboul, Richard Hull, Victor Vianu, Addison-Wesley.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

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| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Organiz**e the basic concepts of Database Systems and Applications. | **PO1,PSO1,PO12, PO2, PSO3** |
| **CO2** | **Construct** the basics of SQL and construct queries using SQL in database creation interaction. | **PO1, PO2,PO3, PSO1, PO4, PSO3, PSO2** |
| **CO3** | **Design** a commercial relational database system (Oracle, MySQL) by writing SQL using the system. | **PO1,PO2,PO4, PO3, PSO3, PO7, PSO1** |
| **CO4** | **Apply** query optimize algorithms to Optimize the Query. | **PO1, PO2,PO4,PO7, PSO2, PSO3** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Cours-e Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE12416 | Database Management Systems Lab | 3 | 3 | 2 | 3 | - | - | 2 | - | - | - | - | 2 | 2 | 2 | 3 |

1=weakly mapped 2= moderately mapped 3=strongly mapped



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: III Stream: CSE

PAPER TITLE: Database Management Systems Lab

PAPER CODE: CSE12416

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 5 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

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| **Part A (1X 20=20)** | | | |
| Q1. | **Create the following tables**  Table Attributes  Customercid,cname,loc,sex,dob  Bank\_brnbcode,bloc,bsate  Deposit Dacno,dtype,ddate,damt  Loan Lacno,ltype,ldate,lamt  Accounts\_inBcode,cid  Depositorcid,dacno  Borrower cid,lacno  **Please enter at least 15 values for each table,Include necessary constraints. Please follow your query before entering your values.** | **R** | **CO1, CO2** |
| **Part-B (4X5=20)** | | | |
| Q2. | **Create** a SQL query to find out the names of all the customers. | **U** | **CO2** |
| Q3. | **Change** the ldate of Lacno ‘L0012’ to 20/05/2010. | **R** | **CO3** |
| Q4. | **Write** a SQL query to check the total amount of loan issued by branch code “A002”. | **AP** | **CO4** |
| Q5. | **Select** the First name of the customers where customers last name does not exist in your table. | **R** | **CO2** |

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| **ECE11503** | Data Communication & Computer Network | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **FDM, TDM, Modulation** | | | | |
| **Co-requisites** | **Fundamentals of Digital Communication** | | | | |

**Course Objectives:**

1. To investigate the configuration of a network.
2. To enable students to enlist the components of a network
3. To explain the importance of protocols in data communication networks.
4. To compare protocols based on their attributes in a data network.
5. To enable the students for acquiring the fundamental knowledge of switching, routing, congestion control and security issues related to a network.

**Course Outcomes:**

On completion of this course, the students will be able to

1. **Relate** the basics of Computer Networks, OSI and TCP IP Layered architecture, Model the LAN and WAN configuration using different media.
2. **Demonstrate** and practice the application of various layers of the OSI and TCP/IP models as well as various LAN and WAN configurations
3. **Appraise** the application of layered architecture and network security issues
4. **Apply** Matrix the knowledge of layered architecture/models to practical computer networks as well as various encryption and de-cryption algorithms for securing networks.
5. **Demonstrate** and practice the application of OSI, TCP/IP Models, Firewalls, Bridges and Routers etc.
6. **Understand** the fundamentals concept of digital communication techniques and medium, layering in networks, topologies in a network, network security issue, and LAN Topologies.

**Catalog Description:**

This module introduces students to computer networks and concentrates on building a firm foundation for understanding Data Communications and Computer Networks. It is based around the OSI Reference Model that deals with the major issues in the bottom three (Physical, Data Link and Network) layers of the model. Students are also introduced to the areas of Network Security and Mobile Communications. This module provides the student with fundamental knowledge of the various aspects of computer networking and enables students to appreciate recent developments in the area.

**Course Content:**

**Module 1: Data Transmission Basic Concepts and Terminology 2 lecture hours**

Review of Computer Communications Foundations, Review of Data Transmission Principles, Transmission Components; ASK, PSK, QPSK, QAM, M-ary digital modulation; Data Compression.

**Module 2: Computer network 6 lecture hours**

Hosts, Communication Channels, Protocols, Network Topology, Performance of Network, Network Classification, Advantages & Disadvantages of Network, OSI Reference Model, TCP/IP.

**Module 3: Data Line Devices: 5 lecture hours**

Modems, DSL, ADSL, Multiplexer and Different Multiplexing Techniques: (FDM, TDM).

**Module 4: Physical Layer: 6 lecture hours**

Guided Transmission, Media, Wireless Transmission Medium, Circuit Switching and Telephone Network, High Speed Digital Access.

**Module 5: Data Link Layer: 7 lecture hours**

Need for Data Link Control, Flow Control & Error Control (Flow control mechanism, Error Detection and Correction techniques) Data Link Layer Protocol.

**Module 6: Network Layer: 7 lecture hours**

Routing, Congestion control, Internetworking principles, Internet Protocols (IPv4 packet format, Hierarchal addressing sub netting, ARP, RARP), Bridges, Routers.

**Module 7: Local Area Network: 6 lecture hours**

Definition of LAN, LAN topologies, Layered architecture of LAN, MAC, IEEE standard. Ethernet LAN, CSMA, CSMA/ CD, Token passing LAN.

**Module 8: Network Security: 6 lecture hours**

Security Requirement, Data encryption strategies, authentication protocols, Firewalls.

**Text Books:**

1. B A. Forouzan, “Data Communication and Networking”, 4/e, McGraw Hill, 2006.
2. W Stallings, “Data and Computer Communication” –7/e Pearson
3. A Tanenbarum, “Computer Networks” –4th Edition, PHI, 2004/Pearson Education 4th Edition

**Reference Books:**

1. Jean Wairand - Communication Networks (A first Course) - Second Edition - WCB/McGraw Hill - 1998.
2. Leon-Garcia and Widjaja, “Communication Networks”, 2/e McGraw Hill, 2004.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Relate** the basics of Computer Networks, OSI and TCP IP Layered architecture, Model the LAN and WAN configuration using different media. | **PO1, PO3** |
| **CO2** | **Demonstrate** and practice the application of various layers of the OSI and TCP/IP models as well as various LAN and WAN configurations. | **PO2, PO3, PO7, PSO1** |
| **CO3** | **Appraise** the application of layered architecture and network security issues | **PO2, PO3, PO7** |
| **CO4** | **Apply** Matrix the knowledge of layered architecture/models to practical computer networks as well as various encryption and de-cryption algorithms for securing networks. | **PO1, PO2, PO3, PO7, PSO1** |
| **CO5** | **Demonstrate** and practice the application of OSI, TCP/IP Models, Firewalls, Bridges and Routers etc. | **PO1, PO2, PO3, PO5, PO7, PSO1** |
| **CO6** | **Relate** the fundamentals concept of digital communication techniques and medium, layering in networks, topologies in a network, network security issue, and LAN Topologies. | **PO1, PO3, PO5** |

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|  |  | Engineering knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECE11503 | Data Communication and Computer Networks | 3 | 3 | 2 | 3 | 2 | - | 3 | - | - | - | - | - | 3 | - | - |

1=weakly mapped 2= moderately mapped 3=strongly mapped

**Model Question Paper**

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| --- | --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | | |
| Course: ECE11503 – Data Communication & Computer Network **Program: BCA Stream: CSE Semester: IV**  **Time: 03 hrs. Max. Marks:50**  **Instructions:**  Attempt all the questions from **Section A** (each carrying 1 marks); any **Three Questions** from **Section B** (each carrying 5 marks)**.**Any **Two Questions** from **Section C** is Compulsory (carrying 15 marks)**.** | | | | | |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | | | |
| 1. | **Explain** Shannon’s and Nyquist theorem with suitable equations*.* | | **U** | **CO1** | |
| 2. | **What** is the difference between a Hub and a Switch? Explain. | | **U** | **CO1** | |
| ­­­ 3. | **Explain** the Ring topology in brief. How can we overcome the limitations of uni-directional ring topology? | | **An** | **CO6** | |
| 4. | **What** is the need of sequence numbers in the Sliding window protocol? | | **R** | **CO3** | |
| 5. | **Explain** the need of Data link layer in the OSI model. | | **U** | **CO6** | |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** | |  |  | |
| 6. | **What** is IP addressing? What are the different classes of IP? What is the difference between static and dynamic IP’s? | | **R**  **An** | **CO1** | |
| 7. | **Explain** the process of encryption and decryption of a message using simple cryptography model. For n number of users, how many keys are needed if we use private and public cryptography schemes? | | **U** | **CO3** | |
| ­­­8. | The bit pattern 01011001 is to be transmitted using the following techniques: (i) ASK (ii) FSK (iii) PSK. **Show** the transmitted waveform for each technique. | | **Ap** | **CO4** | |
| 9. | **Outline** and explain the OSI reference Model. Also, compare TCP and UDP protocols in context of TCP/IP reference model. | | **R**  **An** | **CO6** | |
|  | **SECTION C (**Attempt any **two Question)(2 x 10 = 20)** | |  |  | |
| 10. | **Develop** and explain simple data communication model. Draw and explain three differences between OSI and TCP/IP reference models. What is the purpose of the timer at the sender site in systems using ARQ? | | **U** | **CO2** | |
| 11. | **Define** bit rate and baud rate. An analog signal carries four bits in each signal element. If 1000 signal elements are sent per second, find the baud rate and bit rate. | | **R**  **Ap** | **CO4** | |
| 12. | **Explain** fixed routing algorithm with the help of suitable example. Explain the limitation of flooding technique in context of routing. Explain hidden station problem and exposed station problem in CSMA/CA. | | **U**  **Ap** | **CO5** | |

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| **CSE11417** | Algorithm Design | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basic knowledge of data structure and programming** | | | | |
| **Co-requisites** | **Knowledge of Basic Computer Organization** | | | | |

**Course Objectives:**

1. To introduce problem solving approach through design.
2. To develop students to analyse the existing algorithms and approach for improvement.
3. To introduce the students a perspective to different design and analysis approach for algorithm(s) to solve a problem.
4. To develop students to select optimal solution to a problem by choosing the most appropriate algorithmic method.

**Course Outcomes:**

On completion of this course, the students will be able to

**CO1. Interpret** the basics about algorithms and learn how to analyse and design

algorithms

**CO2. Choose** brute force, divide and conquer, dynamic programming and greedy

techniques methods to solve computing problems

**CO3. Interpret** the approach for solving problems using iterative method.

**CO4. Demonstrate** the solution of complex problems using backtracking, branch and bound techniques.

**CO5. Classify** the different Computability classes of P, NP, NP-complete and NP-hard.

**Catalog Description:**

Algorithmic study is a core part of Computer Science. This study caters to all possible applicable areas of Computer Science. This study includes observation, design, analysis and conclusion. Various types of algorithms have different notion of implementation according to their cost (in terms their time and space complexity). This study also includes refinement of one algorithm as per the applicability to real problems. Categorization of algorithms according to different method of design also includes in this course. It also compares the same algorithm using different algorithm design methods. For example, Knapsack problem can be solved in Greedy approach and Dynamic approach, both are optimization method. This course enables the students to think analytically while applying, designing an algorithm to solve a specific problem.

**Course Content:**

**Unit I: 08 lecture hours**

**Introduction:** characteristics of an algorithm. Algorithm analysis: Asymptotic analysis of complexity bounds: best, average and worst-case behavior, standard notations. Empirical measurements, time and space complexity. Analyze recursive algorithms Using recurrence relations: – demonstrate using recursive algorithms.

**Unit II: 12 lecture hours**

**Algorithmic Strategies:** Brute-Force, Greedy, Branch-and-Bound, Backtracking and Dynamic Programming methodologies: Heuristics: - characteristics and their domains of applicability. Algorithms for String/Text matching problems, Huffman Code and Data compression problems, Subset-sum and Knapsack problem

**Unit III: 12 lecture hours**

**Graph and Tree Algorithms:** Traversal algorithms: Depth First Search (DFS) and Breadth **Graph and Tree Algorithms:** Depth and Breadth First traversals. Shortest path algorithms, Transitive closure, Minimum Spanning Tree, Topological sort and Network Flow problems.

**Unit IV: 08 lecture hours**

**Tractable and Intractable Problems:** Computability, The Halting problem. Computability classes:-P, NP, NP-complete and NP-hard. Cook’s theorem. Standard NP-complete problems Reduction techniques

**Unit V: 05 lecture hours**

**Advanced Topics:** Approximation algorithms, Randomized algorithms, Class of problems beyond NP – PSPACE

**Text Books:**

1. Introduction to Algorithms, 4TH Edition, Thomas H Cormen, Charles E Lieserson, Ronald L Rivest And Clifford Stein, MIT Press/ Mcgraw-Hill.
2. Fundamentals of Algorithms – E. Horowitz Et Al.

**Reference Books:**

1. Algorithm Design, 1ST Edition, Jon Kleinberg and Évatardos, Pearson.
2. Algorithm Design: Foundations, Analysis, And Internet Examples, Second Edition, Michael T Goodrich And Roberto Tamassia, Wiley.
3. Algorithms -- A Creative Approach, 3RD Edition, Udimanber, Addison-Wesley, Reading, MA.

**Modes of Evaluation: Quiz/Assignment/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Interpret** the basics about algorithms and learn how to analyse and design algorithms. | **PO1,PO2,PO3,PO4,PO5,PSO1** |
| **CO2** | **Choose** brute force, divide and conquer, dynamic programming and greedy techniques methods to solve computing problems. | **PO1,PO3,PO12,PSO1,PSO2** |
| **CO3** | **Interpret** the approach for solving problems using iterative method. | **PO2,PO3,PO5,PO12,PSO3** |
| **CO4** | **Demonstrate** the solution of complex problems using backtracking, branch and bound techniques. | **PO4,PO5,PO12,PO1,PSO2,PSO3** |
| **CO5** | **Classify** the different Computability classes of P, NP, NP-complete and NP-hard. | **PO5,PO12,PO4, PS01,PSO2,PSO3** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE11417 | Algorithm Design | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | 3 | 3 | 3 | 3 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | | |
| ADAMAS UNIVERSITYSCHOOL OF ENGINEERING AND TECHNOLOGYEND-SEMESTER EXAMINATIONName of the Program: BCA Semester: IVCode- CSE11417 Stream- CSETime: 03 Hrs.Paper title– Algorithm Design Total pages- 1Max. Marks: 50 Total no. of questions- 12Instructions:Attempt All Questions from Section A (Each Carrying 1 Marks); any Three Questions from Section B (Each Carrying 5 Marks). Any Two Questions from Section C (Each Carrying 10 Marks ).1. At top of sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam.2. Assumptions made if any, should be stated clearly at the beginning of your answer. 3. **All parts of a Question should be answered consecutively** | | | | |
| **SECTION A (Answer All questions) (5 x 1 = 5)** | | | | |
| 1. | **Identify** the number of minimum spanning tree of a complete graph having 5 vertices. | | **Ap** | **CO4** |
| 2. | **Enumerate** the number of sequences for Chain Multiplication of 5 matrices. | | **U** | **CO4** |
| ­­­ 3. | **Define** tight asymptotic bound. | | **R** | **CO1** |
| 4. | **What** will be the appropriate representation for T(n) = 3n2 + n log(n) | | **R** | **CO1** |
| 5. | **Which** algorithmic approach is used by Prim’s algorithm. | | **U** | **CO2** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** | |  | |
| 1. | **What** is the significance of ‘n0’ in defining any Asymptotic notation. Justify your answer.    f(n)  g(n)      n=n0 | | **U** | **CO1** |
| 2. | **Solve** the following recurrence relations to find out the complexity:  a) T(n) = 2 T(n/4) + √n log2(n) solve using Master’s Theorem  b) T(n) = T(n/3) + T(2n/3) + Θ(n) solve using Recursion Tree | | **Ap** | **CO2** |
| 3. | **Define** the basic concepts of backtracking with the help of neat flow diagram showing  “Dead End” and “Success”. Hence, solve 4-Queens and 8-Queens problem using the above Approach. | | **U** | **CO3** |
| 4. | **Explain** circuit satisfiability. Prove that circuit satisfiability is in NP | | **U** | **CO5** |
|  | **SECTION C (**Attempt any **Two Questions) (2 x 10 = 20)** | |  | |
| 1. | **Compare** Dynamic Approach from Divide & Conquer? Find out Minimum number of scalar multiplication required to multiply the following chain of matrices: A1 (5X15) , A2 (15X10), A3 (10X5), A4 (5X25) | | **Ap** | **CO2** |
| 2. | **Discuss** the amortized analysis of an aggregate method. Also give the procedural steps for the computation of an optimal parenthesization of a matrix-chain product whose dimensions are: A(10X20); B(20X50); C(50X1); D(1X100) | | **Create** | **CO4** |
| 3. | **Build** the basic properties of Greedy Approach to solve any problem? Solve activity Selection problem for the following data using Greedy method:   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Start time | 1 | 2 | 2 | 6 | 8 | 10 | 12 | 14 | | Finish time | 6 | 5 | 4 | 9 | 15 | 14 | 16 | 18 | | | **Ap** | **CO2** |

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| **CSE11418** | Operating System | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Computer Organization, Basic Data structure(list, tree, graph)** | | | | |
| **Co-requisites** | **High level programming Language** | | | | |

**Course Objectives:**

1. To introduce the main components of an OS & their function.
2. To develop the process management and scheduling.
3. To provide various issues in Inter Process Communication (IPC) and the role of OS in IPC.
4. To introduce the concepts and implementation Memory management policies and virtual memory.
5. To develop the working of an OS as a resource manager, file system manager, process manager, memory manager and I/O manager and methods used to implement the different parts of OS.
6. To provide the need for special purpose operating system with the advent of new emerging technologies.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Describe** and explain the fundamental components of a computer operating system.

CO2. **Define**, restate, discuss, and explain the policies for scheduling, deadlocks, memory

Management, synchronization, system calls, and file systems.

CO3. **Evaluate** the requirement for process synchronization and coordination handled by operating system.

CO4. **Design** and construct the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems.

CO5. **Identify** use and evaluate the storage management policies with respect to different storage management technologies. 6. Identify the need to create the special purpose operating system.

CO6. **Identify** the need to create the special purpose operating system.

**Catalog Description:**

This course will introduce the core concept of operating system such as system abstractions, mechanisms, and their implementations. The core of the course contains concurrent programming (threads and synchronization), inter process communication, and an introduction to distributed operating systems. The course is split into four sections: (1) Introduction, (2) Process and Thread Management, (3) Resource Management and Memory Management, and (4) I/O hardware and File Management. The course will consist of assigned reading, weekly lectures, a midterm and final term exam, and a sequence of programming assignments. The goal of the readings and lectures is to introduce the core concepts. The goal of the programming assignments is to give students some exposure to operating system code. Students are expected to read the assigned materials prior to each class, and to participate in in-class discussions.

**Course Content:**

**Unit I: 08 lecture hours**

**Introduction:** Introduction to OS, need of OS, types and evolution of OS, Operating System Services, User Operating System Interface, System Calls, Types of System Calls.

**Unit II: 08 lecture hours**

**Process:** Basic Concepts, Operations on Processes, Inter process communication, Process Scheduling: Scheduling Criteria, Scheduling Algorithms

**Unit III: 12 lecture hours**

**Process Co-ordination:** Process Synchronization: Critical Section, Synchronization Hardware Technique, Semaphores, Problems of Synchronization, Monitors.

Deadlocks: System Model, Mechanism for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock..

**Unit IV: 10 lecture hours**

**Memory Management:** Memory Management: Swapping, Memory partitions, Contiguous and non-contiguous memory allocation, Paging, Segmentation, Fragmentation.

Virtual Memory: Paging, Page Table, Demand paging, TLBs, Inverted Page Tables, Page Replacement Algorithm.

**Unit V: 07 lecture hours**

**Storage Management** : File System: File Concept, Access Methods, Directory Structure, protection, Implementing File Systems: File System Structure, Directory Implementation, Allocation Methods, Free  Space Management, Efficiency and Performance, Recovery

**Text Books:**

1. Operating System Concepts Essentials, 9th Edition by AviSilberschatz, Peter Galvin, Greg Gagne, Wiley Asia Student Edition.
2. Operating Systems: Internals and Design Principles, 5th Edition, William Stallings, Prentice Hall of India.

**Reference Books:**

1. Operating System: A Design-oriented Approach, 1st Edition by Charles Crowley, Irwin Publishing.
2. Operating Systems: A Modern Perspective, 2nd Edition by Gary J. Nutt, Addison-Wesley.
3. Design of the Unix Operating Systems, 8th Edition by Maurice Bach, Prentice-Hall of India.
4. Understanding the Linux Kernel, 3rd Edition, Daniel P. Bovet, Marco Cesati, O'Reilly and Associates.

**Modes of Evaluation: Quiz/Assignment/ Written Examination**

**Examination Scheme:**

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| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Describe** and explain the fundamental components of a computer operating system. | **PO1,PO2,,PO3,PSO2,PSO1** |
| **CO2** | **Define**, restate, discuss, and explain the policies for scheduling, deadlocks, memory management, synchronization, system calls, and file systems. | **PO1,PO2,,PO3,PSO2,PSO1** |
| **CO3** | **Evaluate** the requirement for process synchronization and coordination handled by operating system. | **PO1,PO2,,PO3,PSO2,PSO1** |
| **CO4** | **Design** and construct the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems | **PO1,PO2,,PO3,PSO2,PSO1** |
| **CO5** | **Identify** use and evaluate the storage management policies with respect to different storage management technologies. | **PO1,PO2,,PO3,PSO2,PSO1** |
| **CO6** | **Identify** the need to create the special purpose operating system. | **PO1,PO2,,PO3,PSO2,PSO1** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE11418 | Operating System | 3 | 3 | - | 3 | - | - | - | - | - | - | - | - | 3 | 3 | - |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | | |
| ADAMAS UNIVERSITYSCHOOL OF ENGINEERING AND TECHNOLOGYEND-SEMESTER EXAMINATIONName of the Program: BCA Semester: IVCode- CSE11418 Stream- CSETime: 03 Hrs.Paper title– Operating System Total pages- 1Max. Marks: 50 Total no. of questions- 12Instructions:Attempt All Questions from Section A (Each Carrying 1 Marks); any Three Questions from Section B (Each Carrying 5 Marks). Any Two Questions from Section C (Each Carrying 10 Marks).1. At top of sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam.2. Assumptions made if any, should be stated clearly at the beginning of your answer. 3. **All parts of a Question should be answered consecutively** | | | | |
| **SECTION A (Answer All questions) (5 x 1 = 5)** | | | | |
| 1. | **List** the different types of queue used in scheduling algorithm. | | **U** | **CO1** |
| 2. | **Explain** hit ratio in paging technique. | | **U** | **CO2** |
| ­­­ 3. | **Define** zombie process. | | **R** | **CO3** |
| 4. | **What** is dispatcher? | | **R** | **CO4** |
| 5. | **Give** example of round robin scheduling. | | **U** | **CO5** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** | |  | |
| 1. | **Explain** various states of a process with the help of a state transition diagram. | | **U** | **CO1** |
| 2. | **When** internal fragmentation occurs explain with an example. | | **R** | **CO2** |
| 3. | **Demonstrate** critical section Problem. Explain all the requirements of critical-section problem. | | **U** | **CO3** |
| 4. | **Why** “Message passing is time consuming as compared to shared memory”? | | **R** | **CO4 /CO5** |
|  | **SECTION C (**Attempt any **Two Questions) (2 x 10 = 20)** | |  | |
| 1. | **Build**  Gantt chart for Non-preemptive Priority-based and FCFS scheduling of the following processes:   |  |  |  |  | | --- | --- | --- | --- | | Process | Priority | Arrival Time | Burst Time | | P1 | 4 | 0 | 7 | | P2 | 3 | 1 | 4 | | P3 | 1 | 3 | 3 | | P4 | 2 | 4 | 2 |     Calculate Average waiting time and turnaround time. | | **Ap** | **CO4** |
| 2. | **a) Define** critical section Problem. Explain all the requirements of critical-section problem.  **b)** **What** is Semaphore? How can semaphore be used to achieve mutual exclusion? | | **R** | **CO4** |
| 3. | **a) Explain** the necessary and sufficient conditions for the occurrence of deadlock.  b) **Plan** the following state of a system.   |  |  |  |  | | --- | --- | --- | --- | | **Process** | **Allocation** | **Max. Demand** | **Available** | | P1 | 3 1 1 | 6 4 3 | 3 2 3 | | P2 | 1 0 4 | 3 0 6 | | P3 | 3 2 0 | 7 6 1 |  1. What is the content of Need Matrix?   Is the System is in safe state or in unsafe state using Banker’s algorithm. | | **U** | **CO5** |

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| **CSE11419** | Introduction to Computer Graphics | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basic knowledge of Computer system** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To introduce the use of the components of a graphics system and become familiar with building approach of graphics system components and algorithms related with them.

2. To learn the basic principles of 3-dimensional computer graphics.

3. To provide an understanding of how to scan convert the basic geometrical primitives, how to  
transform the shapes to fit them as per the picture definition.

4. To provide an understanding of mapping from a world coordinates to device coordinates,  
clipping, and projections.

5. To provide an understanding of curve representation and hidden surfaces along with the different color models.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Explain** software & hardware properties of graphics systems in general and detailed rasterization algorithms for line, circle, ellipse & polygons in particular.

CO2. **Illustrate** how to do ‘cut-paste’ operation on pictures using 2D clipping and generate modified/edited pictures using 2D/3D geometric transformation & parallel and perspective projection as needed.

CO3. **Explain** the general extension for 3D surfaces and also with basic colour models, such as RGB, CMY, YIQ, HSV.

CO4**. Classify** the hidden surfaces algorithms.

CO5. **Define** fractals and other self-similar features of objects and ray tracing models.

**Catalog Description:**

Computer Graphics refers to the representation and manipulation of image data by a computer. It is the sub-field of computer science which studies methods for digitally synthesizing and manipulating visual content. Students get an overview of two-dimensional transformation and viewing. Students get an exposure to three-dimensional geometry and representation of 3D objects. Students learn about the curve concept which is essential as not all objects in real life have flat surface. Students learn the different algorithms for hidden surface removal and about different color models.

**Course Content:**

**Unit I: 12 lecture hours**

**Computer graphics & graphics systems:** Overview of computer graphics, representing pictures, preparing, presenting & interacting with pictures for presentations. Visualization & image processing. RGB color model, direct coding, and lookup table. Storage tube graphics display, Raster scan display, 3D viewing devices, Plotters, printers, digitizers, Light pens etc. Active & Passive graphics devices.

**Scan conversion:** Points & lines, Line drawing algorithms; DDA algorithm, Bresenham’s line algorithm, Circle generation algorithm, Ellipse generating algorithm, scan line polygon, fill algorithm, boundary fill algorithm, flood fill algorithm.

**Unit II: 16 lecture hours**

**2D transformation & viewing:** Basic transformations: translation, rotation, scaling; Matrix representations & homogeneous coordinates, transformations between coordinate systems; reflection shear; Transformation of points, lines, parallel lines, intersecting lines. Viewing pipeline, Window to view port co-ordinate transformation, clipping operations, point clipping, line clipping, clipping circles, polygons & ellipse. Cohen and Sutherland line clipping, Sutherland-Hodgeman Polygon clipping, Cyrus-beck clipping method

**Three Dimension Geometry:** Introduction, 3D Geometry, Primitives and Transformation, Rotation about an Arbitrary Axis, Parallel Projection, Perspective Projection, Viewing Parameters, and Conversation to View Plan Coordinate, 3D Viewing Transformation, Special Projection.

**Unit III: 10 lecture hours**

**Curves:** Curve representation, surfaces, designs, Bezier curves, B-spline curves, end conditions for periodic B-spline curves, rational B-spline curves.

**Hidden surfaces :** Depth comparison, Z-buffer algorithm, Back face detection, BSP tree method, the Painter’s algorithm, scan-line algorithm; Hidden line elimination, wire frame methods , fractal - geometry.

**Unit IV:** 0**7 lecture hours**

**Color & shading models**: Light & color model, interpolative shading model, Texture.

**Introduction to Ray-tracing:** Human vision and color, Lighting, Reflection and transmission models.

**Text Books:**

1. Computer Graphics with Open GL, 4th Edition, Donald D. Hearn, M. Pauline Baker, Warren Carithers, Pearson Education
2. Computer Graphics using OPENGL, Third Edition,F.S. Hill, Pearson Education.

**Reference Books:**

1. Computer Graphics- Principles and Practice, Third Edition,[John F. Hughes](https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22John+F.+Hughes%22), [AndriesHYPERLINK "https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Andries+Van+Dam%22" Van Dam](https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Andries+Van+Dam%22), [James D. Foley](https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22James+D.+Foley%22), [Steven K. HYPERLINK "https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Steven+K.+Feiner%22"Feiner](https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Steven+K.+Feiner%22), Addison-Wesley

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Explain** software & hardware properties of graphics systems in general and detailed rasterization algorithms for line, circle, ellipse & polygons in particular. | **PO1,PO2,PO4** |
| **CO2** | **Illustrate** how to do ‘cut-paste’ operation on pictures using 2D clipping and generate modified/edited pictures using 2D/3D geometric transformation & parallel and perspective projection as needed | **PO1,PO2,PO4** |
| **CO3** | **Explain** the general extension for 3D surfaces and also with basic colour models, such as RGB, CMY, YIQ, and HSV. | **PO1,PO2,PO4,PO3** |
| **CO4** | **Classify** the hidden surfaces algorithms | **PO1,PO2,PO4,PO3** |
| **CO5** | **Define** fractals and other self-similar features of objects and ray tracing models. | **PO4** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE11419 | Introduction to Computer Graphics | 3 | 3 | 2 | 3 | - | - | - | - | - | - | - | **-** | - | - | - |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: IV Stream: CSE

PAPER TITLE: Introduction to Computer Graphics PAPER CODE: CSE11419

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

* 1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
  2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
  3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **What** is pixel? | **R** | **CO1** |
| 2. | **Define** ray tracing | **R** | **CO5** |
| ­­­ 3. | **What is** 2D scaling? | **R** | **CO2** |
| 4. | **What** is Back face detection? | **R** | **CO4** |
| 5. | **What is** color model? | **R** | **CO3** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Describe** the DDA line drawing algorithm. | **U** | **CO1** |
| 7. | **Explain** the different types of clipping techniques. | **U** | **CO2** |
| 8. | **Elucidate** the significance of fractals. | **U** | **CO5** |
| 9. | **Explain** the difference between RGB and CMY color model. | **U** | **CO3** |
|  | **SECTION C(Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Explain** in detail about 3D object representation. | **U** | **CO4** |
| 11. | **Write** short notes on Hidden surface problem. | **U** | **CO4** |
| 12. | **Distinguish** between parallel and perspective projection. | **An** | **CO5** |

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| **ECE12504** | Computer Network Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **FDM, TDM, Modulation** | | | | |
| **Co-requisites** | **Fundamentals of Digital Communication** | | | | |

**Course Objectives:**

1. To investigate the configuration of a network.
2. To enable students to enlist the components of a network
3. To explain the importance of protocols in data communication networks.
4. To compare protocols based on their attributes in a data network.
5. To enable the students for acquiring the fundamental knowledge of switching, routing, congestion control and security issues related to a network.

**Course Outcomes:**

On completion of this course, the students will be able to

1. **Relate** the basics of Computer Networks, OSI and TCP IP Layered architecture, Model the LAN and WAN configuration using different media.
2. **Demonstrate** and practice the application of various layers of the OSI and TCP/IP models as well as various LAN and WAN configurations
3. **Appraise** the application of layered architecture and network security issues
4. **Apply** Matrix the knowledge of layered architecture/models to practical computer networks as well as various encryption and de-cryption algorithms for securing networks.
5. **Demonstrate** and practice the application of OSI, TCP/IP Models, Firewalls, Bridges and Routers etc.
6. **Understand** the fundamentals concept of digital communication techniques and medium, layering in networks, topologies in a network, network security issue, and LAN Topologies.

**Catalog Description:**

This module introduces students to computer networks and concentrates on building a firm foundation for understanding Data Communications and Computer Networks. It is based around the OSI Reference Model that deals with the major issues in the bottom three (Physical, Data Link and Network) layers of the model. Students are also introduced to the areas of Network Security and Mobile Communications. This module provides the student with fundamental knowledge of the various aspects of computer networking and enables students to appreciate recent developments in the area.

**Course Content:**

1. Familiarization with Networking Components and devices: LAN Adapters, Hubs, Switches, Routers etc.
2. Familiarization with Transmission media and Tools: Co-axial cable, UTP Cable, Crimping Tool, Connectors etc.
3. To configure the IP address for a computer connected to LAN and to configure network parameters of a web browser for the same computer.
4. To develop programs for implementing / simulating routing algorithms for Ad hoc networks.
5. To install any one open source packet capture software like wire shark etc.
6. NIC Installation & Configuration (Windows/Linux)
7. Configure a Network topology using packet tracer software.
8. Implementation and study of stop and wait protocol
9. Implementation and study of Go back-N and selective repeat protocols
10. Implementation of Data Link Layer Error Detection Mechanism (Cyclic Redundancy Check)
11. Implement the data link layer farming methods such as character, character stuffing and bit stuffing.
12. Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table art each node using distance vector routing algorithm
13. Implementation of Data encryption and decryption
14. TCP/UDP Socket Programming
15. Implementation of a Prototype Multithreaded Server

**Text Books:**

1. B A. Forouzan, “Data Communication and Networking”, 4/e, McGraw Hill, 2006.
2. W Stallings, “Data and Computer Communication” –7/e Pearson
3. A Tanenbarum, “Computer Networks” –4th Edition, PHI, 2004/Pearson Education 4th Edition

**Reference Books:**

1. Jean Wairand - Communication Networks (A first Course) - Second Edition - WCB/McGraw Hill - 1998.
2. Leon-Garcia and Widjaja, “Communication Networks”, 2/e McGraw Hill, 2004.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

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| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Relate** the basics of Computer Networks, OSI and TCP IP Layered architecture, Model the LAN and WAN configuration using different media. | **PO1, PO3** |
| **CO2** | **Demonstrate** and practice the application of various layers of the OSI and TCP/IP models as well as various LAN and WAN configurations. | **PO2, PO3, PO7, PSO1** |
| **CO3** | **Appraise** the application of layered architecture and network security issues | **PO2, PO3, PO7** |
| **CO4** | **Apply** Matrix the knowledge of layered architecture/models to practical computer networks as well as various encryption and de-cryption algorithms for securing networks. | **PO1, PO2, PO3, PO7, PSO1** |
| **CO5** | **Demonstrate** and practice the application of OSI, TCP/IP Models, Firewalls, Bridges and Routers etc. | **PO1, PO2, PO3, PO5, PO7, PSO1** |
| **CO6** | **Relate** the fundamentals concept of digital communication techniques and medium, layering in networks, topologies in a network, network security issue, and LAN Topologies. | **PO1, PO3, PO5** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECE12504 | Computer Network Lab | 3 | 3 | 3 | - | 2 | - | 3 | - | - | - | - | - | 3 | - | - |

1=weakly mapped 2= moderately mapped 3=strongly mapped

**Model Question Paper**

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| **Name:**  **Enrolment No:** | |  | | |
| Course: ECE12504 – Computer Network Lab **Program: BCA Stream: CSE Semester: IV**  **Time: 03 hrs. Max. Marks:50** | | | | | |
| **Section A (Answer All the Questions) (5 x 10 = 50)** | | | | | |
| 1. | **Experiment with** Networking Components and devices: LAN Adapters, Hubs, Switches, Routers etc. | | **Ap** | **CO1** | |
| 2. | **Experiment with** Transmission media and Tools: Co-axial cable, UTP Cable, Crimping Tool, Connectors etc. | | **Ap** | **CO1** | |
| ­­­ 3. | **How** to configure the IP address for a computer connected to LAN and to configure network parameters of a web browser for the same computer. | | **An** | **CO6** | |
| 4. | **Develop** programs for implementing / simulating routing algorithms for Ad hoc networks. | | **Ap** | **CO3** | |
| 5. | **Organize** any one open source packet capture software like wire shark etc. | | **Ap** | **CO6** | |

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| **CSE12420** | Algorithm Design Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Programming and Data structures and High Level programming Language like C, Java and Python anyone.** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To develop a problem and design the solution for the problem.

2. To design and implement efficient algorithms for a specified application.

3. To provide the ability to identify and apply the suitable algorithm for the given real world problem

**Course Outcomes:**

On completion of this course, the students will be able to

1. **Analyze** the complexities of various problems in different domains.
2. **Identify** the problem given and design the algorithm using various algorithm

design techniques.

1. **Implement** various algorithms in a high level language
2. **Analyze** the performance of various algorithms.
3. **Compare** the performance of different algorithms for same problem.

**Catalog Description:**

Algorithmic study is a core part of Computer Science. This study caters to all possible applicable areas of Computer Science. This study includes observation, design, analysis and conclusion. Various types of algorithms have different notion of implementation according to their cost (in terms their time and space complexity). This study also includes refinement of one algorithm as per the applicability to real problems. Categorization of algorithms according to different method of design also includes in this course. It also compares the same algorithm using different algorithm design methods. For example, Knapsack problem can be solved in Greedy approach and Dynamic approach, both are optimization method. This course enables the students to think analytically while applying, designing an algorithm to solve a specific problem.

**Course Content:**

**Experiment 1:**

Implementation based on Divide and Conquer: Binary Search using Divide and Conquer approach, Quick sort and Merge Sort

**Experiment 2:**

Implementation based on Dynamic Programming : Implement all pair of Shortest path for a graph ( Floyed-Warshall Algorithm ), Dijkstra’s , Bellman Ford Algorithm and Implement Traveling Salesman Problem

**Experiment 3:**

Implementation based on Brunch and Bound :Implement 15 Puzzle Problem

**Experiment 4:**

Implementation based on Backtracking :Implement 8 Queen problem, Graph Coloring Problem, Hamiltonian Problem

**Experiment 5:**

Implementation based on Greedy method**:** Knapsack Problem and Job sequencing with deadlines, Minimum Cost Spanning Tree by Prim's Algorithm and Minimum Cost Spanning Tree by Kruskal's Algorithm

**Experiment 6:**

Implementation based on Graph Traversal Algorithm**:** Implement Breadth First Search (BFS) and Implement Depth First Search (DFS)

**Text Books:**

1. Introduction to Algorithms, 4TH Edition, Thomas H Cormen, Charles E Lieserson, Ronald L RivestAnd Clifford Stein, MIT Press/Mcgraw-Hill.
2. Fundamentals of Algorithms – E. Horowitz Et Al.

**Reference Books:**

1. Algorithm Design, 1ST Edition, Jon Kleinberg and Évatardos, Pearson.
2. Algorithm Design: Foundations, Analysis, And Internet Examples, Second Edition, Michael T Goodrich And Roberto Tamassia, Wiley.
3. Algorithms -- A Creative Approach, 3RD Edition, Udimanber, Addison-Wesley, Reading, MA.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Analyze** the complexities of various problems in different domains. | **PO1,PO2,PS01,PSO2** |
| **CO2** | **Identify** the problem given and design the algorithm using various algorithm design techniques. | **PO1,PO3, PS01,PSO2** |
| **CO3** | **Implement** various algorithms in a high level language | **PO2,PO3, PO4,PO5,PSO2** |
| **CO4** | **Analyze** the performance of various algorithms. | **PO4,PO3, PO5,PS01,PSO2** |
| **CO5** | **Compare** the performance of different algorithms for same problem. | **PO3,PO5,PS01,PSO2** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex problems | Modern tool usage | The engineer and society | Environment and sustainability | Ethics | Individual or team work | Communication | Project management and finance | Life-long Learning | Adequate strong skills in learning new programming environments, analyse and design algorithms for efficient computer-based systems | The ability to understand the evolutionary changes in computing, apply standard practices and strategies in software project | The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, lifelong learning and a zest for higher studies and also to act as a good citizen by inculcating in them moral values & ethics. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE12420 | Algorithm Design Lab | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | **-** | 3 | 3 | - |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | | |
| ADAMAS UNIVERSITYSCHOOL OF ENGINEERING AND TECHNOLOGYEND-SEMESTER EXAMINATIONName of the Program: BCA Semester: IVCode- CSE12420 Stream- CSETime: 03 Hrs.Paper title– Algorithm Design Lab Total pages- 1Max. Marks: 50 Total no. of questions- 5Instructions:Attempt All Questions from Section A (Each Carrying 1 Marks); any Three Questions from Section B (Each Carrying 5 Marks). Any Two Questions from Section C (Each Carrying 10 Marks)1. At top of sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam.2. Assumptions made if any, should be stated clearly at the beginning of your answer. 3. **All parts of a Question should be answered consecutively** | | | | |
| **SECTION A (**Attempt any **Five Questions)(5x10=50)** | | | | |
| 1. | **Develop** C code for Bellman Ford Algorithm and Implement Traveling Salesman Problem | | **Ap** | **CO4** |
| 2. | **Explain** Quick sort with an example using C program. | | **U** | **CO2** |
| ­­­ 3. | **Develop** 15 Puzzle Problem and implement by C program. | | **Ap** | **CO4** |
| 4. | **Demonstrate** the performance of Minimum Cost Spanning Tree by Prim's Algorithm and Minimum Cost Spanning Tree by Kruskal's Algorithm | | **U** | **CO5** |
| 5. | **Develop** Merge sort using divide and conquer strategy. | | **R** | **CO5** |

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| **CSE12421** | Operating System Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Problem Solving using scripting language** | | | | |
| **Co-requisites** | **---** | | | | |

**Course Objectives:**

1. To introduce students with the architecture of Unix OS.

2. To provide necessary skills for developing and debugging programs in UNIX environment. 3. To develop the ability to identify and apply the suitable algorithm for the given real world problem

**Course Outcomes:**

On completion of this course, the students will be able to

1. **Identify** Unix commands and shell programming Implement various algorithms in a high level language
2. **Build** ‘C’ program for process and file system management using system calls
3. **Choose** the best CPU scheduling algorithm for a given problem instance
4. **Identify** the performance of various page replacement algorithms
5. **Develop** algorithm for deadlock avoidance, detection and file allocation strategies.

**Catalog Description:**

Operating systems are the core part of every computing device to run any type of software. The increasing use of computing devices in all areas of life, lead to a variety of operating systems. As all operating systems share common principles. These principles are important for computer science students in their understanding of programming languages and software built on top of operating systems. The Operating System Laboratory, OS Lab is a course that will teach students about principles of operating systems using a constructivist approach and problem-oriented learning.

**Course Content:**

**Experiment 1:**

Basics of UNIX Commands

**Experiment 2:**

Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close.

**Experiment 3:**

Write programs using the I/O System calls of UNIX operating system (open, read, write, etc).

**Experiment 4:**

Given the list of processes, their CPU burst times. Display/print the Gantt chart forFCFS scheduling algorithm. Compute and print the average waiting time and average turnaround time

**Experiment 5:**

Given the list of processes, their CPU burst times and arrival times. Display the Gantt chart for SJF scheduling algorithm. Compute and print the average waiting time and average turnaround time.

**Experiment 6:**

Given the list of processes, their CPU burst times and time quantum. Display the Gantt chart for Round robin scheduling algorithm. Compute and print the average waiting time and average turnaround time.

**Experiment 7:**

Given the list of processes, their CPU burst times and arrival times. Display the Gantt chart for Priority scheduling algorithm. Compute and print the average waiting time and average turnaround time.

**Experiment 8:**

Develop application using Inter-Process Communication (using shared memory, pipes or message queues).

**Experiment 9:**

Implement the Producer-Consumer problem using semaphores (using UNIX system calls)

**Experiment 10:**

Implement Memory management schemes like paging and segmentation.

**Experiment 11:**

Implement Memory allocation schemes like First fit, Best fit and Worst fit.

**Experiment 12:**

Implementation based on Graph Traversal Algorithm**:** Implement Breadth First Search (BFS) and Implement Depth First Search (DFS)

**Text Books:**

1. Operating System Concepts Essentials, 9th Edition by AviSilberschatz, Peter Galvin, Greg Gagne, Wiley Asia Student Edition.
2. Operating Systems: Internals and Design Principles, 5th Edition, William Stallings, Prentice Hall of India.

**Reference Books:**

1. Universal Command Guide: For Operating Systems–April 15, 2002 ,byGuy Lotgering
2. The Easy Guide to Operating Systems, Larry Miller, 2012. Michael

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

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| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Identify** Unix commands and shell programming Implement various algorithms in a high level language | **PO1, PO2, PO3, PS02, PS03** |
| **CO2** | **Build** ‘C’ program for process and file system management using system calls | **PO1, PO3, PO4, PO12, PS01, PSO2** |
| **CO3** | **Choose** the best CPU scheduling algorithm for a given problem instance | **PO2, PO3, PO12, PS02, PS03, PSO1** |
| **CO4** | **Identify** the performance of various page replacement algorithms. | **PO1, PO3, PO5, PO12, PS02** |
| **CO5** | **Develop** algorithm for deadlock avoidance, detection and file allocation strategies | **PO3, PO12, PS02, PS03** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE12421 | Operating System Lab | 3 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | 3 | 2 | 3 | 3 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | | |
| ADAMAS UNIVERSITYSCHOOL OF ENGINEERING AND TECHNOLOGYEND-SEMESTER EXAMINATIONName of the Program: BCA Semester: IVCode- CSE12421 Stream- CSETime: 03 Hrs.Paper title– Operating System Lab Total pages- 1Max. Marks: 50 Total no. of questions- 5Instructions:Attempt All Questions from Section A (Each Carrying 1 Marks); any Three Questions fromSection B (Each Carrying 5 Marks). Any Two Questions from Section C (Each Carrying 10 Marks)1. At top of sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam.2. Assumptions made if any, should be stated clearly at the beginning of your answer. 3. **All parts of a Question should be answered consecutively** | | | | |
| **SECTION A (Answer All questions) (5 x 10=50)** | | | | |
| 1. | **Demonstrate** the priority-based non-preemptive CPU scheduling algorithms to find turnaround time and waiting time. | | **U** | **CO3** |
| 2. | **Develop** a shell script which will fork a child process. The child process will be another script instead of the same script of calling process. First one is the script, which will be parent process. | | **Ap** | **CO1** |
| ­­­ 3. | **Define** deadlock. Show deadlock detection using Banker’s algorithm. | | **R** | **CO5** |
| 4. | **Demonstrate** fork ( ), execlp ( ), wait ( ) and exit ( ) system call. | | **U** | **CO2** |
| 5. | **What** is paging. Demonstrate FIFO paging algorithm. | | **R** | **CO4** |

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| **CSE12422** | Computer Graphics Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Basic knowledge of Computer system** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To introduce the use of the components of a graphics system and become familiar with building approach of graphics system components and algorithms related with them.

2. To learn the basic principles of 3-dimensional computer graphics.

3. To provide an understanding of how to scan convert the basic geometrical primitives, how to  
transform the shapes to fit them as per the picture definition.

4. To provide an understanding of mapping from a world coordinates to device coordinates,  
clipping, and projections.

**Course Outcomes:**

On completion of this course, the students will be able to

**CO1. Interpret** the basic concepts of computer graphics.

**CO2. Design** scan conversion problems using programming.

**CO3. Apply** clipping and filling techniques for modifying an object.

**CO4. Interpret** the concepts of different type of geometric transformation of objects in 2D and 3D.

**CO5. Interpret** the practical implementation of modeling, rendering, viewing of objects in 2D.

**Catalog Description:**

Computer Graphics refers to the representation and manipulation of image data by a computer. It is the sub-field of computer science which studies methods for digitally synthesizing and manipulating visual content. Students get an overview of two-dimensional transformation and viewing. Students get an exposure to three-dimensional geometry and representation of 3D objects. Students learn about the curve concept which is essential as not all objects in real life have flat surface. Students learn the different algorithms for hidden surface removal and about different color models.

**Course Content:**

**List of Experiments:**

Write and execute C-code for the following programs:

1.Programming for generating lines,

2. Program for generating curves and rendered surfaces.

3.Interactive graphics programming: modeling and updating objects in an object hierarchy,

4. Graphics program for Flood-fill & Boundary-fill algorithm

5. Computer animation and realistic image synthesis.

6. Graphics program for Bezier curve.

7. Graphics program for B-Spline curve.

8. Graphics program video games

**Text Books:**

1. Computer Graphics with Open GL, 4th Edition, Donald D. Hearn, M. Pauline Baker, Warren Carithers, Pearson Education

2. Computer Graphics using OPENGL, Third Edition,F.S. Hill, Pearson Education.

**Reference Books:**

1. Computer Graphics- Principles and Practice, Third Edition,John F. Hughes, AndriesHYPERLINK "https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Andries+Van+Dam%22" Van Dam, James D. Foley, Steven K. HYPERLINK "https://www.google.co.in/search?tbo=p&tbm=bks&q=inauthor:%22Steven+K.+Feiner%22"Feiner, Addison-Wesley

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

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| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

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| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Interpret** the basic concepts of computer graphics | **PO1,PO2** |
| **CO2** | **Design** scan conversion problems using programming. | **PO2,PO1,PSO2, PSO1** |
| **CO3** | **Apply** clipping and filling techniques for modifying an object. | **PO1, PO2, PO3,PO4, PO6, PSO1, PSO3, PSO2** |
| **CO4** | **Interpret** the concepts of different type of geometric transformation of objects in 2D and 3D. | **PO1, PO2, PO3,PO4, PO6, PSO1, PSO3, PSO2** |
| **CO5** | **Interpret** the practical implementation of modeling, rendering, viewing of objects in 2D. | **PO1,PO2, PO3, PO4, PO6,PSO1, PSO3** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE12422 | Computer Graphics Lab | 3 | 3 | 2 | 2 | - | 2 | - | - | - | - | - | **-** | 3 | 2 | 3 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: IV Stream: CSE

PAPER TITLE: Computer Graphics Lab PAPER CODE: CSE12422

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 5 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 10 = 50)** | | | |
| 1. | **Develop** Programming for generating lines, | **AP** | **CO1** |
| 2. | **Develop** Program for generating curves and rendered surfaces. | **AP** | **CO2** |
| ­­­ 3. | **Develop** Graphics program for Flood-fill & Boundary-fill algorithm | **AP** | **CO3** |
| 4. | **Develop** Graphics program for Bezier curve. | **AP** | **CO5** |
| 5. | **Develop** Graphics program for B-Spline curve | **AP** | **CO5** |

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| **FAC11403** | Financial Accounting | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Concepts of Financial Accounting (Undergraduate level).** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. This course will enable the students to combine practice and theoretical knowledge of financial accounting.
2. The students of this course will be active learners and develop awareness of emerging trends in financial accounting,
3. The course will provide decision making skills to the students in the financial analysis context,
4. The students of this course will have the ability to identify and analyze financial accounting problems and opportunities in real life situations.

**Course Outcomes:**

1. **Build** an in-depth knowledge on the accounting procedures followed by the Companies, consolidation of their financial statements under miscellaneous situations.

2. **Assess** the accounting practice prevailing in the Corporate

3. **Find** a clear picture of liquidation procedures and reconstruction procedures of companies.

4. **Interpret** the provisions regarding accounting for shares and debentures

**Course Description:**

Financial Accounting refers to information describing the financial resources, obligations, and activities of an economic entity. The term financial position is used to describe an entity’s financial resources and obligations at one point in time, and the term results of operations is used to describe its financial activities during the year. This graduate course introduces the basic concepts and principles of accounting for preparing the financial statements such as Income statement (financial performance) and Balance Sheet (financial position). The course focuses on detailed understanding of accounting information system, accounting concepts, accounting principles, accounting cycle, recording of transactions, and financial statement concepts.

**Course Content:**

**Unit I: 8 Lecture hours**

Meaning And Scope Of Accounting- Introduction, Meaning Of Accounting, Objectives Of Accounting, Functions Of Accounting, Book-Keeping, Distinction Between Book-Keeping And Accounting, Sub-Fields Of Accounting, Users Of Accounting Information, Relationship Of Accounting With Other Disciplines, Limitations Of Accounting, Use Of Mathematics In Accounting, Accounting Concepts, Principles And Conventions

**Unit -II: 10 Lecture hours**

Basic Accounting Procedures In Journal Entries, Accounting Equation Approach, Traditional Approach, Ledgers, Trial Balance

**Module -III: 5 Lecture hours**

Subsidiary Books – Other Than Cash Book, Cash Book, Capital And Revenue Expenditures, Capital And Revenue Receipts, Contingent Assets And Contingent Liabilities.

**Module -IV: 5 Lecture hours**

Rectification Of Errors, Basis Of Inventory Valuation And Record Keeping, Average Due Date And Current Account.

**Module -V: 6 Lecture hours**

Bank Reconciliation Statement, Depreciation Accounting, Consignment And Joint Ventures

**Module -VI: 11 Lecture hours**

Preparation Of Final Accounts Of Sole Proprietors, Final Accounts Of Manufacturing Entities, Accounting Of Non-Profit Organisation, Preparation Of Receipt And Payment Account, Income And Expenditure Account And Balance Sheet..

**Text Books:**

1. Hanif& Mukherjee, Financial Accounting
2. Basu& Das , Financial Accounting(Vol-1), - Rabindra Library
3. B.K Banerjee, Financial Accounting- Concept, Analysis, Methods and Uses, P.H.I Learning Pvt. Ltd.

**References:**

1. Tulsian, Financial Accounting, Pearson.
2. Mukherjee and Mukherjee, Financial Accounting Volume I, Oxford Publication.

**Modes of Examination: Assignment/Quiz/Project/Presentation/Written Exam**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Build** an in-depth knowledge on the accounting procedures followed by the Companies, consolidation of their financial statements under miscellaneous situations. | **PO4, PSO2, PSO3** |
| **CO2** | **Assess** the accounting practice prevailing in the Corporate. | **PO4, PSO2, PSO3** |
| **CO3** | **Find** a clear picture of liquidation procedures and reconstruction procedures of companies. | **PO11, PSO3** |
| **CO4** | **Interpret** the provisions regarding accounting for shares and debentures. | **PO11, PSO2** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| FAC11403 | Financial Accounting | - | - | - | 2 | - | - | - | - | - | - | 2 | - | - | 3 | 3 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

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| --- | --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | | |
| Course: FAC11403 – Financial Accounting **Program: BCA Semester: V Stream: CSE**  **Time: 03 Hrs. Max. Marks: 50**  **Instructions:**  Attempt All Questions from **Section A** (Each Carrying 1Marks); any **Three Questions** from **Section B** (Each Carrying 5Marks)**.** Any **Two Questions from Section C** (Each Carrying 10 Marks)**.** | | | | |
| **SECTION A (Answer All Questions) (5 x 1 = 5)** | | | | |
| 1. | A company has decided to increase its existing share capital by making rights issue to its existing shareholders. The company is offering one new share for every two shares held by the shareholder. The market value of the share is Rs.240 and the company is offering one share at Rs.120 each. Calculate the value of the right. **What** should be the ex-right market price of a share? | | **Remembering** | **CO4** |
| 2. | **Why** does a company issue redeemable preference shares? | | **Remembering** | **CO4** |
| 3. | **Discuss**, in brief, some of the important provisions of Companies Act, 2013 relating to Corporate Social Responsibility. | | **Creating** | **CO2** |
| 4. | **Explain** some of the advantages of redemption of preferences shares by fresh issue of equity shares. | | **Understanding** | **CO4** |
| 5. | Is there any difference between Cumulative preference shares and non-cumulative preference shares? If yes, **identify** the differences. | | **Applying** | **CO4** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** | | | |
| 1. | **What** are the powers and functions of liquidators? | | **Remembering** | **CO3** |
| 2. | **Explain**, in detail, some of the important provisions of Companies Act 2013 relating to issue of bonus shares. | | **Understanding** | **CO4** |
| 3. | The following notes pertain to Sen Brothers Ltd.’s Balance Sheet as on 31.03.19:   |  |  | | --- | --- | | Equities and Liabilities | Rs. in lakhs | | Authorised Share Capital |  | | 20 crore equity shares of Rs.10 each | 20,000 | | Issue and subscribed capital: |  | | 10 crore equity shares of Rs.10 each | 10,000 | | 2 crore 11% cumulative preference shares of Rs.10 each | 2,000 | | Total | 12,000 | | Called and paid up capital: |  | | 10 crore equity shares of Rs.10 each, Rs.8 per share called and paid up | 8,000 | | 2 crore 11% cumulative preference shares of Rs.10 each, fully paid and called up | 2,000 | | Total | 10,000 | | Reserves and surplus: |  | | Capital Redemption reserve | 1,485 | | Securities premium | 2,000 | | General reserve | 1,040 | | Surplus, i.e., credit balance of Profit and loss account | 273 | | Total | 4,798 |   On 02.04.19, the company made the final call on equity shares @Rs.2 per share. The entire money was received in the month of April 2019. On 01.06.19, the company decided to issue to equity shareholders bonus shares at the rate of 2 shares for every 5 shares held. **Show** necessary journal entries for all the above mentioned transactions. Also prepare the notes on Share Capital and Reserves and Surplus relevant to the Balance Sheet of the company immediately after the issue of bonus shares. | | **Understanding** | **CO4** |
| 4. | (a) **What** is the purpose of preparing Consolidated Financial Statement? (3)  (b) **Distinguish** between Financial Asset and Financial Liability.  (2) | | **Remembering,**  **Analyzing** | **CO1**  **CO2** |
|  | **SECTION C** (Attempt any **Two Questions) (2 x 10 = 20)** | | | |
| 1. | X Ltd. went into liquidation on 31st December 2019. On that day, its Balance Sheet was as follows:   |  |  |  |  | | --- | --- | --- | --- | | LIABILITIES | Rs. | ASSETS | Rs. | | 2,000 10% cumulative Preference Shares of Rs. 100 each fully paid | 2,00,000 | Fixed Assets | 3,24,000 | | 10,000 equity shares of Rs. 10 each, Rs. 9 paid | 90,000 | Stock | 45,000 | | 10,000 equity shares of Rs. 10 each, Rs. 5 paid | 50,000 | Cash | 30,000 | | 10% debentures secured by floating charge | 1,00,000 | Other Current Assets | 1,30,000 | | Interest Outstanding on debentures | 10,000 | P/L Account | 70,500 | | Loan Secured on hypothecation of stock | 40,000 |  |  | | Sundry Creditors | 1,09,500 |  |  | | **TOTAL** | **5,99,500** | **TOTAL** | **5,99,500** |   Other Information:  (i) A liquidator was appointed with a remuneration of 2% on assets realized and 2% on amount distributed among ordinary unsecured creditors. Liquidation expense was Rs. 4,250. The dividend on preference shares are in arrear for two years.  (ii) Stock realized Rs. 30,000 and other assets excluding cash realized Rs. 4,10,000. All payments were made on 30th June 2019.  (iii) The details of the creditors are as follows:  Salaries & wages outstanding Rs. 10,000.; Liability for workman’s compensation Rs. 2,000; Owing to government for direct purchase Rs. 2,500; Due to government for taxes Rs. 10,000; Loan taken for payment of wages Rs. 5,000; Telephone Bills due Rs. 4,000; Managing Director’s Salary due Rs. 10,000; Balance is due to the suppliers of raw materials.  (iv) One Shareholder, holding 100 equity shares of Rs. 5 paid up, has been declared insolvent on the date of liquidation.  You are required to **construct** a Liquidator’s Final Statement of Accounts. | | **Creating** | **CO1** |
| 2. | Following are the Balance Sheet of A Ltd., B Ltd., C Ltd. as on 31-3-2020:  (All Amounts in ’000)   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Liabilities | A | B | C | Assets | A | B | C | | Equity Share of Rs.10 each | 1000 | 500 | 400 | Fixed Asset | 400 | 250 | 350 | | P/L Account | 300 | 200 | 100 | Shares in B Ltd. | 600 | - | - | | 10% Debentures of Rs.100 each | - | 100 | - | Shares in C Ltd. | 50 | 392 | - | | Current Liability | 300 | 150 | 90 | Debentures in B Ltd. | 100 | - | - | |  |  |  |  | Stock | 200 | 200 | 100 | |  |  |  |  | Debtors | 200 | 100 | 100 | |  |  |  |  | Cash | 50 | 8 | 40 | | **TOTAL** | **1600** | **950** | **590** | **TOTAL** | **1600** | **950** | **590** |   Other Information:  (i) A Ltd. acquire 30,000 shares in B Ltd. on 1.4.2019 and further 10,000 shares on 1.10.2019. A Ltd. also acquired 80% debentures of B Ltd. on 1.4.2019.  (ii) A Ltd. acquire 2,000 shares in C Ltd. on 1.4.2018 and again 2,000 shares on 1.10.2018.  (iii) B Ltd acquire 28,000 shares in C Ltd. on 1.4.2018 and further 4,000 shares in C Ltd. on 1.1.2019.  (iv) All the companies have proposed a dividend @ 10% on 31.3.2019.  (v) P/L Balance of B Ltd. and C Ltd. on 1.4.2018 were Rs. 1,00,000 and Rs. 50,000 respectively.  (vi) All the companies earned profit evenly during the year.  You are required to **construct** a Consolidated Balance Sheet as on 31-3-2020. | | **Creating** | **CO1** |
| 3. | X Ltd. issued 20,000, 9% convertible debentures of Rs. 100 each at par at the beginning of the financial year. The debentures are of 6 years term. The interest will be paid half-yearly during the entire tenure of the debenture. The debenture holders have the option to get 50% of the debentures to be converted into equity shares at the end of the 3rd year from the date of issue. The debenture holders, who do not opt for the conversion, will be paid 50% of the face value at the end of the 3rd year. The balance portion (for all) will be repaid at 10% premium after the expiry of the tenure of the debentures. At the time of issue of these debentures, the prevailing market rate of interest for similar debt instrument without the option of convertibility is 10%. It is assumed that no debenture holder has opted for conversion.  Present Value of Annuity is as under:   |  |  |  |  | | --- | --- | --- | --- | | Year | 1-3 | 4-6 | 7-12 | | Annuity @ 10% | 2.487 | 1.868 | 2.459 | | Annuity @ 5% | 2.723 | 2.353 | 3.787 |   Present Value of Re. 1 at the end of 3 years at 5% and 10% is 0.565 and 0.747 respectively.  Present Value of Re. 1 at the end of 6 years at 5% and 10% is 0.317 and 0.557 respectively.  You are required to **evaluate** and segregate the convertible debentures into debt and equity part. | | **Evaluating** | **CO4** |

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| --- | --- | --- | --- | --- | --- |
| **IST11401** | Management Information System | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basic knowledge about Management and Organization** | | | | |
| **Co-requisites** | **-** | | | | |

**Course Objectives:**

1. To Provide students with comprehensive knowledge and technical skills needed to successfully participate in and support the increasingly applied role of information technology in corporate decision making.
2. To Enable graduates to conceptualize and manage the specification, design and implementation of applied information systems.
3. To Provide the knowledge of contemporary issues related to the field of managing information systems.
4. To Develop knowledge and skills required to work effectively in a profession.
5. To Enhance self-confidence, ability to make proper decisions and effective communication.

**Course Outcomes:**

On completion of this course, the students will be able to

**CO1. Understand** the concepts of MIS and its environment.

**CO2. Demonstrate** the skills to perform information processing and able to analyze the planning function of management.

**CO3. Analyze** effective application of organizational behavior theories to effective management decisions.

**CO4. Classify** the complexities associated with implementation and management of Total Quality Management and its related components.

**Catalog Description:**

Information systems began as automation of office systems, and have grown into systems that assist managers to make decisions, systems that model successful business practices, and systems that transform the modern business into a knowledge-based enterprise.  This course will introduce information systems in the modern enterprise through a survey of information systems technologies and the way they affect management.  Although the course considers information technology, it focuses on management strategies, not technical issues.

**Course Content:**

**Module 1: 8 Lecture Hours**

Introduction to MIS, Function of MIS, Problems with MIS, and Knowledge requirements for MIS (7 areas), General system concept, DSS, EIS, ES, 4GL, IT & MIS: What is IT? Is computer essential for MIS? - Office supporting system(Whole) - Computer and MIS - Computer & MIS Data Processing System - Characteristics of DPS - Scope of Trans. Processing - Example of Sales Processing.

**Module 2: 14 Lecture Hours**

Information, Data & Communication – Concepts, Classification of Information, Characteristics of Information - Communication System, Communication methods, Information in an organization, Case StudyPlanning and Planning terms, Objectives, Problems, Type, Source of Planning Information System Concepts - Structure elements - Objectives & types Tools of planning, Introduction to Pert-CPM .

**Module 3: 12 Lecture Hours**

Working with people Model of Organization behavior, Social System & organization culture - Case Study - Industry - Academic - Employee Vs Employer - Employee Vs Organization, Industrial Behavior, formal and informal relationship, Job satisfaction, Change its resistance & management.

**Module 4: 11 Lecture Hours**

Concept of controlling management, Control cycle, Different Feedback loops, Principles of controlling, Multiple control feedback, Scope of management control - Total Quality Management, Case Study – TQM.

**Text Books:**

1.Management Information System : by T. Lucey, 8th Edition BPB Publication

**Reference Books:**

1. Organizational & Management : By Agarwal, Tata McGraw Hill Publishing Company Ltd

2. MIS – By W.S. Jawadekar, Tata McGraw Hill Publishing Company Ltd.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understand** the concepts of MIS and its environment. | **PO1, PO4, PO12** |
| **CO2** | **Demonstrate** the skills to perform information processing and able to analyze the planning function of management. | **PO1, PO2, PO3, PO9, PO11, PO12, PO4** |
| **CO3** | **Analyze** effective application of organizational behavior theories to effective management decisions. | **PO2, PO9, PO12, PO3, PO11** |
| **CO4** | **Classify** the complexities associated with implementation and management of Total Quality Management and its related components. | **PO1, PO2, PO4, PO9, PO12** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| IST11401 | Management Information System | 3 | 2 | 2 | 2 | - | - | - | - | - | - | 2 | 3 | - | - | - |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: V Stream: CSE

PAPER TITLE: Management Information System PAPER CODE: IST11401

Maximum Marks: 40 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1= 5)** | | | |
| 1. | **Discuss** role of Decision Making | **U** | **CO1** |
| 2. | **Enumerate** the basic elements of PERT. | **U** | **CO2** |
| ­­­ 3. | **Define** CP., | **R** | **CO3** |
| 4. | **What** is decision table? | **R** | **CO4** |
| 5. | **Give** the principles offer an activity optimistic time is 1day, pessimistic time is 8 days and most likely time is 3 days, then **what is the expected time?** . | **U** | **CO3** |
|  | **SECTION B (**Attempt any **Six Questions) (3x 5 = 15)** |  | |
| 6. | (a) **Explain** Strategic Planning.  (b) **How is this helpful** in Organization Building – explain with suitable example? | **U** | **CO1** |
| 7. | (a) **Define** Controlling.  (b) **Explain** the need for preparation of Quality Circle.  (c) **Explain** the stages of Quality Control Process. | **U** | **CO1, CO2** |
| 8. | **Elucidate** the factors influencing decision table | **R** | **CO3** |
| 9. | **Explain** with Example: i) MIS in healthcare ii) Job satisfaction in industry. | **An** | **CO4 /CO5** |
|  | **SECTION C (**Attempt any two **Questions) (10x 2= 20)** |  | |
| 10. | a) **Explain** Fulkerson’s rule for numbering the events of a network.  b) A construction project consists of 12 activities. The predecessor relationships are identified by their node numbers as indicated below: **(Ap)**   |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Activity | A | B | C | D | E | F | G | H | I | J | K | L | | Identification | (1,2) | (2,4) | (2,3) | (2,7) | (3,4) | (3,5) | (4,6) | (5,6) | (5,7) | (7,8) | (6,8) | (8,9) | | Duration | 5 | 4 | 4 | 7 | 3 | 3 | 4 | 3 | 4 | 5 | 7 | 2 |   Draw the network diagram and Determine Floats. | **U** | **CO4** |
| 11. | a) **What** is Organization Behavior? **(U)**  b) **How** MIS can be implemented in an Organization – **explain** with the help of suitable example. | **R** | **CO4** |
| 12. | **Distinguish** Total quality management. | **Ap** | **CO5** |

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| **CSE11423** | Artificial Intelligence | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Fundamentals of computer science, Operating system** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To provide the most fundamental knowledge of AI.
2. To make a computer that can learn, plan, and solve problems autonomously.
3. To give the students a perspective on the main research topics in AI i.e. problem solving, reasoning, planning, etc.
4. To enable students to acquire knowledge on some basic search algorithms for problem solving; knowledge representation and reasoning; pattern recognition; fuzzy logic; and neural networks.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1**. Define** Artificial Intelligence and its approach.

CO2. **Describe** propositional logic and inference engine.

CO3. **Execute** Planning withstate-space search.

CO4. **Implement** Bayesian networks and other temporal models.

CO5. **Explain** the types of Learning.

**Catalog Description:**

Artificial intelligence (AI) is a research field that studies how to realize the intelligent human behaviours on a computer. The ultimate goal of AI is to make a computer that can learn, plan, and solve problems autonomously. The main research topics in AI include: problem solving, reasoning, planning, natural language understanding, computer vision, automatic programming, machine learning, and so on. Of course, these topics are closely related with each other. For example, the knowledge acquired through learning can be used both for problem solving and for reasoning. In fact, the skill for problem solving itself should be acquired through learning. Also, methods for problem solving are useful both for reasoning and planning. Further, both natural language understanding and computer vision can be solved using methods developed in the field of pattern recognition.In this course, we will study the most fundamental knowledge for understanding AI. We will introduce some basic search algorithms for problem solving; knowledge representation and reasoning; pattern recognition; fuzzy logic; and neural networks.

**Course Content:**

**Unit I: 9 lecture hours**

Introduction – Agents – Problem Formulation – Uninformed Search Strategies – Heuristics – Informed Search Strategies – Constraint Satisfaction

**Unit II: 11 lecture hours**

Logical Agents – Propositional Logic – Inferences – First-Order Logic – Forward Chaining – Backward Chaining – Unification – Resolution

**Unit III: 9 lecture hours**

Planning With State-Space Search – Partial-Order Planning – Planning Graphs – Planning And Acting In The Real World

**Unit IV: 8 lecture hours**

Uncertainty Revision Of Probability - Probabilistic Reasoning – Bayesian Networks –Inferences In Bayesian Networks – Temporal Models – Hidden Markov Models

**Unit V: 8 lecture hours**

Learning From Observation - Inductive Learning – Decision Trees – Explanation Based Learning – Statistical Learning Methods - Reinforcement Learning

**Text Books:**

1. Artificial Intelligence – A Modern Approach, Second Edition, S. Russel and P. Norvig Pearson Education, 2003.

**Reference Books:**

1. Computational Intelligence: A Logical Approach”, David Poole, Alan Mackworth, Randy Goebel, First edition; Oxford university press, 2004.
2. Artificial Intelligence: Structures and Strategies for Complex Problem Solving”, Fourth Edition, G. Luger, Pearson Education, 2002.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Define** Artificial Intelligence and its approach. | **PO1, PO2** |
| **CO2** | **Describe** propositional logic and inference engine. | **PO3, PO4, PO7, PSO3** |
| **CO3** | **Execute** Planning withstate-space search. | **PO2, PO3, PO7, PO4, PO12, PSO3** |
| **CO4** | **Implement** Bayesian networks and other temporal models. | **PO2, PO3, PO4, PO12, PSO2, PSO3** |
| **CO5** | **Explain** the types of Learning. | **PO7, PO12, PSO2, PSO3** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE11423 | Artificial Intelligence | 3 | 2 | 2 | 2 | - | - | 2 | - | - | - | - | 2 | - | 2 | 3 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION**

Name of the Program: BCA Semester: V Stream: CSE

PAPER TITLE: Artificial Intelligence PAPER CODE: CSE11423

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **SECTION A (Attempt all the questions) (5 x 1 = 5)** | | | |
| 1. | **Define** FOL. | **R** | **CO1** |
| 2. | **Explain** CNF. | **U** | **CO2** |
| ­­­ 3. | **Define** BFS. | **U&R** | **CO5** |
| 4. | **Explain** DFS. | **R** | **CO1, CO4** |
| 5. | **What** is tensorflow? | **U** | **CO3** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Define** Artificial Intelligence. Mention its significance. | **Ap** | **CO3** |
| 7. | **Discuss** the dimensions of Artificial Intelligence in details. | **U** | **CO2** |
| 8. | **Explain** Unification technique in detail. | **An** | **CO5** |
| 9. | **What** is Turing test? | **R** | **CO3** |
|  | **SECTION C (**Attempt any **Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Explain** Water Jug Problem with suitable diagram and pseudocode for each step. | **E & R** | **CO4,**  **CO1, CO2** |
| 11. | **Discuss** the importance of Knowledge, Experience, Prediction and Decision Making in Artificial Intelligence. | **R & U** | **CO5** |
| 12. | **What** is the difference between AI and ML? | **U** | **CO3** |

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| **CSE11424** | Software Engineering | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Software/Hardware evolution at basic level** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To help the student to acquire knowledge of software evolution process.
2. To enable students modelling software project with appropriate metric and precision at workplace.
3. To give the students a perspective to software design process variables by exposing them to software specification document; and also, to enrich their software testing ability.
4. To enable students, acquire testing and quality assessment of model required for their profession.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Understand** the impact of software engineering.

CO2**. Communicate** with proper software model paradigm to pupils.

CO3**. Enhancement** of software metric engineering application in industry.

CO4. **Compare** Effectively testing and maintenance of software project.

CO5. **Classify** software metric analysis for an effective model.

**Catalog Description:**

There is a growing need for talented software developers across every industry. As technology advances, the ability to build quality software while considering design, development, security, and maintenance is sought after amongst all kinds of companies, from finance and banking to healthcare and national security.

Software Engineering applies the knowledge and theoretical understanding gained through computer science to building high-quality software products. As a maturing discipline, software is becoming more and more important in our everyday lives. Our software development and engineering professional program is Pace University’s response to the tremendous growth of the software development industry.

**Course Content:**

**Unit I: 8 lecture hours**

Software - Evolving role of it, a crisis on the Horizon and its Myths, Software process models: linear sequential model, prototyping model, RAD model, Evolutionary model, Formal methods model, Component based development, fourth generation techniques, Software development and requirement analysis using Agile, Scrum framework.

**Unit II: 10 lecture hours**

Management spectrum, people, problem, process, project and few Critical approach,

**Software Process and project metrics:** Measure, Metrics and Indicators, Process and Project Domain related metrics, Software Measurement, Reconciling of Different, Metrics Approaches, Software quality metrics, Validation management, **Software project planning:** Observations on estimation, Objectives of Project planning.

**Unit III: 8 lecture hours**

Resources: Software project estimation, Empirical models for estimation, Automated estimation tools, Risk management and Software risks: Identification, Risk projection, safety risks and hazards; RMMM plans, Risk management

**Unit IV: 9 lecture hours**

**Project scheduling and tracking:** Definition of task set and task network, Scheduling, earned value analysis, Tracking of Errors, Project planning, **Software quality assurance:** Concepts of Software Quality, Quality movement, Review of software quality assurance, Software reliability, Software quality metrics (MTTF, MTTR, MTBF ETC.)

**Unit V: 10 lecture hours**

S**oftware configuration management:** Object identification in software configuration, Configuring audit-SCM standards, **Analysis concepts and principles:** Requirement analysis, Software prototyping, Specification Review Analysis modeling, Data modeling, Functional modeling, Behavioral modeling, **Software design, Software testing techniques:** White box and black box testing, Software testing strategies - Unit testing, Integrating testing, System testing.

**Text Books:**

1. Software Engineering: A practitioner's approach, 8th Edition, Roger S. Pressman, McGraw Hill
2. An integrated approach to Software Engineering, Springer/Narosa Edition, Pankaj Jalote.

**Reference Books:**

1. Fundamentals of Software Engineering, 4th Edition, Rajib Mall, Prentice Hall, India.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | Understand the impact of software engineering. | **PO1,PO7** |
| **CO2** | Communicate with proper software model paradigm to pupils. | **PO1, PO2, PO3, PO4, PO11, PSO1, PSO2** |
| **CO3** | Enhancement of software metric engineering application in industry. | **PO1, PO12, PSO2** |
| **CO4** | Compare Effectively testing and maintenance of software project | **PO1, PO8, PO9, PO12, PSO3** |
| **CO5** | Classify software metric analysis for an effective model. | **PO1, PO9, PO12, PSO2,PO12** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO  10 | PO  11 | PO  12 | PSO1 | PSO2 | PSO3 |
| CSE11424 | Software Engineering | 3 | 2 | 2 | 1 | - | - | 1 | - | - | - | - | 2 | 1 | 3 | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: V Stream: CSE

PAPER TITLE: Software Engineering PAPER CODE: CSE11424

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **List** the steps involved in Software development life cycle? Write a note on it. | **U** | **CO1** |
| 2. | **Enumerate** the basic elements of Software requirement specification. | **U** | **CO2** |
| ­­­ 3. | **Define** Data coupling. | **R** | **CO3** |
| 4. | **What** is Software configuration management? | **R** | **CO4** |
| 5. | **Give** the principles of functional cohesion. | **U** | **CO4** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Describe** the stages of evolutionary model? | **U** | **CO1** |
| 7. | **Examine** the essential phases of iterative water fall model then what is the expected performance over traditional water fall model? | **Ap** | **CO2** |
| 8. | **Elucidate** the Black box testing and White box testing with suitable example. | **Ap** | **CO3** |
| 9. | **Explain** Scrum and agile application briefly explain it with proper example? | **U** | **CO4 /CO2** |
|  | **SECTION C (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Explain** in detail about V-model from end user point of view how it is useful in project design. | **U** | **CO4** |
| 11. | **Write** a Project estimation technique and estimation issues in project progress line.?Explain with a Case Study | **U** | **CO4** |
| 12. | **Distinguish** features of the factors i) Product metric, ii) Function point metric? | **U** | **CO5** |

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| **CSE11425** | Business Communication | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Knowledge of basic communication skills** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To help the students to learn about good communication skills.
2. To enable students to prepare for group discussion and interview.
3. To give the students a perspective to the usage of ICT for business communication.
4. To enable students acquire knowledge about different business letter drafting.

**Course Outcomes:**

On completion of this course, the students will be able to

1. **Understand** the importance of effective communication skills.
2. **Describe** the various skills for group discussion and interview.
3. **Explain** the different types of ICT techniques for business communication.
4. **Evaluate** the importance of business letter drafting.

**Catalog Description:**

Business communication is an integral course for preparing the students for interviews and group discussion. This course explains the importance and objective of Information and Communication Technology in business communication. It explains the different types of business letter drafting. It gives a detailed overview of benefits and advantages of business letter drafting.

**Course Content:**

**Unit I: 8 lecture hours**

Definition, Objectives, Stages of Communication, Essentials of Good/Effective Communication, Benefits of Good Communication, Gaps in Communication, Communication and Information Technology

**Unit II: 14 lecture hours**

Grammar: Sentence Structure, Idiomatic Usage of Language, Tenses, Direct & Indirect Parts of Speech, Active & Passive Voice, Vocabulary. Selected Short Stories: 2-3 classic short stories, 2-3 great short stories by Indian writers. Preparation for Job: Writing Applications for Jobs, Preparing Curriculum Vitae, Preparing for Interviews, Preparing for Group Discussions.

**Unit III: 12 lecture hours**

ICT for business communication, Word Processor, Telex, Fax (Facsimile),E-mail,(Electronic-mail),Voicemail,Internet,Multimedia &Advantages of Teleconferencing, Mobile Phone Conversation, Video Conferencing, SMS-answering machine, Telephone Answering Machine ‘Advantages and limitations of these types of communication

**Unit IV**: **11 lecture hours**

Drafting of business letter, Inquiries and replies, Placing and fulfilling orders, Complaints and follow-up Sales letters, Circular letters, Business Correspondence: Structure of a Letter, Inquiry Letter, Sales Letter, Order Letter, Complaints, Complaint Handling, and Telemarketing.

Government Correspondence: Noting, Routine Letter, Demo-Official Letter Memorandum, Circular, Telegrams, Newsletter.

**Text Books:**

1. Organizations - Structures, Processes and Outcomes; Richard h Hall; Prentice Hall India.

**Reference Books:**

1. Human Behavior at Work; John W New storm & Keith Davis; Tata McGraw Hill.
2. Business Communication: R.K. Madhukar; Vikas Publication

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understand** the importance of effective communication skills. | **PO6,PO10,PO12,PO9** |
| **CO2** | **Describe** the various skills for group discussion and interview. | **PO6,PO10,PO12,PO9** |
| **CO3** | **Explain** the different types of ICT techniques for business communication. | **PO2, PO6,PO10,PO12** |
| **CO4** | **Evaluate** the importance of business letter drafting. | **PO6,PO10,PO12** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE11425 | Business Communication | - | 1 | - | - | - | 3 | - | - | - | 3 | - | 3 | - | - | - |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: V Stream: CSE

PAPER TITLE: Business Communication PAPER CODE: CSE11425

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **What** is Business Communication? | **R** | **CO1** |
| 2. | **Enumerate** the benefits of good communication. | **R** | **CO1** |
| ­­­ 3. | **Define** Telex. | **R** | **CO3** |
| 4. | **What** is the role of ICT in business communication? | **R** | **CO3** |
| 5. | **Define** Tele-marketing. | **R** | **CO4** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Describe** the gaps in communication. | **U** | **CO1** |
| 7. | **Examine** the necessary ICT tools for business communication. | **U** | **CO3** |
| 8. | **Explain** any one type of business letter. | **U** | **CO4** |
| 9. | **Explain** with Example: i) Sales letter ii) Order letter | **U** | **CO4** |
|  | **SECTION C(Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Explain** in detail about advantages and limitations of ICT type of communication. | **U** | **CO3** |
| 11. | **Write** short notes on Newsletter drafting. | **U** | **CO4** |
| 12. | **Write** short notes on Complaint handling and its techniques. What are the rules for an effective group discussion? | **U** | **CO4, CO2** |

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| **CSE12426** | Artificial Intelligence Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Fundamentals of computer science, Operating system** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To provide the most fundamental knowledge of AI.
2. To make a computer that can learn, plan, and solve problems autonomously.
3. To give the students a perspective on the main research topics in AI i.e. problem solving, reasoning, planning, etc.
4. To enable students to acquire knowledge on some basic search algorithms for problem solving; knowledge representation and reasoning; pattern recognition; fuzzy logic; and neural networks.

**Course Outcomes:**

On completion of this course, the students will be able to

**CO1. Define** Artificial Intelligence and its approach.

**CO2. Describe** propositional logic and inference engine.

**CO3. Execute** Planning withstate-space search.

**CO4. Construct** Bayesian networks and other temporal models.

**CO5. Explain** the types of Learning.

**Catalog Description:**

Artificial intelligence (AI) is a research field that studies how to realize the intelligent human behaviours on a computer. The ultimate goal of AI is to make a computer that can learn, plan, and solve problems autonomously. The main research topics in AI include: problem solving, reasoning, planning, natural language understanding, computer vision, automatic programming, machine learning, and so on. Of course, these topics are closely related with each other. For example, the knowledge acquired through learning can be used both for problem solving and for reasoning. In fact, the skill for problem solving itself should be acquired through learning. Also, methods for problem solving are useful both for reasoning and planning. Further, both natural language understanding and computer vision can be solved using methods developed in the field of pattern recognition.In this course, we will study the most fundamental knowledge for understanding AI. We will introduce some basic search algorithms for problem solving; knowledge representation and reasoning; pattern recognition; fuzzy logic; and neural networks.

**Course Content:**

**Experiment No. 1.** WRITE A PROGRAM TO IMPLEMENT FORWARD CHAINING.

**Experiment No.2.** WRITE A PROGRAM TO IMPLEMENT BACKWARD CHAINING.

**Experiment No.3.** WRITE A PROGRAM TO IMPLEMENT UNIFICATION.

**Experiment No.4.** WRITE A PROGRAM TO IMPLEMENT RESOLUTION

**Experiment No.5.** WRITE A PROGRAM TO IMPLEMENT STATE SPACE SEARCH.

**Experiment No.6.** WRITE A PROGRAM TO IMPLEMENT BFS.

**Experiment No.7.** WRITE A PROGRAM TO IMPLEMENT TRAVELLING SALESMAN PROBLEM.

**Text Books:**

1. Artificial Intelligence – A Modern Approach, Second Edition, S. Russel and P. Norvig Pearson Education, 2003.

**Reference Books:**

1. Computational Intelligence: A Logical Approach”, David Poole, Alan Mackworth, Randy Goebel, First edition; Oxford university press, 2004.

2. Artificial Intelligence: Structures and Strategies for Complex Problem Solving”, Fourth Edition, G. Luger, Pearson Education, 2002.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Define** Artificial Intelligence and its approach. | **PO1, PO2. PO6** |
| **CO2** | **Describe** propositional logic and inference engine. | **PO2, PO3, PO4, PO7** |
| **CO3** | **Execute** Planning withstate-space search. | **PO4, PO12** |
| **CO4** | **Construct** Bayesian networks and other temporal models. | **PO12, PSO2, PSO3** |
| **CO5** | **Explain** the types of Learning. | **PSO2, PSO3** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE12426 | Artificial Intelligence Lab | 1 | 2 | 2 | 1 | - | - | 1 | - | - | - | - | 1 | - | 2 | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION**

Name of the Program: BCA Semester: V Stream: CSE

PAPER TITLE: Artificial Intelligence Lab PAPER CODE: CSE12426

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 4 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.

2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.

3. Assumptions made if any, should be stated clearly at the beginning of your answer.

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| --- | --- | --- | --- |
| **SECTION A (4x12.5=50)** | | | |
| 1. | **WRITE** A PROGRAM TO BUILD FORWARD CHAINING. | **An** | **CO1** |
| 2. | **WRITE** A PROGRAM TO BUILD TRAVELLING SALESMAN PROBLEM | **An** | **CO2** |
| 3. | **WRITE** A PROGRAM TO BUILD STATE SPACE SEARCH. | **Ap** | **CO3** |
| 4. | **WRITE** A PROGRAM TO BUILD UNIFICATION. | **U** | **CO2, CO5** |

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| **CSE12427** | Software Engineering Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Software/Hardware evolution at basic level** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To help the student to acquire knowledge of software evolution process.
2. To enable students modelling software project with appropriate metric and precision at workplace.
3. To give the students a perspective to software design process variables by exposing them to software specification document; and also, to enrich their software testing ability.
4. To enable students, acquire testing and quality assessment of model required for their profession.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Understand** the impact of software engineering.

CO2**. Communicate** with proper software model paradigm to pupils.

CO3. **Enhancement** of software metric engineering application in industry.

CO4. **Analyse** testing and maintenance of software project.

CO5. **Classify** software metric analysis for an effective model.

**Catalog Description:**

There is a growing need for talented software developers across every industry. As technology advances, the ability to build quality software while considering design, development, security, and maintenance is sought after amongst all kinds of companies, from finance and banking to healthcare and national security.

Software Engineering applies the knowledge and theoretical understanding gained through computer science to building high-quality software products. As a maturing discipline, software is becoming more and more important in our everyday lives. Our software development and engineering professional program is Pace University’s response to the tremendous growth of the software development industry.

**Course Content:**

|  |
| --- |
| 1. Development of requirements specification.  2. Function oriented design using SA/SD.  3. Object-oriented design using UML.  4. Test case design, implementation using Java and testing.  5. Use of appropriate CASE tools and other tools such as configuration management tools.  6. Program analysis tools in the software life cycle.  7. State machine diagram in MS-Visio.  8. UML diagram in MS-Visio.  9. Use case diagram in MS-Visio. |

**Text Books:**

1. Software Engineering: A practitioner's approach, 8th Edition, Roger S. Pressman, McGraw Hill

2. An integrated approach to Software Engineering, Springer/Narosa Edition, PankajJalote.

**Reference Books:**

1. Fundamentals of Software Engineering, 4th Edition, Rajib Mall, Prentice Hall, India.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understand** the impact of software engineering. | **PO1, PO11,PO10** |
| **CO2** | **Communicate** with proper software model paradigm to pupils. | **PO1, PO2, PO3, PO11, PSO2** |
| **CO3** | **Enhancement** of software metric engineering application in industry. | **PO1, PO12, PO7, PSO2** |
| **CO4** | **Analyse** effectively testing and maintenance of software project. | **PO1, PO9, PO12, PO7, PSO3** |
| **CO5** | **Classify** software modelling Structure and software metric Procedures to the Project. | **PO1, PO9, PO12, PSO2,PO12** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE12427 | Software Engineering Lab | 3 | 2 | 2 | - | - | - | 2 | - | - | - | 2 | 2 | - | 3 | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: V Stream: CSE

PAPER TITLE: Software Engineering Lab PAPER CODE: CSE12427

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 4 = 20)** | | | |
| 1. | **List** the Function oriented design using SA/SD? Write a note on it. | **U** | **CO1** |
| 2. | **Enumerate** the basic elements of UML diagram for hospital management system. | **U** | **CO2** |
| ­­­ 3. | **Define** Data coupling. | **R** | **CO3** |
| 4. | **What** is Program analysis tools in the software life cycle? | **R** | **CO4** |
| 5. | **Give** the principles of SRS document for ATM. | **U** | **CO4** |
|  | **SECTION B (**Attempt any **Six Questions) (6 x 5 = 30)** |  | |
| 6. | **Describe** the stages of sequence diagram to withdraw money from ATM? | **U** | **CO1** |
| 7. | **Examine** the essential phases of UML modelling? | **Ap** | **CO2** |
| 8. | **Elucidate** the state machine diagram for chocolate vending m/c in ms visio. | **Ap** | **CO3** |
| 9. | **Explain** Scrum and agile application briefly explain it with proper example? | **U** | **CO4 /CO2** |
| 10. | **Explain** in detail about test case design project design. | **U** | **CO4** |
| 11. | **Write** a Project estimation technique and estimation issues in project progress line.?Explain with a Case Study | **U** | **CO4** |
| 12. | **Distinguish** features of the Student, teacher UML class in a university? | **An** | **CO5** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CSE14428** | PROJECT -I | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -60** | **0** | **0** | **6** | **4** |
| **Pre-requisites/Exposure** | **Basic idea of the required subjects** | | | | |
| **Co-requisites** |  | | | | |

**Course Objectives:**

1. To be able to design, develop, document, and test software using current techniques.

2. To understand the fundamentals of computer architecture and computing theory.

3. To be able to solve problems working in group settings.

4. To demonstrate the ability to give presentations and write technical reports.

5. To demonstrate understanding of the importance of social and ethical issues related to the profession.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1**. Identify** a real world problem

CO2. **Utilize** the modern tools to solve the problems

CO3. **Discuss** in a group to promote team spirit and leadership quality among the students

CO4. **Plan** a projects involving both technological aspects and finance

CO5. **Identify** newer areas of in-depth study and research and lifelong learning

**Catalog Description:**

The course encourages students to take project works that are based on current trends and technologies in various subjects, which will augment the theory subjects. The students will form a group to do their project work. This teaming is to encourage team spirit and to insist the importance of team work. The students typically undergo group formation, finalization of area of work, testing, generation and verification of results, and possible research publication procedure.

**Course Content:**

The Evaluation of the project work are to be carried out in the following way:

1. In-depth study of a topic proposed by the supervisor

2. Continuous Evaluation through guide.

3. An open pre-submission seminar by the student.

4. End-semester University Examination (An open seminar followed by a Vivavoce)

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Investigate** a real world problem | **PO2,PO3,PSO1** |
| **CO2** | **Utilize** the modern tools to solve the problems | **PO2,PO3,PSO1** |
| **CO3** | **Discuss** in a group to promote team spirit and leadership quality among the students | **PO1, PO2, PO3, PO9, PSO2** |
| **CO4** | **Plan** a projects involving both technological aspects and finance | **PO1, PO2, PO3,PO11, PSO1** |
| **CO5** | **Identify** newer areas of indepth study and research and lifelong learning | **PO1, PO12,PSO1, PSO2** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE14428 | Project -I | 3 | 3 | 3 | - | - | - | - | - | 2 | - | 2 | 2 | 3 | 2 | - |

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| **MKT12403** | E-commerce & Applications | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Web-Technology** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To understand terms related to database design and management.

2. To understand the objectives of data and information management.

3. To assess data and information requirements.

4. To understand the economic structure for selling items.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Describe** the characteristics of database and the architecture of Database system.

CO2. **Design** Entity-Relationship Model for enterprise level databases

CO3**. Develop** the database and provide restricted access to different users of database

CO4**. Analyze** various patterns of user procurement patterns

**Catalog Description:**

E-Commerce (electronic commerce) is an area which is used in various fields of business like wholesale, retail as well as manufacturing unit. eCommerce is a subset of the e-business that concerns commerce. The activity of the exchange of goods and services with some of the other kind of payment methods can be intended as commerce. eCommerce world is an application of information sharing among business trading basically online commercial transaction with clients. Now eCommerce modules or plugins are included in all types wordpress development company.

**Course Content:**

**Unit I: 07 lecture hours**

E-commerce: The revolution is just beginning, Ecommerce : A Brief History, Understanding E-commerce: organizing Themes

**Unit II: 16 lecture hours**

E-commerce Business Models, Major Business to Consumer (B2C) business models, Major Business to Business (B2B) business models, Business models in emerging E-commerce areas, How the Internet and the web change business: strategy, structure and process, The Internet: Technology Background, The Internet Today, Internet II- The Future Infrastructure, The World Wide Web, The Internet and the Web : Features

**Unit III: 10 lecture hours**

Building an E-commerce Web Site: A systematic Approach, The e-commerce security environment, Security threats in the e-commerce environment, Technology solution, Management policies, Business procedures, and public laws, Payment system, E-commerce payment system, Electronic billing presentment and payment.

**Unit IV: 12 lecture hours**

Consumer online: The Internet Audience and Consumer Behaviour, Basic Marketing Concepts, Internet Marketing Technologies, B2C and B2B E-commerce marketing and business strategies, The Retail sector, Analyzing the viability of online firms, E-commerce in action: E-tailing Business Models, Common Themes in online retailing, The service sector: offline and online, Online financial services, Online Travel Services, Online career services.

**Text Books:**

1. “ S. J. Joseph, E-Commerce: an Indian perspective” PHI

2. “ . Kenneth C. Laudon, E-Commerce : Business, Technology, Society” 4th Edition, Pearson

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Describe** the characteristics of database and the architecture of Database system. | **PO1,PO8,PSO2** |
| **CO2** | **Design** Entity-Relationship Model for enterprise level databases. | **PO1, PO3, PO4, PSO1** |
| **CO3** | **Develop** the database and provide restricted access to different users of database. | **PO1, PO3, PO4, PO2,PSO1, PSO2** |
| **CO4** | **Analyze** various patterns of user procurement patterns. | **PO3, PO4,PSO1, PSO2** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| MKT12403 | E-commerce & Applications | 3 | 2 | 3 | 3 | - | - | - | 2 | - | - | - | - | 3 | 2 | - |

1=weakly mapped 2= moderately mapped 3=strongly mapped



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: VI

Stream: CSE

PAPER TITLE: E-commerce & Applications

PAPER CODE: MKT12403

Maximum Marks: 40 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 02

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.

2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.

3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **What** are the various components of electronic commerce applications? | **R** | **CO1** |
| 2. | **What** are the various components of electronic commerce applications? | **R** | **CO2** |
| ­­­ 3. | **What** are the characteristics of internet-based EDI? | **R** | **CO4** |
| 4. | **What** are the classifications of E-commerce field by the nature of the transactions? | **R** | **CO3** |
| 5. | **Why** do the companies usually choose to implement SAP? | **R** | **CO3** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **What** are the key technologies for B2B E-commerce? Explain architectural models of B2B E-commerce. | **R** | **CO2** |
| 7. | **Describe** the functional requirements for online selling and what specialized services and servers perform these functions. | **U** | **CO3** |
| 8. | **Who** are the stakeholders in E-Commerce information system? Explain the benefits and limitations of E-commerce. | **R** | **CO4** |
| 9 | **Explain** the concept of “Business Content” in SAP Business Information Warehouse. | **U** | **CO1** |
|  | **SECTION C (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | a. Once a company has acquired customer, the key to maximizing revenue is keeping them. **Explain** how e-commerce is helpful in customer retention?  b. **What** are the security issues of E-commerce? 5+5=10 | **Ap & U** | **CO2** |
| 11. | a. **Explain** the concept of business process reengineering and its relationship with the productivity paradox and ERP.  b. **What** is E-shopping? What are the advantages and disadvantages of e-shopping?5+5=10 | **U & R** | **CO3** |
| 12. | a. **What** is EDI? Discuss its layered structure?  b. **What** is e-payment? Why is orientation and standardization required for e-payment businesses? 5+5=10 | **R** | **CO4** |

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| **CSE11429** | Cyber Security | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Cryptography** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To understand of information assurance as practiced in computer operating systems, distributed systems, networks and representative applications.
2. To demonstrate the familiarity with prevalent network and distributed system attacks, defences against them, and forensics to investigate the aftermath.
3. Appraise a basic understanding of cryptography, how it has evolved, and some key encryption techniques used today.
4. Examine security policies (such as authentication, integrity and confidentiality), as well as protocols to
5. Evaluate such policies in the form of message exchanges.

**Course Outcomes:**

|  |  |
| --- | --- |
| CO1 | **Understand** the basics of System and Network Vulnerability Scanning. |
| CO2 | **Demonstrate** and practice the application of Network Protection tools. |
| CO3 | **Appraise** the application of different types of tools against web vulnerabilities. |
| CO4 | **Examine** Cyber Crime and Law. |
| CO5 | **Evaluate** Cyber Crime Investigation**.** |

**Course Description:**

Information Technology systems need to ensure the confidentiality, integrity, and availability of information. This course introduces students the principles of network and operating system security through hands-on exploration. Students learn how to harden an operating system as well as secure the network by implementing technologies such as firewalls, Virtual Private Networks (VPN), and Intrusion Detection Systems (IDS).

**Course Content:**

**Unit I: 9 lecture hours**

**Module 1:**

**Systems Vulnerability Scanning:** Open Port / Service Identification, Banner / Version Check, Traffic Probe, Vulnerability Probe, Vulnerability Examples, OpenVAS, Metasploit.

**Networks Vulnerability Scanning:** Netcat, Socat, understanding Port and Services tools - Datapipe, Fpipe, WinRelay, Network Reconnaissance – N map, THC-A map and System tools. **Network Sniffers and Injection tools :**Tcp dump and Win dump, Wireshark, Ettercap

**Unit II: 9 lecture hours**

**Network Protection tools :** Firewalls and Packet Filters, Firewall Basics, Comparison between Packet Filter and Firewall, Protection mechanism of Firewall, Packet Characteristic to Filter, Stateless and Stateful Firewalls, Network Address Translation (NAT) and Port Forwarding, the basic of Virtual Private Networks, Linux Firewall, Windows Firewall, [Snort - Network Intrusion Detection and Prevention System](https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwj9l-_K7_jTAhUNTo8KHdCTAhgQFggnMAA&url=https%3A%2F%2Fwww.snort.org%2F&usg=AFQjCNGcM-QbwviBIcCdsQyHnySpBKzvDA&sig2=PM8STvgTGHcJLMM-FJ_TQg)

**Unit III: 9 lecture hours**

**Protection tools against web vulnerabilities:** Nikto, W3af, HTTP utilities - Curl, OpenSSL and Stunnel, Application Inspection tools – Zed Attack Proxy, Sql map, Damn Vulnerable Web App (DVWA), Webgoat

**Password Cracking and Brute-Force Tools:** John the Ripper, L0htcrack, Pwdump, HTC-Hydra

**Unit IV: 9 lecture hours**

**Cyber Crime and law:**Cyber Crimes, Types of Cybercrime, Hacking, Attack vectors, Cyberspace and Criminal Behavior, Clarification of Terms, Traditional Problems Associated with Computer Crime, Introduction to Incident Response, Digital Forensics, Computer Language, Network Language, Realms of the Cyber world, A Brief History of the Internet, Recognizing and Defining Computer Crime, Contemporary Crimes, Computers as Targets, Contaminants and Destruction of Data, Indian IT ACT 2000. 10

**Unit V: 9 lecture hours**

**Cyber Crime Investigation :** Firewalls and Packet Filters, password Cracking, Keyloggers and Spyware, Virus and Warms, Trojan and backdoors, Steganography, DOS and DDOS attack, SQL injection, Buffer Overflow, Attack on wireless Networks

|  |  |
| --- | --- |
| **Text Books:** | |
| 1 | “Anti-Hacker Tool Kit (Indian Edition)”, Mike Shema, Publication McGraw Hill |
| 2 | " Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives”, Nina Godbole and SunitBelpure, Publication Wiley |

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understand** the basics of System and Network Vulnerability Scanning. | **PO1, PSO1** |
| **CO2** | **Demonstrate** and practice the application of Network Protection tools. | **PO3, PO5, PO1, PO6** |
| **CO3** | **Appraise** the application of different types of tools against web vulnerabilities. | **PO3, PO5, PSO1, PSO2** |
| **CO4** | **Examine** Cyber Crime and Law. | **PO1, PO6, PO9, PSO1, PSO2** |
| **CO5** | **Evaluate** Cyber Crime Investigation**.** | **PO3, PO5, PO6, PO9,PSO1, PSO2** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE11429 | Cyber Security | 3 | - | 2 | - | 2 | 3 | - | - | 2 | - | - | -  - | 3 | 2 | - |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA Semester: VI Stream: CSE

PAPER TITLE: Cyber Security PAPER CODE: CSE11429

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **Describe** the OpenSSL and Stunnel. | **U** | **CO1** |
| 2. | **Explain** the HTC-Hydra . | **Evaluate** | **CO1** |
| 3. | **Describe** Cyber Crimes | **U** | **CO1** |
| 4. | **Explain** Digital Forensics. | **Evaluate** | **CO2** |
| 5. | **Describe** Contaminants and Destruction of Data | **U** | **CO2** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Write** Firewalls and Packet Filters | **Ap** | **CO1** |
| 7. | **Examine** Steganography | **Ap** | **CO2** |
| 8. | **Describe** DOS and DDOS attack. | **U** | **CO6** |
| 9. | **Describe** with Example: i) XSS attack ii) Sql injection | **U** | **CO3, CO5** |
|  | **SECTION C (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Write** the steps of IT assessments or audits | **Ap** | **CO2** |
| 11 | **Write** the steps of Cross-site scripting (XSS). | **Ap** | **CO4** |
| 12. | **Describe** SQL injection and Cross-Site Request Forgery (CSRF) in details. | **U** | **CO3** |

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| **CSE15430** | Comprehensive Viva | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Willing to knowledge acquisition** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To Give an overview of emerging technology and relate to subject.
2. To enable students to improve their reasoning ability.
3. To give the students a outline of technical question.
4. To expound idea dissemination for a new technology by assessment of pupilknowledge.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1**. Understand** importance of knowledge acquisition.

CO2**. Compare** the real-life scenario, based on viva question.

CO3. **Classify** the practical implementation with emerging application.

CO4**. Analyse** understanding in technology up gradation.

**Catalog Description:**

The course tests the technical knowledge acquired during the study, spoken skills, and the ability to think logically under time pressure. The course proves extremely useful for placement interviews

**Course Content:**

Scientific approach to resolve open end question, Theoretical Vs Practical exploration, in research paradigms, epistemology and ontology in management research, positivism vs. interpretivism, subjectivism vs. objectivism.

Foundations of confidence building in answering question, Categories of theory, theory building vs. theory testing, conceptualization and hypothesis testing. Analyze the conformity of the system to the functional requirements Appreciate importance of fundamental knowledge and its application.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | Understand the vital feature behind comprehensive viva. | **PO1, PO4, PO3,PO5,PO9,PSO1,PSO2** |
| **CO2** | Compare the real-life scenario, based on viva question. | **PO10, PO2, PO3,PO5,PSO1,PSO2, PSO4** |
| **CO3** | Classifythe practical implementation with emerging application. | **PO1, PO12, PO2, PO3,PO5,PO11,PSO1,PSO2,PSO3** |
| **CO4** | Analyse understanding in technology up gradation. | **PO1, PO2, PO3,PO5, PO4, PO10 PSO1,PSO2, PSO3** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE15430 | Comprehensive Viva | 3 | 3 | 3 | 2 | 3 | - | - | - | - | 2 | - | - | 3 | 3 | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ECS33462** | PROJECT -II | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours - 120** | **0** | **0** | **12** | **8** |
| **Pre-requisites/Exposure** | **Basic idea of the required subjects** | | | | |
| **Co-requisites** |  | | | | |

**Course Objectives:**

1. To be able to design, develop, document, and test software using current techniques.

2. To understand the fundamentals of computer architecture and computing theory.

3. To be able to solve problems working in group settings.

4. To demonstrate the ability to give presentations and write technical reports.

5. To demonstrate understanding of the importance of social and ethical issues related to the profession.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1**. Identify** a real world problem

CO2. **Utilize** the modern tools to solve the problems

CO3. **Discuss** in a group to promote team spirit and leadership quality among the students

CO4. **Plan** a projects involving both technological aspects and finance

CO5. **Identify** newer areas of in depth study and research and lifelong learning

**Catalog Description:**

The course encourages students to take project works that are based on current trends and technologies in various subjects, which will augment the theory subjects. The students will form a group to do their project work. This teaming is to encourage team spirit and to insist the importance of team work. The students typically undergo group formation, finalization of area of work, testing, generation and verification of results, and possible research publication procedure.

**Course Content:**

The Evaluation of the project work are to be carried out in the following way:

1. In-depth study of a topic proposed by the supervisor

2. Continuous Evaluation through guide.

3. An open pre-submission seminar by the student.

4. End-semester University Examination (An open seminar followed by a Vivavoce)

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

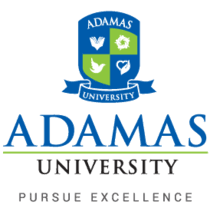
|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Investigate** a real world problem | **PO2,PO3,PSO1** |
| **CO2** | **Utilize** the modern tools to solve the problems | **PO2,PO3,PO4, PSO1** |
| **CO3** | **Discuss** in a group to promote team spirit and leadership quality among the students | **PO1, PO2, PO4, PO10, PSO2** |
| **CO4** | **Plan** a project involving both technological aspects and finance | **PO3,PO7, PO4, PO10, PSO1, PSO2** |
| **CO5** | **Identify** newer areas of in-depth study and research and lifelong learning | **PO7,PO12,PSO1, PSO2** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| CSE14431 | Project -II | 3 | 3 | 3 | 2 | - | - | 2 | - | - | 2 | - | 3 | 3 | 2 | - |

1=weakly mapped 2= moderately mapped 3=strongly mapped



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING & TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**CO – PO & PSO MAPPING**

**Name of the Programme: BCA**

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| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| MTH11221 | Mathematics- I | 3 | 3 | - | 2 | 2 | - | - | - | 3 | - | - | - | 2 | - | - |
| CSE11401 | Introduction to Programming | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | 3 | - | - |
| ENG11055 | English Communication | - | - | - | - | 3 | 3 | - | 2 | - | - | 3 | - | - | - | 2 |
| CSE11402 | Computer Fundamentals | 3 | 2 | - | 2 | - | - | - | - | - | - | - | 2 | 2 | - | - |
| EVS11103 | Environmental science | - | - | 3 | 3 | 3 | - | 3 | 2 | 3 | - | - | - | - | 2 | 3 |
| CSE12403 | Programming Lab | 3 | 3 | 2 | 3 | - | - | 2 | - | - | - | - | - | 3 | - | - |
| MTH11507 | Mathematics -II | 3 | 3 | - | - | - | - | - | - | 3 | - | - | 2 | - | 3 | - |
| CSE11404 | Programming & Data Structures | 2 | 3 | - | 3 | - | - | - | - | - | - | - | 2 | 3 | 2 | 3 |
| ECE11501 | Digital Electronics | 3 | 3 | - | 2 | 3 | - | - | - | - | - | - | 3 | - | 2 | 3 |
| CSE11405 | Design of Logic Circuit | - | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 3 | - | 3 |
| CSE11406 | Web Designing | - | 3 | 3 | - | 3 | 2 | - | - | - | 2 | - | 2 | 3 | 3 | - |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| CSE12407 | Data Structures Lab | 3 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 3 | 3 | 3 |
| ECE12502 | Digital Electronics Lab | 3 | 2 | 3 | - | - | 3 | - | - | - | 2 | - | - | 2 | 2 | 3 |
| CSE12408 | Web Designing Lab | 3 | 2 | 3 | 2 | - | - | 2 | - | - | - | - | 2 | 2 | 3 | 2 |
| CSE11409 | Object Oriented Programming with JAVA | 3 | 3 | - | 3 | - | - | - | - | - | - | - | - | 3 | 3 | 3 |
| CSE11410 | Programming in Python | 3 | 2 | 2 | 3 | - | - | - | - | - | - | - | - | 3 | - | - |
| CSE11411 | Computer Organization & Architecture | 3 | 2 | 3 | - | 2 | 3 | - | - | - | - | - | 3 | 3 | 2 | 3 |
| CSE11412 | Database Management System | 3 | 3 | 2 | 2 | - | - | 2 | - | - | - | - | 2 | 3 | 2 | 3 |
| CSE12413 | Object Oriented Programming Lab | 3 | 3 | 3 | - | 2 | - | - | - | - | - | - | 3 | 3 | 3 | 3 |
| CSE12414 | Python Programming Lab | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 3 | - | - |
| CSE12415 | Computer Organization Lab | 3 | - | 3 | - | 3 | - | - | - | - | - | - | 3 | 3 | 3 | - |
| CSE12416 | Database Management Systems Lab | 3 | 3 | 2 | 3 | - | - | 2 | - | - | - | - | 2 | 2 | 2 | 3 |
| ECE11503 | Data Communication and Computer Networks | 3 | 3 | 2 | 3 | 2 | - | 3 | - | - | - | - | - | 3 | - | - |
| CSE11417 | Algorithm Design | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | 3 | 3 | 3 | 3 |
| CSE11418 | Operating System | 3 | 3 | - | 3 | - | - | - | - | - | - | - | - | 3 | 3 | - |
| CSE11419 | Introduction to Computer Graphics | 3 | 3 | 2 | 3 | - | - | - | - | - | - | - | **-** | - | - | - |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| ECE12504 | Computer Network Lab | 3 | 3 | 3 | - | 2 | - | 3 | - | - | - | - | - | 3 | - | - |
| CSE12420 | Algorithm Design Lab | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | **-** | 3 | 3 | - |
| CSE12421 | Operating System Lab | 3 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | 3 | 2 | 3 | 3 |
| CSE12422 | Computer Graphics Lab | 3 | 3 | 2 | 2 | - | 2 | - | - | - | - | - | **-** | 3 | 2 | 3 |
| FAC11403 | Financial Accounting | - | - | - | 2 | - | - | - | - | - | - | 2 | - | - | 3 | 3 |
| IST11401 | Management Information System | 3 | 2 | 2 | 2 | - | - | - | - | - | - | 2 | 3 | - | - | - |
| CSE11423 | Artificial Intelligence | 3 | 2 | 2 | 2 | - | - | 2 | - | - | - | - | 2 | - | 2 | 3 |
| CSE11424 | Software Engineering | 3 | 2 | 2 | 2 | - | - | 2 | - | - | - | - | 2 | 3 | 3 | 2 |
| CSE11425 | Business Communication | - | 2 | - | - | - | 3 | - | - | - | 3 | - | 3 | - | - | - |
| CSE12426 | Artificial Intelligence Lab | 3 | 2 | 2 | 2 | - | - | 2 | - | - | - | - | 2 | - | 2 | 2 |
| CSE12427 | Software Engineering Lab | 3 | 2 | 2 | 2 | - | - | 2 | - | - | - | 2 | 2 | 1 | 3 | 2 |
| CSE14428 | Project -I | 3 | 3 | 3 | - | - | - | - | - | 2 | - | 2 | 2 | 3 | 2 | - |
| MKT12403 | E-commerce & Applications | 3 | 2 | 3 | 3 | - | - | - | 2 | - | - | - | - | 3 | 2 | - |
| CSE11429 | Cyber Security | 3 | - | 2 | - | 2 | 3 | - | 2 | - | - | - | - | - | - | - |
| CSE15430 | Comprehensive Viva | 3 | 3 | 3 | 2 | 3 | - | - | - | - | 2 | - | - | 3 | 3 | 2 |
| CSE14431 | Project -II | 3 | 3 | 3 | 2 | - | - | 2 | - | - | - | - | 3 | 3 | 2 | - |
| **Average of CO-PO Mapping** | | **2.92** | **2.59** | **2.53** | **2.39** | **2.53** | **2.71** | **2.27** | **2.00** | **2.75** | **2.25** | **2.20** | **2.43** | **2.81** | **2.52** | **2.73** |



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING**

**AND**

**TECHNOLOGY**

**DEPARTMANT OF COMPUTER SCIENCE AND**

**ENGINEERING**

**Course Structure & Syllabus**

**Of**

**Bachelor of Computer Application (BCA) Programme**

**With Specialization**

**In**

**Gaming and Animation**

**(W.e.f AY 2020 – 2021)**

**SoET 2.0 (Engineering+)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **UG PROGRAM: Bachelor of Computer Application (BCA) With Specialization in Gaming and Animation**  **SEMESTER IV** | | | | | | | | |
| **Sl. No** | **Type of**  **Course** | **Course**  **Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory | CSE11432 | Game Development -I | 3 | 0 | 0 | 3 | 3 |
| 2 | Practical | CSE12433 | Game Development –I (Using Unity 2D) | 0 | 0 | 3 | 3 | 2 |
| 3 | Practical | CSE12434 | Maya – Modeling, Rigging and Animation Lab  (Using Maya) | 0 | 0 | 3 | 3 | 2 |
| **Total** | | | | **3** | **0** | **6** | **9** | **7** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **UG PROGRAM: Bachelor of Computer Application (BCA) With Specialization in Gaming and Animation**  **SEMESTER V** | | | | | | | | |
| **Sl. No** | **Type of**  **Course** | **Course**  **Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory | CSE11435 | Drawing for Animation | 3 | 0 | 0 | 3 | 3 |
| 2 | Theory | CSE11436 | Game Development -II | 3 | 0 | 0 | 3 | 3 |
| 3 | Practical | CSE12437 | Game Development –II (Using Unity Advanced) | 0 | 0 | 3 | 3 | 2 |
| 4 | Practical | CSE12438 | 3D Character Animation Lab (Using Adobe Mixamo) | 0 | 0 | 3 | 3 | 2 |
| 5 | Practical | CSE12439 | Sound and Visual Effects Lab (Using Adobe Audition and Filmora) | 0 | 0 | 3 | 3 | 2 |
| 6 | Practical | CSE12440 | Multiplayer Game Programming Lab (Using Socket Programming and Unreal Engine) | 0 | 0 | 3 | 3 | 2 |
| **Total** | | | | **6** | **0** | **12** | **18** | **14** |

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| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **UG PROGRAM: Bachelor of Computer Application (BCA) With Specialization in Gaming and Animation SEMESTER VI** | | | | | | | | |
| **Sl. No** | **Type of**  **Course** | **Course**  **Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory | CSE11441 | Virtual and Augmented Reality | 3 | 0 | 0 | 3 | 3 |
| 2 | Practical | CSE12442 | Virtual and Augmented Reality Lab | 0 | 0 | 3 | 3 | 2 |
| **Total** | | | | **3** | **0** | **3** | **6** | **5** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CSE11432** | Game Development -I | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Computer Graphics** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To help the student to understand of the game development phase of process of game production.
2. To develop soft skills required for game developers.
3. To incorporate game idea creation.
4. To enable mechanics and gameplay elaboration.
5. To enable students to apply rapid prototyping, game balance and testing.

**Course Outcomes:**

On completion of this course, the students will be able to

**CO1. Define** the terms and principles of game development.

**CO2. Apply** the mathematics used in game development.

**CO3. Practice** animation production and creation tools.

**CO4. Select** and evaluate programming and scripting languages to develop particular games.

**CO5. Illustrate t**he development of critical thinking, quantitative reasoning, written, and oral communication.

**Catalog Description:**

Game development is a growing branch of Computer Science and Graphics. Games are being consumed all across the world, and India is quickly catching up. Mobile applications are widely in use everywhere, and are now indispensable in their ability to make modern phones smart.

The demand for game programmers is constantly growing, but the current education scenario does not serve to create the necessary talent pool. Through the BCA – Game &Animation Programme, Adamas University is trying to bring about the changes that the game and mobile application development industry now demands.

**Course Content:**

**Unit I: 12 lecture hours**

**Module 1:**

Understand foundations of game design and development: Explain Fundamentals of

Production, Understand Game Structure, Game Documentation, Industry Standard Game

Mechanics

Game Programming: Math, Collision Detection, And Physics: Mathematical Concept,

Collision Detection and Resolution, Real Time Game Physics

**Unit II: 6 lecture hours**

**Create assets for game development**: Understand Environments in Game Design, Develop a

Character, Create Game Art, Apply Animation to Game Assets

**Unit III: 8 lecture hours**

Audio Visual Design and Production: Visual Design, 2D modelling, 2D Texture and Texture

mapping, Special Effects, lighting, cinematography.

**Unit IV: 8 lecture hours**

**Build a game:** Explore 2D Game Engines, Diagram Game Levels, and Utilize Graphical User

Interface (GUI), Design Custom Mechanics, Integrate Media Types

**Unit V: 11 lecture hours**

**Game Testing:** Why Playtest? Being a Great Play tester Yourself, The Circles of Play testers,

Methods of Play testing, Other Important Types of Testing

**Understanding of legal and ethical issues in game design and development**: Apply Personal

and Professional Ethics

**Publishing the game**: Target Platforms, Marketing a Game

**Text Books:**

1. Game Design Workshop – Fourth Edition (by Tracy Fullerton)
2. Bond, J., 2020. Introduction To Game Design, Prototyping, And Development. [S.L.]: Addison – Wesley.
3. Rabin, S. Introduction To Game Development, Second Edition, Charles River Media, CENGAGE

Learning

**Reference Books:**

1. Game Development with Construct 2: From Design to Realization, Lee Stemkosi and Evan Leider,APress
2. Game Coding Complete – Fourth Edition by Mike McShaffry and David Graham

**Modes of Evaluation: Quiz/Assignment/Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | Define the terms and principles of game development. | **PO1, PO2, PO3, PSO3** |
| **CO2** | Apply the mathematics used in game development. | **PO1, PO2, PO3, PO4** |
| **CO3** | Practice animation production and creation tools. | **PO1, PO2, PO3, PO4, PO5** |
| **CO4** | Select and evaluate programming and scripting languages to develop particular games. | **PO1, PO4, PO5, PSO1, PSO4** |
| **CO5** | The development of critical thinking, quantitative reasoning, written, and oral communication. | **PO5, PSO1, PSO2, PSO4** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | **To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications of software applications in the usage of the modern era.** | **To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. Demonstrating the practice of professional ethics and the concerns for social welfare.** | Analyze and synthesis computing systems through quantitative and qualitative techniques. | This specialization offered to the students will enhance their knowledge in the field of 3D Animation. Students will become an expert in specific domain of 3D Animation and will work in Films, Games and other animationrelated fields. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE11432 | Game Development - I | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | 2 | 3 | 2 | 2 |

1=weakly mapped 2= moderately mapped 3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Gaming and Animation Semester: IV Stream: CSE

PAPER TITLE: Game Development -I

PAPER CODE:CSE11432

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **What** is scene? | **R** | **CO1** |
| 2. | **Define** character. | **R** | **CO2** |
| ­­­3. | **What** is full form of GUI? | **R** | **CO2** |
| 4. | **How** many layers of game design are there? | **R** | **CO4** |
| 5. | **What** is console? | **R** | **CO3** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **What** visual design? | **R** | **CO2** |
| 7. | **Describe** character and their behaviour in game development. | **U** | **CO2** |
| 8. | **How** many game genres there and exemplify them? | **R** | **CO3** |
| 9. | **Describe** game development levels. | **U** | **CO4** |
|  | **SECTION C(Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Describe** Game Engine. | **U** | **CO2** |
| 11. | **What** is game testing? Elaborate using example. | **R** | **CO1** |
| 12. | **Describe** the following: i) Players and ii) Conflict | **U** | **CO4** |

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| **CSE12433** | Game Development – I Lab (Using Unity 2D) | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **NA** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To help the student to understand of the game development phase of process of game production.
2. To develop soft skills required for game developers.
3. To incorporate game idea creation.
4. To enable mechanics and gameplay elaboration.
5. To enable students to apply rapid prototyping, game balance and testing.

**Course Outcomes:**

On completion of this course, the students will be able to

**CO1.** **Define** the terms and principles of game development.

**CO2.** **Apply** the mathematics used in game development.

**CO3.** **Practice** animation production and creation tools.

**CO4. Select** and evaluate programming and scripting languages to develop particular games.

**CO5. Illustrate** The development of critical thinking, quantitative reasoning, written, and oral communication.

**Catalog Description:**

Game development is a growing branch of Computer Science and Graphics. Games are being consumed all across the world, and India is quickly catching up. Mobile applications are widely in use everywhere, and are now indispensable in their ability to make modern phones smart.

The demand for game programmers is constantly growing, but the current education scenario does not serve to create the necessary talent pool. Through the BCA – Game & Animation Programme, Adamas University is trying to bring about the changes that the game and mobile application development industry now demands.

**Course Content:**

1. An Introduction to Unity Project Setup and creating some Game Objects,
2. Setting, organizing and structuring of first Unity Project and learning the process of importing a 3d Rig with Animations into the Game,
3. Moving an Object within the game environment and changing values dynamically using the previous learned concepts,
4. Create an Input and Script it in the Game,
5. Create Movement Controls with Physics,
6. Applying a Local Force, looping through collections, and creating, applying, or destroying any aspect of the game, procedurally,
7. Setting up, controlling, and interacting with audio clips through Unity's Editor and scripting,
8. Setting up attractive lighting, shadowing, and layered textures on a Material in order to impart realism to it as far as possible,
9. Animating characters by setting up inputs and setting up animation triggers based on the player inputs

**Text Books:**

1. Game Design Workshop – Fourth Edition (by Tracy Fullerton)
2. Bond, J., 2020. Introduction To Game Design, Prototyping, And Development. [S.L.]: Addison – Wesley.
3. Rabin, S. Introduction To Game Development, Second Edition, Charles River Media, CENGAGE

Learning

**Reference Books:**

1. Game Development with Construct 2: From Design to Realization, Lee Stemkosi and Evan Leider, APress
2. Game Coding Complete – Fourth Edition by Mike McShaffry and David Graham

**Modes of Evaluation: Quiz/Assignment/Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | Define the terms and principles of game development. | **PO1, PO2,PO3, PO4** |
| **CO2** | Apply the mathematics used in game development. | **PO1, PO3, PO5, PSO2** |
| **CO3** | Practice animation production and creation tools. | **PO2, PO3, PO4, PSO1, PSO2** |
| **CO4** | Select and evaluate programming and scripting languages to develop particular games. | **PO1, PO2, PO3, PO4, PSO1, PSO2 PSO4** |
| **CO5** | Illustrate the development of critical thinking, quantitative reasoning, written, and oral communication. | **PO1, PO2, PO5, PSO1, PSO2, PSO4** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | **To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications.of software applications in the usage of the modern era.** | **To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors.demonstrating the practice of professional ethics and the concerns for social welfare.** | Analyze and synthesis computing systems through quantitative and qualitative techniques. | This specialization offered to the students will enhance their knowledge in the field of 3D Animation. Students will become an expert in specific domain of 3D Animation and will work in Films, Games and other animation related fields. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE12433 | Game Development – I Lab (Using Unity 2D) | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | 2 | 3 | - | 2 |

1=weakly mapped 2= moderately mapped 3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Gaming and Animation Semester: IV Stream: CSE

PAPER TITLE: Game Development – I Lab (Using Unity 2D)

PAPER CODE: CSE12433

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 5 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 10 = 50)** | | | |
|  | **Create** Movement Controls with Physics | **U** | **CO2** |
|  | **Create** an Input and Script it in the TIC-TAC-TOE Game. | **U** | **CO3** |
|  | **Display** Shadowing. | **U** | **CO4** |
|  | **Develop** a game of 8-Puzzle problem. | **Ap** | **CO3** |
|  | **Display** Lighting. | **U** | **CO1** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CSE12434** | Maya – Modeling, Rigging and Animation Lab (Using Maya) | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Drawing for Animation** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To help the student to understand of the game development phase of process of game production.
2. To develop soft skills required for game developers.
3. To incorporate game idea creation.
4. To enable mechanics and gameplay elaboration.
5. To enable students to apply rapid prototyping, game balance and testing.

**Course Outcomes:**

On completion of this course, the students will be able to

**CO1.** **Define** the terms and principles of 3D Environment.

**CO2.** **Apply** various objects used in game design.

**CO3.** **Practice** animation production and creation tools.

**CO4.** **Select** and evaluate programming and scripting languages to develop particular games.

**CO5. Illustrate** the development of critical thinking, quantitative reasoning, written, and oral communication.

**Catalog Description:**

Game development is a growing branch of Computer Science and Graphics. Games are being consumed all across the world, and India is quickly catching up. Mobile applications are widely in use everywhere, and are now indispensable in their ability to make modern phones smart.

The demand for game programmers is constantly growing, but the current education scenario does not serve to create the necessary talent pool. Through the BCA – Game & Animation Programme, Adamas University is trying to bring about the changes that the game and mobile application development industry now demands.

**Course Content:**

Experiment 1. Create and edit node based-hierarchies within a 3D environment

Experiment 2. Identify pivot point locations of nodes, groups and other 3D objects

Experiment 3. Apply procedural deformers to geometry for animation

Experiment 4. Generate conceptual skeleton for 3D models

Experiment 5. Create and edit joint deformers to create a skeleton rig for 3D models

Experiment 6. Apply a skin to bind joints to geometry

Experiment 7. Modify the bind and skin weights with editing tools

Experiment 8. Create rigging controls for joint chain skeleton

Experiment 9. Test / troubleshoot custom character rigs

Experiment 10. Design custom character rigs for animations

**Modes of Evaluation: Quiz/Assignment/Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Define** the terms and principles of game design and development. | **PO1, PO2, PSO3, PSO2** |
| **CO2** | **Apply** the mathematics used in game design. | **PO1, PO2, PO3, PSO2** |
| **CO3** | **Practice** animation production and creation tools. | **PO1, PO2, PO3, PO5, PSO1, PSO2** |
| **CO4** | **Select** and evaluate programming and scripting languages to develop particular games. | **PO1, PO3, PO5, PSO1, PSO2, PSO3, PSO4** |
| **CO5** | **Illustrate** the development of critical thinking, quantitative reasoning, written, and oral communication. | **PO5, PSO1, PSO2, PSO3 PSO4** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | **To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications.of software applications in the usage of the modern era.** | **To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors.demonstrating the practice of professional ethics and the concerns for social welfare.** | Analyze and synthesis computing systems through quantitative and qualitative techniques. | This specialization offered to the students will enhance their knowledge in the field of 3D Animation. Students will become an expert in specific domain of 3D Animation and will work in Films, Games and other animation related fields. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE12434 | Maya – Modeling, Rigging and Animation Lab | 3 | 2 | 2 | - | 2 | - | - | - | - | - | - | - | 2 | 3 | 2 | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Gaming and Animation Semester: IV Stream: CSE

PAPER TITLE: Maya – Modeling, Rigging and Animation Lab

PAPER CODE: CSE12434

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 5 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 10 = 50)** | | | |
| 1. | **Identify** pivot point locations of nodes, groups and other 3D objects | **Ap** | **CO1** |
| 2. | **Apply** procedural deformers to geometry for animation | **Ap** | **CO2** |
| 3. | **Generate** conceptual skeleton for 3D models. | **Ap** | **CO1** |
| 4.. | **Create** rigging controls for joint chain skeleton. | **Ap** | **CO2** |
| 5. | **Design** custom character rigs for animations. | **U** | **CO3** |

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| **CSE11435** | Drawing for Animation | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Not Required** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To help the student to understand art of animation
2. To develop art skills required for game developers.
3. To incorporate artistic idea creation.
4. To enable mechanics and gameplay elaboration.
5. To enable students to apply rapid prototyping, game balance and testing.

**Course Outcomes:**

On completion of this course, the students will be able to

**CO1. Define** the terms and principles of drawing.

**CO2. Apply** the skills of drawing.

**CO3. Practice** fine arts.

**CO4. Select** and evaluate fine arts and animation

**CO5. Understand** critical thinking, quantitative reasoning, written, and oral communication.

**Catalog Description:**

Game development is a growing branch of Computer Science and Graphics. Games are being consumed all across the world, and India is quickly catching up. Mobile applications are widely in use everywhere, and are now indispensable in their ability to make modern phones smart.

The demand for game programmers is constantly growing, but the current education scenario does not serve to create the necessary talent pool. Through the BCA – Game &Animation Programme, Adamas University is trying to bring about the changes that the game and mobile application development industry now demands.

**Course Content:**

**Module 1: 9 Lecture Hours**

**Fundamentals of Drawing:** Free hand sketching of real-world objects (living and nonliving),

landscapes etc.

An introduction of how to make drawings for animation, shapes and forms, About 2D

and 3D drawings, Life drawing, Caricaturing-fundamentals, Exaggeration, Silhouette.

**Module 2: 9 Lecture Hours**

Background elements, trees, mountains, clouds, water bodies, meadows, buildings,

science fiction story backgrounds, backgrounds of mythological stories perspective

drawing Lights and shadows day night scenes.

**Module 3: 9 Lecture Hours**

Perspective drawing Lights and shadows day night scenes, Concept of layers, Back

ground, stage, foreground elements, Layout designs.

**Module 4: 9 Lecture Hours**

MALE AND FEMALE ANATOMY- Structure of male and female body, comparative

study of male and female body. Draw human body from 2d and 3d basic shapes. Body

parts:- Head, Torso, hands, legs, foot and palm. Face:- Different elements of face and

their distribution on face. Study of mouth, nose, eyes and ears.

**Module 5: 9 Lecture Hours**

Child, Animal and cartoon study- Understanding child’s figure, proportion and

construction of child body, face, chubbiness, hand, feet and gestures. Animals from basic

forms, understanding motion and grace of animals, turning animals to character, face,

legs, tails, perspectives. Understanding cartoon characters, drawing from basic shapes,

line of action, distortion of proportion, cartoon faces, eyes, mouths, hairs, nose, hands,

feet, gestures and poses.

**Modes of Evaluation: Quiz/Assignment/Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | Define the terms and principles of drawing. | **PO1, PO2, PSO3** |
| **CO2** | Apply the skills of drawing. | **PO1, PSO1, PSO4** |
| **CO3** | Practice fine arts. | **PO3, PO5, PSO1, PSO2** |
| **CO4** | Select and evaluate fine arts and animation | **PO1, PSO1, PSO2, PSO4** |
| **CO5** | The development of critical thinking, quantitative reasoning, written, and oral communication. | **PO5, PSO1, PSO2, PSO4** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | **To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications.of software applications in the usage of the modern era.** | **To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors.demonstrating the practice of professional ethics and the concerns for social welfare.** | Analyze and synthesis computing systems through quantitative and qualitative techniques. | This specialization offered to the students will enhance their knowledge in the field of 3D Animation. Students will become an expert in specific domain of 3D Animation and will work in Films, Games and other animation related fields. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE11435 | Drawing for Animation | 3 | 2 | 2 | - | 2 | - | - | - | - | - | - | - | 3 | 2 | 2 | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Gaming and Animation Semester: V Stream: CSE

PAPER TITLE: Drawing for Animation

PAPER CODE: CSE11435

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
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|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **What** is scene? | **R** | **CO1** |
| 2. | **What** is Silhouette? | **R** | **CO2** |
| ­­­3. | **What** is Caricaturing? | **R** | **CO2** |
| 4. | **What** is elements? | **R** | **CO4** |
| 5. | **What** is fine arts? | **R** | **CO3** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Differentiate** between fine arts and animatic art? | **U** | **CO2** |
| 7. | **Create** rigging controls for joint chain skeleton | **U** | **CO2** |
| 8. | **Differentiate** between light and shadow. | **U** | **CO3** |
| 9. | **Draw** a freehand sketch | **U** | **CO1** |
|  | **SECTION C(Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **What** is anatomy? State elaborately | **R** | **CO5** |
| 11. | **Describe** different elements of face | **U** | **CO5** |
| 12. | **Write** short notes on – i) Caricaturing-fundamentals ii) Exaggeration | **R** | **CO1** |

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| **CSE11436** | Game Development –II | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Game Development – I** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To help the student to understand of the advanced game development phase of process of game production.
2. To develop advanced skills required for game developers.
3. To incorporate game update.
4. To enable mechanics and gameplay elaboration.
5. To enable students to apply rapid prototyping, game balance and advanced testing.

**Course Outcomes:**

On completion of this course, the students will be able to

**CO1. Define** the terms and principles of advanced game development.

**CO2. Apply** the mathematics used in 3D game development.

**CO3. Practice** 3D modelling.

**CO4. Select** and evaluate programming and scripting languages to develop particular games.

**CO5. Illustrate t**he development of critical thinking, quantitative reasoning, written, and oral communication.

**Catalog Description:**

Game development - II is a growing branch of Computer Science and Graphics. Games are being consumed all across the world, and India is quickly catching up. Mobile applications are widely in use everywhere, and are now indispensable in their ability to make modern phones smart.

The demand for game programmers is constantly growing, but the current education scenario does not serve to create the necessary talent pool. Through the BCA – Game &Animation Programme, Adamas University is trying to bring about the changes that the game and mobile application development industry now demands.

**Course Content:**

**Unit I: 8 lecture hours**

**Module 1:**

Introduction to 3D Game Development: 3D Game Genres and Styles - Game

Platforms - Game Developer Roles, Elements of a 3D Game, The Torque Game Engine

**Unit II: 10 lecture hours**

**3D Programming Concepts:** 3D Concepts, Displaying 3D Models, 3D Programming,

Moving Right Along

**Game Programming, Game Play**

**Unit III: 8 lecture hours**

Introduction to Textures and Skin: Using Textures, UV Unwrapping, The Skin

Creation Process, Making a Vehicle Skin, Making a Player Skin

Creating GUI Elements: Controls, The Torque GUI Editor

**Unit IV: 10 lecture hours**

**Build a 3D Model:** Making a Character Model - Modelling Techniques, Making a

Vehicle Model – The Sketch, The Wheels, Making Weapon and Items - The Health Kit,

A Rock, Trees, Tommy Gun.

**Unit V: 9 lecture hours**

**Making the Game World Environment:** Various environmental situation making

**Creating and Programming Sound, Game Sound and Music**

**Text Books:**

1. Game Design Workshop – Fourth Edition (by Tracy Fullerton)
2. Bond, J., 2020. Introduction To Game Design, Prototyping, And Development. [S.L.]: Addison – Wesley.
3. Rabin, S. Introduction To Game Development, Second Edition, Charles River Media, CENGAGE
4. Learning

**Reference Books:**

1. Game Development with Construct 2: From Design to Realization, Lee Stemkosi and Evan Leider, APress
2. Game Coding Complete – Fourth Edition by Mike McShaffry and David Graham

**Modes of Evaluation: Quiz/Assignment/Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | Define the terms and principles of game design and development. | **PO1, PO2, PSO3** |
| **CO2** | Apply the mathematics used in game design. | **PO1, PO4, PO2, PO5, PSO1, PSO2, PSO3** |
| **CO3** | Practice animation production and creation tools. | **PO2, PO4, PO5, PSO1** |
| **CO4** | Select and evaluate programming and scripting languages to develop particular games. | **PO1, PSO1, PSO2, PSO3 PSO4** |
| **CO5** | The development of critical thinking, quantitative reasoning, written, and oral communication. | **PO5, PSO1, PSO2, PSO4** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | **To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications.of software applications in the usage of the modern era.** | **To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. Demonstrating the practice of professional ethics and the concerns for social welfare.** | Analyze and synthesis computing systems through quantitative and qualitative techniques. | This specialization offered to the students will enhance their knowledge in the field of 3D Animation. Students will become an expert in specific domain of 3D Animation and will work in Films, Games and other animation related fields. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE11436 | Game Development -II | 3 | 2 | - | 2 | 2 | - | - | - | - | - | - | - | 3 | 2 | 2 | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Gaming and Animation Semester: V Stream: CSE

PAPER TITLE: Game Development -II

PAPER CODE: CSE11436

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

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2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **What** is 3D plane? | **R** | **CO1** |
| 2. | **Define** model. | **R** | **CO1** |
| ­­­3. | **What** is full form of complex plane? | **R** | **CO2** |
| 4. | **How** many layers of development are there? | **R** | **CO5** |
| 5. | **What** is Texture? | **R** | **CO3** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **What** torque? | **R** | **CO1** |
| 7. | **Describe** game development levels. | **U** | **CO3** |
| 8. | **How** many game genres there and exemplify them? | **R** | **CO3** |
| 9. | **What** is game programming? | **R** | **CO2** |
|  | **SECTION C(Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Describe** Game Engine. | **U** | **CO2** |
| 11. | **What** is game testing? Elaborate using example. | **R** | **CO1** |
| 12. | **Describe** the following: i) Players and ii) Conflict | **U** | **CO3** |

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| **CSE12437** | Game Development – II Lab (Using Unity Advanced) | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Game Development – I lab** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To help the student to understand of the advanced game development phase of process of game production.
2. To develop advanced skills required for game developers.
3. To incorporate game update.
4. To enable mechanics and gameplay elaboration.
5. To enable students to apply rapid prototyping, game balance and advanced testing.

**Course Outcomes:**

On completion of this course, the students will be able to

**CO1.** **Define** the terms and principles of advanced game development.

**CO2.** **Apply** the mathematics used in 3D game development.

**CO3.** **Practice** 3D modelling.

**CO4.** **Select** and evaluate programming and scripting languages to develop particular games.

**CO5. Illustrate** the development of critical thinking, quantitative reasoning, written, and oral communication.

**Catalog Description:**

Game development - II is a growing branch of Computer Science and Graphics. Games are being consumed all across the world, and India is quickly catching up. Mobile applications are widely in use everywhere, and are now indispensable in their ability to make modern phones smart.

The demand for game programmers is constantly growing, but the current education scenario does not serve to create the necessary talent pool. Through the BCA – Game & Animation Programme, Adamas University is trying to bring about the changes that the game and mobile application development industry now demands.

**Course Content:**

**Experiment 1**

1. Programming Session in C# in Unity 3D,

**Experiment 2**

2. Unity 3D Game:

I. 3D Interface

II. Project Creation and Importing Game Assets into Unity 3D

III. Working with Lighting and Materials in Unity 3D

IV. Altering shaders in Unity 3D

V. Switching build platforms in Unity 3D

VI. Moving objects in Unity 3D

VII. Coroutines & wait times in Unity 3D

VIII. Inheritance & reusability in Unity 3D

IX. Importing & animating a character model in Unity 3D

X. Unity 3D rigid body & adding force with physics

XI. Working with audio in Unity 3D

XII. Detection collisions & using assertions in Unity 3D

XIII. Game state & singletons in Unity 3D

XIV. Creating a 2nd camera & how to make UI in Unity 3D

**Experiment 3**

3. Beginners and Advanced Lighting in Unity 3D

**Experiment 4**

4. Cinematic and Animations in Unity 3D

5. Compilation and Building a Standalone

**Modes of Evaluation: Quiz/Assignment/Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | Define the terms and principles of game design and development. | **PO1, PO2, PSO3** |
| **CO2** | Apply the mathematics used in game design. | **PO1, PO2, PO3, PSO1, PSO2** |
| **CO3** | Practice animation production and creation tools. | **PO1, PO3, PO4, PSO1, PSO2, PSO3** |
| **CO4** | Select and evaluate programming and scripting languages to develop particular games. | **PO1, PO2, PO3, PO4, PSO3** |
| **CO5** | Illustrate the development of critical thinking, quantitative reasoning, written, and oral communication. | **PO1, PO5, PSO1, PSO2, PSO4** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | **To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. Of software applications in the usage of the modern era.** | **To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. Demonstrating the practice of professional ethics and the concerns for social welfare.** | Analyze and synthesis computing systems through quantitative and qualitative techniques. | This specialization offered to the students will enhance their knowledge in the field of 3D Animation. Students will become an expert in specific domain of 3D Animation and will work in Films, Games and other animation related fields. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE12437 | Game Development – II Lab (Using Unity Advanced) | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 | 2 | 1 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Gaming and Animation Semester: V Stream: CSE

PAPER TITLE: Game Development – II Lab (Using Unity Advanced)

PAPER CODE: CSE12437

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 5 Total No of Pages: 01

**Instruction for the Candidate:**

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3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 10 = 50)** | | | |
|  | **Implement** Coroutine and wait times in 3D. | **Ap** | **CO1** |
|  | **Detect** collisions & using assertions in Unity 3D | **AP** | **CO5** |
|  | **Create** a 3D Interface | **AP** | **CO1** |
|  | **Create** an animation of kick of a football. | **Ap** | **CO2** |
|  | **Create** Moving objects in Unity 3D | **Ap** | **CO3** |

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| --- | --- | --- | --- | --- | --- |
| **CSE12438** | 3D Character Animation Lab (Using Adobe Mixamo) | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Basic knowledge of graphical systems** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To know about Animation basic blocking, Body Mechanics

2. To know about different advance Acting, Facial expression and Emotions.

3. To understand the 3d Animation according to storyboard.

4. To understand and use the Animation according to live action footage, Direction for animation.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1: **Learn** 3D animation tools and techniques.

CO2: **Understand** different tools, animation principles and facial expression.

CO3: **Analyze** the 3d animation like Body Mechanics, Acting, Facial expression and Emotions.

CO4: **Apply** tools and acquired knowledge to create 3d animation for films and video.

**Catalog Description:**

This course aims to deliver knowledge to students about 3D animation tool and techniques. They get to grasp knowledge about the different tools, animation principles and facial expressions. They analyze the different 3D animation like Body mechanics, acting, facial expression and emotions. This can be applied to create 3D animation for films and videos.

**Course Content:**

1. Introduction and review of animation principles

2. Intermediate Animation and Timing Techniques

3. To build a framework of skills and vocabulary to create 3D animation.

4. Facial Animation Techniques

5. To understand the fundamental components and their position in various 3D animation

workflows.

6. To apply theory and concept in 3D animation art-making.

7. To appreciate the interdisciplinary research attitudes of art and technology.

8. To invest independent and artistic expression along with problem solving processes during

construction.

9. To develop awareness of current 3D animation practices through diverse examples of animation,

films, videogames, art, etc.

**Text Books:**

**1**. A handbook of Perspective-Stephen M. Ship

2. Cartoons- Persten Blair

3. Human anatomy by-Victor Ferard

4. Figure drawing made easy by-Aditya Chari

**Reference Books:**

1. Design Drawing, Francis D K Ching, Wiley India

2. Drawing for Graphic Design, Timothy Samara, Rockport

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Learn** 3D animation tools and techniques. | **PO1,PO2,PO3** |
| **CO2** | **Understand** different tools, animation principles and facial expression | **PO1,PO2,PO3, PO5, PO6** |
| **CO3** | **Analyze** the 3d animation like Body Mechanics, Acting, Facial expression and Emotions. | **PO1,PO2,PO3,PO5, PSO4, PO6** |
| **CO4** | **Apply** tools and acquired knowledge to create 3d animation for films and video. | **PO1,PO2,PO3,PO5, PO6, PSO4** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. | This specialization offered to the students will enhance their knowledge and will be equipped with creative and technical skills in the field of 3D Animation, Gaming, VFX and multimedia. Students will become an expert in specific domain of 3D Animation and will work in Films, Games and other animation related fields. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE12438 | 3D Character Animation Lab (Using Adobe Mixamo) | 3 | 3 | 3 | - | 2 | 2 | - | - | - | - | - | **-** | - | - | - | 2 |

1=weakly mapped 2= moderately mapped 3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Gaming and Animation Semester: V Stream: CSE

PAPER TITLE: 3D Character Animation Lab (Using Adobe Mixamo) PAPER CODE:CSE12438

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 5 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 10 = 50)** | | | |
| 1. | To **apply** theory and concept in 3D animation art-making. | **Ap** | **CO2** |
| 2. | **Develop** Intermediate Animation and Timing Techniques | **Ap** | **CO3** |
| ­­­ 3. | **Build** a framework of skills and vocabulary to create 3D animation. | **Ap** | **CO4** |
| 4. | **Apply** Facial Animation Techniques | **AP** | **CO5** |
| 5. | **Understand** the fundamental components and their position in various 3D animation workflows. | **U** | **CO1** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CSE12439** | Sound and Visual Effects Lab (Using Adobe Audition and Filmora) | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Basic knowledge of computer animation** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To know about basic digital audio and video.

2. To understand the editing of audio in editing software.

3. To know how to shoot a video for production.

4. To learn video editing software and different types of outputs for broadcasting.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1: **Describe** fundamental of audio and video.

CO2: **Understand** different styles and treatment of content in audio and video production

and editing

CO3: **Analyze** the films and videos and importance of codec and format for final output

to broadcasting.

CO4: **Apply** the acquired knowledge of audio and video editing for films and videos.

**Catalog Description:**

This course aims to deliver knowledge to students about audio editing and video production. They get to grasp knowledge about the different styles and treatment of content in audio and video production and editing. They get to analyze the films and videos and importance of codec and format for final output to broadcasting.

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**Course Content:**

**Adobe Audition:**

1. Recording your Voice in the Studio

2. Importing Music into a Project

3. Editing Audio in Edit View

4. Editing Audio in Multi-track View

5. Exporting and Finishing an Audio Project

6. Using CD Project View to Burn an Audio CD

7. Adding Music from a regular CD

**Filmora:**

1. Exploring Filmora interface

2. Import and organize media files

3. Exporting and sharing the video

4. Editing faster with shared media library

5. Creative ways of making split screen videos

6. Editing videos with auto ripple and creative blend mode

**Text Books:**

**1**. A handbook of Perspective-Stephen M. Ship

2. Cartoons- Persten Blair

3. Human anatomy by-Victor Ferard

4. Figure drawing made easy by-Aditya Chari

**Reference Books:**

1. Design Drawing, Francis D K Ching, Wiley India

2. Drawing for Graphic Design, Timothy Samara, Rockport

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Describe** fundamental of audio and video. | **PO1,PO2,PO3** |
| **CO2** | **Understand** different styles and treatment of content in audio and video production and editing | **PO1,PO2,PO3** |
| **CO3** | **Analyze** the films and videos and importance of codec and format for final output to broadcasting | **PO1,PO2,PO3,PO5,PO10 PSO4** |
| **CO4** | **Apply** the acquired knowledge of audio and video editing for films and videos. | **PO1,PO2,PO3,PO6,PO10, PSO4** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. | This specialization offered to the students will enhance their knowledge and will be equipped with creative and technical skills in the field of 3D Animation, Gaming, VFX and multimedia. Students will become an expert in specific domain of 3D Animation and will work in Films, Games and other animationrelated fields. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE12439 | Sound and Visual Effects Lab (Using Adobe Audition and Filmora) | 3 | 3 | 3 | - | 2 | 2 | - | - | - | 2 | - | **-** | - | - | - | 2 |

1=weakly mapped 2= moderately mapped 3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Gaming and Animation Semester: V Stream: CSE

PAPER TITLE: Sound and Visual Effects Lab (Using Adobe Audition and Filmora) PAPER CODE: CSE12439

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 5 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 10 = 50)** | | | |
| 1. | **Find** the process of recording your Voice in the Studio (Adobe Audition) | **U** | **CO1** |
| 2. | **Find** the process of Importing Music into a Project (Adobe Audition) | **U** | **CO2** |
| ­­­ 3. | **Find** the process of Editing Audio in Edit View (Adobe Audition) | **U** | **CO2** |
| 4. | **Find** the process of Import and organize media files (Filmora) | **U** | **CO3** |
| 5. | **Find** the process of Exporting and sharing the video (Filmora) | **U** | **CO4** |

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| **CSE12440** | Multiplayer Game Programming Lab (Using Socket Programming and Unreal Engine) | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Basic knowledge of online computer gaming technicality** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To know about Socket programming.

2. To know about creating own Network library

3. To know about the technicalities about creation of online games.

4. To learn optimizing, testing and deploying a Unreal Engine project.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1: **Describe** fundamental of Socket programming.

CO2: **Understand** the procedure for creating own Network library.

CO3: **Analyze** the technicalities about creation of online games.

CO4: **Apply** the acquired knowledge of optimizing, testing and deploying a Unreal Engine project.

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**Catalog Description:**

This course aims to deliver knowledge to students about Computer network programming and Unreal Engine. They get to grasp knowledge about the procedure for creating own Network library. They become familiar with analyzing the technicalities about creation of online games and also apply the acquired knowledge of optimizing, testing and deploying a Unreal Engine project.

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**Course Content:**

**Laboratory:**

Computer Network Programming:

This part of this laboratory course is to be performed through

1. Socket Programming

2. Visual Studio (for UI and graphic related design)

3. Creating Own Network Library using dream Sock Socket

4. Creating a basic network application using dream Sock

5. Creating Game Lobby using Lobby System Code, Lobby Server Code, Lobby Client Code

6. Creating an online game.

**Unreal Engine:**

1. Learning how to use project templates for the development of games
2. Create custom Blueprints and C++ classes and extend from Epic's base classes
3. Using Unreal Motion Graphics (UMG) to create menus and Heads-up Displays (HUDs) for the development of game
4. Develop more dynamic characters using Animation Blueprints
5. Understand how to create complex AI with behavior trees
6. Formatting game data for efficient Internet transmission
7. Synchronizing states so all players share the same world
8. Scaling games without compromising performance
9. Optimize, test, and deploy a UE4 project

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Describe** fundamental of Socket programming | **PO1,PO2,PO3, PO6** |
| **CO2** | **Understand** the procedure for creating own Network library. | **PO1,PO2,PO3, PO5, PSO4** |
| **CO3** | **Analyze** the technicalities about creation of online games | **PO1,PO2,PO3,PO5, PO6, PO10, PSO4** |
| **CO4** | **Apply** the acquired knowledge of optimizing, testing and deploying a Unreal Engine project. | **PO1,PO2,PO3, PO5, PO6,PO10, PSO4** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. | This specialization offered to the students will enhance their knowledge and will be equipped with creative and technical skills in the field of 3D Animation, Gaming, VFX and multimedia. Students will become an expert in specific domain of 3D Animation and will work in Films, Games and other animation related fields. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE12440 | Multiplayer Game Programming Lab(Using Socket Programming and Unreal Engine) | 3 | 3 | 3 | - | 2 | 2 | - | - | - | 2 | - | **-** | - | - | - | 2 |

1=weakly mapped 2= moderately mapped 3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Gaming and Animation Semester: V Stream: CSE

PAPER TITLE: Multiplayer Game Programming Lab (Using Socket Programming and Unreal Engine) PAPER CODE: CSE12440

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 5 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 10 = 50)** | | | |
| 1. | **Create** Own Network Library using dream Sock Socket | **AP** | **CO1** |
| 2. | **Create** a basic network application using dream Sock | **AP** | **CO2** |
| ­­­ 3. | **Create** Game Lobby using Lobby System Code, Lobby Server Code, Lobby Client Code | **AP** | **CO2** |
| 4. | **Create** custom Blueprints and C++ classes and extend from Epic's base classes | **AP** | **CO3** |
| 5. | **Use** Unreal Motion Graphics (UMG) to create menus and Heads-up Displays (HUDs) for the development of game | **AP** | **CO4** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CSE11441** | Virtual and Augmented Reality | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basic knowledge of image and graphics** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To know about modelling the physical world.

2. To know about Camera tracking and 3D rendering for Immersive Environments.

3. To understand the present and the future of xR

4. To understand and use Immersive Technologies

**Course Outcomes:**

On completion of this course, the students will be able to

CO1: **Understand** the Presence, Agency and Interactivity

CO2: **Understand** the Modeling the Physical world

CO3: **Describe** Camera tracking and 3D Rendering for Immersive Environments

CO4: **Describe** the present and the future of xR

CO5: **Understand** The Human behind the lenses

CO6: **Understand** Introduction to Immersive Technologies

**Catalog Description:**

This course aims to deliver knowledge to students about the introduction to immersive technologies. It enables the students to grasp knowledge about the present and the future of xR. The knowledge about the 3D rendering and camera tracking for immersive environments is delivered to the students. They get to grasp knowledge about the present and the future of XR.

**Course Content:**

**UNIT – I 4 lecture hours**

VIRTUAL REALITY AND VIRTUAL ENVIRONMENTS:

The historical development of VR: Scientific landmarks Computer Graphics, Real-time

computer graphics, Flight simulation, Virtual environments, Requirements for VR,

benefits of Virtual reality.

**UNIT – II 6 lecture hours**

HARDWARE TECHNOLOGIES FOR 3D USER INTERFACES

Visual Displays Auditory Displays, Haptic Displays, Choosing Output Devices for 3D

User Interfaces.

**UNIT – III 5 lecture hours**

(3D USER INTERFACE INPUT HARDWARE:

Input device characteristics, Desktop input devices, Tracking Devices, 3D Mice, Special

Purpose Input Devices, Direct Human Input, Home - Brewed Input Devices, Choosing

Input Devices for 3D Interfaces

**UNIT – IV 10 lecture hours**

SOFTWARE TECHNOLOGIES:

Database - World Space, World Coordinate, World Environment, Objects - Geometry,

Position / Orientation, Hierarchy, Bounding Volume, Scripts and other attributes, VR

Environment - VR Database, Tessellated Data, LODs, Cullers and Occluders, Lights and

Cameras, Scripts, Interaction - Simple, Feedback, Graphical User Interface, Control

Panel, 2D Controls, Hardware Controls, Room / Stage / Area Descriptions, World

Authoring and Playback, VR toolkits, Available software in the market

**UNIT – V 12 lecture hours**

3D INTERACTION TECHNIQUES:

3D Manipulation tasks, Manipulation Techniques and Input Devices, Interaction

Techniques for 3D Manipulation, Deign Guidelines - 3D Travel Tasks, Travel

Techniques, Design Guidelines - Theoretical Foundations of Wayfinding, User Centered

Wayfinding Support, Environment Centered Wayfinding Support, Evaluating

Wayfinding Aids, Design Guidelines - System Control, Classification, Graphical Menus,

Voice Commands, Gestrual Commands, Tools, Mutimodal System Control Techniques,

Design Guidelines, Case Study: Mixing System Control Methods, Symbolic Input Tasks,

symbolic Input Techniques, Design Guidelines, Beyond Text and Number entry

DESIGNING AND DEVELOPING 3D USER INTERFACES: Strategies for

Designing and Developing Guidelines and Evaluation.

**UNIT – VI 8 lecture hours**

ADVANCES IN 3D USER INTERFACES: 3D User Interfaces for the

Real World, AR Interfaces as 3D Data Browsers, 3D Augmented Reality Interfaces,

Augmented Surfaces and Tangible Interfaces, Agents in AR, Transitional AR-VR

Interfaces - The future of 3D User Interfaces, Questions of 3D UI Technology, 3D

Interaction Techniques, 3D UI Design and Development, 3D UI Evaluation and Other

Issues.

VIRTUAL REALITY APPLICATIONS: Engineering, Architecture, Education,

Medicine, Entertainment, Science, Training.

**Text Books:**

1. Alan B Craig, William R Sherman and Jeffrey D Will, “Developing Virtual Reality

Applications: Foundations of Effective Design”, Morgan Kaufmann, 2009.

2. Doug A Bowman, Ernest Kuijff, Joseph J LaViola, Jr and Ivan Poupyrev, “3D User

Interfaces, Theory and Practice”, Addison Wesley, USA, 2005.

**Reference Books:**

1. John Vince, “Virtual Reality Systems”, Addison Wesley, 1995.

2. Burdea, Grigore C and Philippe Coiffet, “Virtual Reality Technology”, Wiley Inter – Science, India,

2003.

3. William R Sherman and Alan B Craig, “Understanding Virtual Reality: Interface, Application and

Design (The Morgan Kaufmann Series in Computer Graphics)”. Morgan Kaufmann Publishers, San

Francisco, CA, 2002.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understand** the Presence, Agency and Interactivity | **PO1,PO2,PO3** |
| **CO2** | **Understand** the Modelling the Physical world | **PO1,PO2,PO3, PO5** |
| **CO3** | **Describe** Camera tracking and 3D Rendering for Immersive Environments | **PO1,PO2,PO3,PO5, PO6** |
| **CO4** | **Describe** The present and the future of xR | **PO1,PO2,PO3,PO6** |
| **CO5** | **Understand** The Human behind the lenses | **PO1,PO2,PO3,PO6, PSO4** |
| **CO6** | **Understand** Introduction to Immersive Technologies | **PO1,PO2,PO3,PO10,PO5, PSO4** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. | This specialization offered to the students will enhance their knowledge and will be equipped with creative and technical skills in the field of 3D Animation, Gaming, VFX and multimedia. Students will become an expert in specific domain of 3D Animation and will work in Films, Games and other animationrelated fields. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE11441 | Virtual and Augmented Reality | 3 | 3 | 3 | - | 2 | 2 | - | - | - | 2 | - | **-** | - | - | - | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Gaming and Animation Semester: VI Stream: CSE

PAPER TITLE: Virtual and Augmented Reality PAPER CODE: CSE11441

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **What** is Depth Sensing? | **U** | **CO1** |
| 2. | **What** is augmented reality? | **U** | **CO5** |
| ­­­ 3. | **What is** a 3D interaction technique? | **R** | **CO2** |
| 4. | **Mention** one input device for 3D interface. | **R** | **CO4** |
| 5. | **What is** world co-ordinate? | **R** | **CO3** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Discuss** role of Virtual Reality in the digital world. | **U** | **CO1** |
| 7. | **What** are the different motion tracking tools available? Explain. | **U** | **CO2** |
| 8. | **What** are the effects of VR simulation on users? | **U** | **CO5** |
| 9. | **Explain** the VR Health and safety issues. | **U** | **CO3** |
|  | **SECTION (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Write** short notes on Navigation and Controller in VR. | **U** | **CO4** |
| 11. | **Explain** how the VR impacts professional, public and private life with the help of example. | **U** | **CO4** |
| 12. | **Elucidate** areas and industries for immersive reality applications | **An** | **CO6** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CSE12442** | Virtual and Augmented Reality Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Basic knowledge of image and graphics** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To know about modelling the physical world.

2. To know about Camera tracking and 3D Rendering for Immersive Environments.

3. To understand the present and the future of xR

4. To understand and use Immersive Technologies

**Course Outcomes:**

On completion of this course, the students will be able to

CO1: **Understand** the Presence, Agency and Interactivity

CO2: **Understand** the : Modeling the Physical world

CO3: **Apply** Camera tracking and 3D Rendering for Immersive Environments

CO4: **Apply** the Mobile app technologies

CO5: **Understand** Realistic surface texturing

CO6: **Understand** semi-immersive simulation in real time environment

**Catalog Description:**

This course aims to deliver knowledge to students about the introduction to immersive technologies. It enables the students to grasp knowledge about the present and the future of xR. The knowledge about the 3D rendering and camera tracking for immersive environments is delivered to the students. They get to grasp knowledge about the present and the future of XR.

**Course Content:**

**Laboratory:**

1. Introduction

2. Mixed Reality Environments

a. Virtual Reality (VR)

i. 3D visualization

ii. Non-immersive - Computer desktop

iii. Semi-immersive - Flight simulator (large screen)

iv. Fully immersive - 3D headsets or caves (rooms)

b. Augmented Reality (AR)

i. 3D visualization

ii. Layers combine different types of media: Live video feed: e.g from

camera/webcam or picture from camera

iii. Computer generated information such as text-boxs/pop-ups.

iv. Location services: real-time location information from GPS

v. Real-time integration with realism.

vi. Visualizing & interacting with virtual objects in real environment

vii. Tracking of objects usually via camera or webcam.

viii. Multi-media augmentations: visual, audio, tactile and haptic.

3. Mobile AR (mAR)

a. App overview

4. Experiments in mAR

a. Overlay computer generated virtual objects on real live video feeds

b. Faithfully reproduce presence of virtual object in real time interactive 3D

c. Semi-immersive simulation in real environment.

d. Ability to use normal (arbitrary) objects as location markers

e. Realistic surface texturing

f. Automatic zooming in 3D from any angle

**Text Books:**

1. Alan B Craig, William R Sherman and Jeffrey D Will, “Developing Virtual Reality

Applications: Foundations of Effective Design”, Morgan Kaufmann, 2009.

2. Doug A Bowman, Ernest Kuijff, Joseph J LaViola, Jr and Ivan Poupyrev, “3D User

Interfaces, Theory and Practice”, Addison Wesley, USA, 2005.

**Reference Books:**

1. John Vince, “Virtual Reality Systems”, Addison Wesley, 1995.

2. Burdea, Grigore C and Philippe Coiffet, “Virtual Reality Technology”, Wiley Inter – Science, India,

2003.

3. William R Sherman and Alan B Craig, “Understanding Virtual Reality: Interface, Application and

Design (The Morgan Kaufmann Series in Computer Graphics)”. Morgan Kaufmann Publishers, San

Francisco, CA, 2002.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understand** the Presence, Agency and Interactivity | **PO1,PO2,PO3** |
| **CO2** | **Understand** the Modelling the Physical world | **PO1,PO2,PO3, PO10** |
| **CO3** | **Apply** Camera tracking and 3D Rendering for Immersive Environments | **PO1,PO2,PO3,PO5, PO10** |
| **CO4** | **Apply** the Mobile app technologies | **PO1,PO2,PO3,PO6, PO10** |
| **CO5** | **Understand** Realistic surface texturing | **PO1,PO2,PO3,PO6,PSO4** |
| **CO6** | **Understand** semi-immersive simulation in real time environment | **PO1,PO2,PO3,PO10,PO5,PSO4** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. | This specialization offered to the students will enhance their knowledge and will be equipped with creative and technical skills in the field of 3D Animation, Gaming, VFX and multimedia. Students will become an expert in specific domain of 3D Animation and will work in Films, Games and other animationrelated fields. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE12442 | Virtual and Augmented Reality Lab | 3 | 3 | 3 | - | 2 | 2 | - | - | - | 2 | - | **-** | - | - | - | 2 |

1=weakly mapped 2= moderately mapped 3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Gaming and Animation Semester: VI Stream: CSE

PAPER TITLE: Virtual and Augmented Reality Lab PAPER CODE: CSE12442

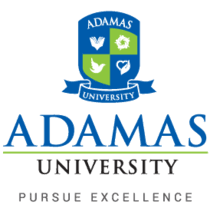
Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 5 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 10 = 50)** | | | |
| 1. | **Perform** 3D visualization | **U** | **CO1** |
| 2. | **Perform** Real-time integration with realism. | **AP** | **CO2** |
| ­­­ 3. | Multi-media augmentations: visual, audio, tactile and haptic. | **U** | **CO3** |
| 4. | **Perform** Semi-immersive simulation in real environment. | **AP** | **CO4** |
| 5. | **Understand** the ability to use normal (arbitrary) objects as location markers | **U** | **CO5** |



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING & TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**CO – PO & PSO MAPPING**

**Name of the Programme: BCA**

**Specialization: Gaming and Animation**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | | **PO12** | **PSO1** | | **PSO2** | **PSO3** | **PSO4** |
| MTH11221 | Mathematics- I | 3 | 3 | - | 2 | 2 | - | - | - | 3 | - | - | | - | 2 | | - | - | NA |
| CSE11401 | Introduction to Programming | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | | - | 3 | | - | - | NA |
| ENG11055 | ENGLISH COMMUNICATION | - | - | - | - | 3 | 3 | - | 2 | - | - | 3 | | - | - | | - | 2 | NA |
| CSE11402 | Computer Fundamentals | 3 | 2 | - | 2 | - | - | - | - | - | - | - | | 2 | 2 | | - | - | NA |
| EVS11103 | Environmental science | - | - | 3 | 3 | 3 | - | 3 | 2 | 3 | - | - | | - | - | | 2 | 3 | NA |
| CSE12403 | Programming Lab | 3 | 3 | 2 | 3 | - | - | 2 | - | - | - | - | | - | 3 | | - | - | NA |
| MTH11507 | Mathematics- II | 3 | 3 | - | - | - | - | - | - | 3 | - | - | | 2 | - | | 3 | - | NA |
| CSE11404 | Programming & Data Structures | 2 | 3 | - | 3 | - | - | - | - | - | - | - | | 2 | 3 | | 2 | 3 | NA |
| ECE11501 | Digital Electronics | 3 | 3 | - | 2 | 3 | - | - | - | - | - | - | | 3 | - | | 2 | 3 | NA |
| CSE11405 | Design of Logic Circuit | - | 3 | 3 | 3 | - | - | - | - | - | - | - | | - | 3 | | - | 3 | NA |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | | **PO12** | **PSO1** | | **PSO2** | **PSO3** | **PSO4** |
| CSE11406 | Web Designing | - | 3 | 3 | - | 3 | 2 | - | - | - | 2 | - | | 2 | 3 | | 3 | - | NA |
| CSE12407 | Data Structures Lab | 3 | 3 | 2 | 3 | - | - | - | - | - | - | - | | - | 3 | | 3 | 3 | NA |
| ECE12502 | Digital Electronics Lab | 3 | 2 | 3 | - | - | 3 | - | - | - | 2 | - | | - | 2 | | 2 | 3 | NA |
| CSE12408 | Web Designing Lab | 3 | 2 | 3 | 2 | - | - | 2 | - | - | - | - | | 2 | 2 | | 3 | 2 | NA |
| CSE11409 | Object Oriented Programming with JAVA | 3 | 3 | - | 3 | - | - | - | - | - | - | - | | - | 3 | | 3 | 3 | NA |
| CSE11410 | Programming in Python | 3 | 2 | 2 | 3 | - | - | - | - | - | - | - | | - | 3 | | - | - | NA |
| CSE11411 | Computer Organization & Architecture | 3 | **2** | **3** | **-** | **2** | **3** | **-** | **-** | **-** | **-** | **-** | | **3** | 3 | | 2 | 3 | NA |
| CSE11412 | Database Management System | 3 | 3 | 2 | 2 | - | - | 2 | - | - | - | - | | 2 | 3 | | 2 | 3 | NA |
| CSE12413 | Object Oriented Programming Lab | 3 | 3 | 3 | - | 2 | - | - | - | - | - | - | | 3 | 3 | | 3 | 3 | NA |
| CSE12414 | Python Programming Lab | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | | - | 3 | | - | - | NA |
| CSE12415 | Computer Organization Lab | 3 | **-** | 3 | **-** | 3 | **-** | **-** | **-** | **-** | **-** | **-** | | 3 | 3 | | 3 | - | NA |
| CSE12416 | Database Management Systems Lab | 3 | 3 | 2 | 3 | - | - | 2 | - | - | - | - | | 2 | 2 | | 2 | 3 | NA |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | | **PO12** | **PSO1** | | **PSO2** | **PSO3** | **PSO4** |
| ECE11503 | Data Communication and Computer Networks | 3 | 3 | 2 | 3 | 2 | - | 3 | - | - | - | - | | - | 3 | | - | - | NA |
| CSE11417 | Algorithm Design | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | | 3 | 3 | | 3 | 3 | NA |
| CSE11418 | Operating System | 3 | 3 | - | 3 | - | - | - | - | - | - | - | | - | 3 | | 3 | - | NA |
| CSE11419 | Introduction to Computer Graphics | 3 | 3 | 2 | 3 | - | - | - | - | - | - | - | | **-** | 3 | | 3 | 3 | NA |
| CSE11432 | Game Development - I | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | | - | 2 | | 3 | 2 | 2 |  | |
| ECE12504 | Computer Network Lab | 3 | 3 | 2 | 3 | 2 | - | 3 | - | - | - | - | | - | 3 | | - | - | NA |
| CSE12420 | Algorithm Design Lab | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | | **-** | 3 | | 3 | - | NA |
| CSE12421 | Operating System Lab | 3 | 2 | 3 | 2 | 2 | - | - | - | - | - | - | | 3 | 2 | | 3 | 3 | NA |
| CSE12422 | Computer Graphics Lab | 3 | 3 | 2 | 3 | - | 2 | - | - | - | - | - | | **-** | 3 | | 3 | 3 | NA |
| CSE12433 | Game Development – I Lab(Using Unity 2D) | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | | - | 2 | | 3 | - | 2 |  | | | | | |
| CSE12434 | Maya – Modeling, Rigging and Animation Lab | 3 | 2 | 2 | - | 2 | - | - | - | - | - | - | | - | 2 | | 3 | 2 | 2 |  | | |
| CSE11423 | Artificial Intelligence | 3 | 2 | 2 | 2 | - | - | 2 | - | - | - | - | | 2 | - | | 2 | 3 | NA |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | | **PO12** | **PSO1** | | **PSO2** | **PSO3** | **PSO4** |
| CSE11424 | Software Engineering | 3 | 2 | 2 | 2 | - | - | 2 | - | - | - | - | | 2 | 3 | | 3 | 2 | NA |
| CSE11435 | Drawing for Animation | 3 | 2 | 2 | - | 2 | - | - | - | - | - | - | | - | 3 | | 2 | 2 | 2 |  | | | | | | |
| CSE11436 | Game Development - II | 3 | 2 | - | 2 | 2 | - | - | - | - | - | - | | - | 3 | | 2 | 2 | 2 |  | | | | |
| CSE12426 | Artificial Intelligence Lab | 3 | 2 | 2 | 2 | - | - | 2 | - | - | - | - | | 2 | - | | 2 | 2 | NA |
| CSE12427 | Software Engineering Lab | 3 | 2 | 2 | 2 | - | - | - | - | - | - | 2 | | 2 | 2 | | 3 | 2 | NA |
| CSE12437 | Game Development – II Lab(Using Unity Advanced) | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | | - | 2 | | 2 | 2 | 2 |  | | | | |
| CSE12438 | 3D Character Animation Lab (Using Adobe Mixamo) | 3 | 3 | 3 | - | 2 | 2 | - | - | - | - | - | | **-** | - | | - | - | 2 |  | | | | | | | |
| CSE12439 | Sound and Visual Effects Lab (Using Adobe Audition and Filmora) | 3 | 3 | 3 | - | 2 | 2 | - | - | - | 2 | - | | **-** | - | | - | - | 2 |  | | | |
| CSE12440 | Multiplayer Game Programming Lab(Using Socket Programming and Unreal Engine) | 3 | 3 | 3 | - | 2 | 2 | - | - | - | 2 | - | | **-** | - | | - | - | 2 |  |
| CSE14428 | Project -I | 3 | 3 | 3 | - | - | - | - | - | 2 | - | 2 | | 2 | 3 | | 2 | - | NA |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | | **PO12** | **PSO1** | | **PSO2** | **PSO3** | **PSO4** |
| CSE11441 | Virtual and Augmented Reality | 3 | 3 | 3 | - | 2 | 2 | - | - | - | 2 | - | | **-** | - | | - | - | 2 |  | | |
| CSE11429 | Cyber Security | 3 | - | 2 | - | 2 | 3 | - | - | - | - | - | | -  - | - | | - | - | NA |
| CSE12442 | Virtual and Augmented Reality Lab | 3 | 3 | 3 | - | 2 | 2 | - | - | - | 2 | - | | **-** | - | | - | - | 2 |  |
| CSE15430 | Viva-voce | 3 | 3 | 3 | 2 | 3 | - | - | - | - | 2 | - | | - | 3 | | 3 | 2 | NA |
| CSE14431 | Project -II | 3 | 3 | 3 | 2 | - | - | 2 | - | - | 2 | - | | 3 | 3 | | 2 | - | NA |
| **Average of CO-PO Mapping** | | **2.93** | **2.60** | **2.50** | **2.39** | **2.31** | **2.36** | **2.27** | **2.0** | **2.75** | **2.00** | **2.33** | **2.34** | | | **2.70** | **2.58** | **2.59** | **2.00** |



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING**

**AND**

**TECHNOLOGY**

**DEPARTMANT OF COMPUTER SCIENCE AND**

**ENGINEERING**

**Course Structure & Syllabus**

**Of**

**Bachelor of Computer Application (BCA) Programme**

**With Specialization**

**In**

**Banking, Financial Services and Insurance**

**(W.e.f AY 2020 – 2021)**

**SoET 2.0 (Engineering+)**

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| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **UG PROGRAM: Bachelor of Computer Application (BCA)**  **With Specialization in Banking, Financial Services and Insurance**  **SEMESTER IV** | | | | | | | | |
| **Sl. No** | **Type of Course** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory | CSE11443 | Introduction to Banking Management | 3 | 0 | 0 | 3 | 3 |
| 2 | Theory | CSE11444 | Banking and Economy | 3 | 0 | 0 | 3 | 3 |
| 3 | Theory | CSE11445 | Customer Relationship Management in Banking | 3 | 0 | 0 | 3 | 3 |
| **Total** | | | | **9** | **0** | **0** | **9** | **9** |

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| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **UG PROGRAM: Bachelor of Computer Application (BCA)**  **With Specialization in Banking, Financial Services and Insurance**  **SEMESTER V** | | | | | | | | |
| **Sl. No** | **Type of Course** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory | CSE11446 | Financial Management | 3 | 0 | 0 | 3 | 3 |
| 2 | Theory | CSE11447 | Universal Banking | 3 | 0 | 0 | 3 | 3 |
| 3 | Practical | CSE12448 | FLEXCUBE Universal Banking-I Lab | 0 | 0 | 3 | 3 | 2 |
| **Total** | | | | **6** | **0** | **3** | **9** | **8** |

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| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **UG PROGRAM: Bachelor of Computer Application (BCA)**  **With Specialization in Banking, Financial Services and Insurance**  **SEMESTER VI** | | | | | | | | |
| **Sl. No** | **Type of Course** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory | CSE11449 | Risk Management | 3 | 0 | 0 | 3 | 3 |
| 2 | Theory | CSE11450 | Insurance Management | 3 | 0 | 0 | 3 | 3 |
| 3 | Theory | CSE11451 | Cyber security in Banking | 3 | 0 | 0 | 3 | 3 |
| 4 | Practical | CSE12452 | FLEXCUBE Universal Banking-II Lab. | 0 | 0 | 3 | 3 | 2 |
| **Total** | | | | **9** | **0** | **3** | **12** | **11** |

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| **CSE11443** | Introduction to Banking Management | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basic accounts knowledge** | | | | |
| **Co-requisites** | **-** | | | | |

**Course Objectives:**

1. To **provide** the student with the conceptual framework necessary to analyze and comprehend the current problems confronting managers in banking and other financial institutions.
2. To **explore** how banks are chartered by state and federal authorities. Including, the concepts of branch expansion and targeting markets for bank growth.
3. To **understand** the different types of organizations used in the banking and financial service industries and the competition that is involved.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Understand** the basic concepts of management.

CO2. **Remember** the different types of Planning.

CO3. **Experiment with** the Structure of Organization.

CO4. **Summarize** the delegation of Authority and Responsibility.

CO5. **Understand** the need and importance of Direction, Coordination and Control.

**Catalog Description:**

This course introduces basic concepts in banking management system to solve various problems. All the lectures will be devoted on discussions of basic theories and advanced topics, focusing on practical implementation of knowledge. Classes will be conducted by lecture as well as power point presentation, audio visual virtual lab session. The tutorials will familiarize the students with practical problem-solving techniques led by the course coordinator. Students will strongly grab the basic concepts of the subject via exercise and discussions with the course coordinator.

**Course Content:**

**Unit-I 6 Lecture Hours**

An Overview of Banking industry; Banking and Financial reforms in India; Definition of Banks, Types of Banks, Principles and main functions of Banking

**Unit II: 9 Lecture Hours**

Banking System in India, Overview of RBI, Public, Private, Co-operative, Payment Bank; Rural banking- Regional Rural Banks ; role of NABARD & SIDBI; Other Banking and Financial Institutions- SEBI, EXIM Bank, DICGC, NBFC

**Unit III: 5 Lecture Hours**

Regulatory Architecture – Overview of Banking Regulation Act 1949, Banking Regulation Act(Amendment 2015), Payment and Settlement Act 2007, Negotiable Instrument Act 1881

**Unit IV: 9 Lecture Hours**

Principal Banking concepts- Negotiable instruments: concept, types (Promissory notes, cheque, Bill of Exchange, Hundis, bank drafts); Bank accounts- features and types; Plastic money- Bank cards; Other banking features- loans , mortgages and their types, Types of payment and settlement systems- RTGS, NEFT, EFT, HVC, CTS, ECS, NECS, NPCI

**Unit V: 10 Lecture Hours**

Developments in banking sector Core banking solution ( CBS) , Green banking, ATMs and Micro ATMs; Norms and regulations- Basel Framework, Credit control methods; Loan syndication and credit appraisal ; Credit rating system and role of CIBIL; Banking Ombudsman

**Unit VI: 6 Lecture Hours**

Risks in Banking Sector, concept, types and management of NPA, money laundering and Anti-money laundering, Enhancing branch performance

**Text Books:**

1. Banking in India- Ujjwala Shahi

2. Indian Banking- R Parameswaran

**Reference Books:**

1. Banking reforms in India- M.S. Shetty

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and Pos** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understand** the basic concepts of management. | **PO2, PO3, PO4, PSO4** |
| **CO2** | **Remember** the different types of Planning. | **PO2, PO3, PO11 PSO4** |
| **CO3** | **Experiment with** the Structure of Organization. | **PO2, PO3, PO4, PSO4** |
| **CO4** | **Summarize** the delegation of Authority and Responsibility. | **PO2, PO3, PO11, PSO4** |
| **CO5** | **Understand** the need and importance of Direction, Coordination and Control. | **PO11, PSO4** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. | Understand the concepts of commerce and computer application operations. Students will be able to apply domain knowledge for computer programming and implementing the same in E-Commerce and Insurance sector. Students can design the accounting system and processes for e-commerce, e-business and Insurance. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE11443 | Introduction to Banking Management | - | 2 | 2 | 2 | - | - | - | - | - | - | 2 | - | - | - | - | 3 |

1=weakly mapped 2= moderately mapped 3=strongly mapped

**Model Question Paper**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | |
| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING AND TECHNOLOGY**  **END-SEMESTER EXAMINATION**  **Name of the Program: BCA in Banking, Financial Services and Insurance Semester: IV**  **Code- CSE11443 Stream- CSE**  **Time: 03 Hrs.**  **Paper title– Introduction to Banking Management Total pages- 1**  **Max. Marks: 50 Total no. of questions- 12**  **Instructions:**  Attempt All Questions from **Section A** (Each Carrying 1 Marks); any **Three Questions** from **Section B** (Each Carrying 5 Marks). **Any Two Questions from Section C** (Each Carrying 10 Marks).  **1. At top of sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam.**  **2. Assumptions made if any, should be stated clearly at the beginning of your answer.**  **3. All parts of a Question should be answered consecutively.** | | | |
| **Section A (**Answer **All the Questions) (5 x 1 = 5)** | | | |
| 1. | **Define** demography. | **R** | **CO1** |
| 2. | **What are** Planning premises? | **R** | **CO1** |
| ­­­3. | **Explain** scalar chain. | **U** | **CO1** |
| 4. | **What** is mission? | **R** | **CO2** |
| 5. | **Interpret** Fatigue study. | **U** | **CO2** |
| **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** | | | |
| 6. | **Classify** Organizational Planning | **U** | **CO1** |
| 7. | **Identify** the difference between Herzbeg’s hygiene and motivation factors and give three examples. | **Ap** | **CO2** |
| 8. | **Show** the stages of planning process. | **U** | **CO5** |
| 9. | **What** is stack holder analysis? | **R** | **CO5** |
| **SECTION C (**Attempt Any **Two Questions) (2 x 10 = 20)** | | | |
| 10. | **Solve** the H.Fayol’s principles of Management with example | **Ap** | **CO2** |
| 11. | **Summarize** the macro environmental factors which influencing business. | **U** | **CO4** |
| 12. | **Define** the role of manager. | **R** | **CO3** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CSE11444** | Banking and Economy | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basic knowledge of Commerce** | | | | |
| **Co-requisites** | **-** | | | | |

**Course Objectives:**

1. To **study** the role played by banks in modern monetary economies and financial markets, including issues arising from bank regulation, the role of banks in financial intermediation, and the significance of bank behaviour in monetary policy.
2. To **understand** several key models and concepts of monetary economics and banking theory.
3. To **apply** to current events key models and concepts of monetary economics and banking theory.
4. To **appreciate** the potential importance of monetary phenomenon in the economy.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Explain** the transaction approach and cash balance approach of quantity theory of money

CO2. **Define** the process of credit creation of a commercial bank, describe the balance sheet ofa commercial bank,

explain the functions of commercial bank

CO3. **Explain** the various functions of central bank

CO4. **Define** the various phases of business cycle, explain the Hawtrey’s theory of trade cycle

CO5. **Explain** the main objective of monetary policy in under developed countries

CO6.**Explain** the functions and constituents of financial system, explain money market, capital market and stock market.

**Catalog Description:**

This course introduces basic concepts in banking and economy system to solve various problems. All the lectures will be devoted on discussions of basic theories and advanced topics, focusing on practical implementation of knowledge. Classes will be conducted by lecture as well as power point presentation, audio visual virtual lab session. The tutorials will familiarize the students with practical problem-solving techniques led by the course coordinator. Students will strongly grab the basic concepts of the subject via exercise and discussions with the course coordinator.

**Course Content:**

**Unit-I 4 Lecture Hours**

Function of Central & Commercial Banks

**Unit II: 6 Lecture Hours**

Introduction to Capital market- Primary Market; Secondary Market; Derivatives Market; OTC Market

**Unit III: 10 Lecture Hours**

Introduction to Money market: Concept of Money Market; Money market instruments- Promissory note, Bill of Exchange, Treasury Bills, Call and Notice Money, Inter-bank Term Market, Inter-bank Term Market, Certificate of Deposits, Banker's Acceptance; Banking Acts- Banking regulation Act, FEMA, FERA; Financial Inclusions, Microfinance.

**Unit IV: 10 Lecture Hours**

Determination of price level and Inflation; Concept of budget; Fiscal policy; Different banking rates- bank rate, SLR, CRR, repo rate , reverse repo rate; RBI & Monetary Policy- features (including instruments of monetary policy), importance (including goals and effects) ; minimum reserve system of RBI, National Income

**Unit V: 5 Lecture Hours**

Currency Circulation and Management in India; role of bank; Practical projects

**Unit VI: 10 Lecture Hours**

International banking and Economic Reforms- Foreign Investment; FDI, FII ; India’s Foreign Trade, Balance of Payment and EXIM Policy; Types of foreign accounts in India; Trade Finance- Letter of Credit, Bank Guarantee; International Institutions : World Bank, IMF, UNCTAD, WTO, EEC, ADB, SAPTA, NAFTA, Free Trade Zones,Common Markets, Asian Development Bank, IFC; Present scenario in global economy

**Text Books:**

1. Dipankar Dasgupta : The Macroeconomy, OUP.
2. Apte, PG : International Financial Management, Tata McGraw Hill

**Reference Books:**

1. M.V.Kulkarni. International Marketing Mgmt., EPH

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Explain** the transaction approach and cash balance approach of quantity theory of money | **PO2, PO3, PO4** |
| **CO2** | **Define** the process of credit creation of a commercial bank, describe the balance sheet of a commercial bank, explain the functions of commercial bank | **PO2, PO4, PO3, PSO4** |
| **CO3** | **Explain** the various functions of central bank | **PO3, PO4, PSO4** |
| **CO4** | **Define** the various phases of business cycle, explain the Hawtrey’s theory of trade cycle | **PO11, PSO4** |
| **CO5** | **Explain** the main objective of monetary policy in under developed countries | **PO2, PO3, PO4, PO11, PSO4** |
| **CO6** | **Explain** the functions and constituents of financial system, explain money market, capital market and stock market | **PO2, PO3, PO11, PSO4** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. | Understand the concepts of commerce and computer application operations. Students will be able to apply domain knowledge for computer programming and implementing the same in E-Commerce and Insurance sector. Students can design the accounting system and processes for e-commerce, e-business and Insurance. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE11444 | Banking and Economy | - | 2 | 2 | 2 | - | - | - | - | - | - | 3 | - | - | - | - | 3 |

1=weakly mapped 2= moderately mapped 3=strongly mapped

**Model Question Paper**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | |
| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING AND TECHNOLOGY**  **END-SEMESTER EXAMINATION**  **Name of the Program: BCA in Banking, Financial Services and Insurance Semester: IV**  **Code-CSE11444 Stream- CSE**  **Time: 03 Hrs.**  **Paper title– Banking and Economy Total pages- 1**  **Max. Marks: 50 Total no. of questions- 12**  **Instructions:**  Attempt All Questions from **Section A** (Each Carrying 1 Marks); any **Three Questions** from **Section B** (Each Carrying 5 Marks). **Any Two Questions from Section C** (Each Carrying 10 Marks).  **1. At top of sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam.**  **2. Assumptions made if any, should be stated clearly at the beginning of your answer.**  **3. All parts of a Question should be answered consecutively.** | | | |
| **Section A (**Answer **All the Questions) (5 x 1 = 5)** | | | |
| 1. | **Classify** the components of money supply. | **U** | **CO1** |
| 2. | **Define** Bank rate. | **R** | **CO1** |
| ­­­3. | **Explain** the component(s) of **Monetary Policy**. | **U** | **CO1** |
| 4. | **What** is/are the purpose/purposes of the ‘Marginal Cost of Funds based Lending Rate (MCLR)’ announced by RBI? | **R** | **CO2** |
| 5. | **What** is money creation or credit creation? | **R** | **CO2** |
| **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** | | | |
| 6. | **Develop** the concept ‘banker to the government’ function of the Central Bank | **Ap** | **CO1** |
| 7. | **Construct** the “Bankers’ Bank function” of the central bank. | **Ap** | **CO2** |
| 8. | **What** is meant by statutory liquidity ratio (SLR)? State the effect of rise in rate of SLR on creation of credit. | **R** | **CO6** |
| 9. | **Explain** any two functions of a Central Bank. | **U** | **CO5** |
| **SECTION C (**Attempt Any **Two Questions) (2 x 10 = 20)** | | | |
| 10. | **Solve** the H.Fayol’s principles of Management with example | **Ap** | **CO2** |
| 11. | **Explain** Call and notice money | **U** | **CO4** |
| 12. | **Show** the role of IMF. | **U** | **CO3** |

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| **CSE11445** | Customer Relationship Management in Banking | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basic accounts knowledge** | | | | |
| **Co-requisites** | **-** | | | | |

**Course Objectives:**

1. To **make** the students understand the organizational need, benefits and process of creating long-term value for individual customers.
2. To **disseminate** knowledge regarding the concept of e-CRM and e-CRM technologies.
3. To **enable** the students, understand the technological and human issues relating to implementation of Customer Relationship Management in the organizations

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Identify** the basic concepts of Customer relationship management.

CO2. **Explain** the marketing aspects of Customer relationship management.

CO3. **Build** basics of analytical Customer relationship management.

CO4. **Find** basics of operational Customer relationship management.

**Catalog Description:**

Customer Relationship management is very important in this era of cutthroat competition. This course will help students to understand the organizational need, benefits and process of creating long-term value for individual customers. This course includes topics to disseminate knowledge regarding the concept of e-CRM and e-CRM technologies that enables the students understand the technological and human issues relating to implementation of Customer Relationship Management in the organizations. The teaching methodology includes power point lectures, case studies, articles, group discussions, role-plays and presentations. This course will enable students to demonstrate their comprehension of marketing concepts and knowledge by applying those in their written exams, case studies discussions, presentations and projects. Course will enable them to apply the CRM concepts practically and illustrate those through a written report and presentation. The course methodology thus encourages students to explore for themselves the role of a marketing manager and the boundaries of marketing.

**Course Content:**

**Unit-I 10 Lecture Hours**

Introduction to Customer Relationship Management (CRM); concept of CRM, purpose and importance in the banking industry

**Unit II: 17 Lecture Hours**

Factors that influence the development of long-term relations between banks and customers ; CRM Strategy- customer segmentation; Challenges Faced by Banks in Successful Implementation of CRM ; CRM processes- Implementing Customer Relationship Management;

**Unit III: 18 Lecture Hours**

Technological support in Customer Relationship Management; selection and use of CRM software in Bank and Insurance sector ; technological tools- Electronic Point of Sale (EPOS), Sales Force Automation, Customer Service Helpdesk, Call Centers; Recent trends in Customer Relationship Management (CRM); interaction with the real life CRM tools

**Text Books:**

1. Customer Relationship Management in Banking Industry- Sateesh Hari
2. Customer Relationship Management in Indian Banking Industry- R.K. Uppal

**Reference Books:**

1. Customer Relationship Management in Banks- Bilal Afsar

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Identify** the basic concepts of Customer relationship management. | **PO2, PO4, PO3, PSO1** |
| **CO2** | **Explain** the marketing aspects of Customer relationship management. | **PO2, PO3, PO4, PO9, PSO1** |
| **CO3** | **Build** basics of analytical Customer relationship management. | **PO3, PO4, PO6, PO12, PSO4** |
| **CO4** | **Find** basics of operational Customer relationship management. | **PO6, PO9, PSO1, PSO4** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. | Understand the concepts of commerce and computer application operations. Students will be able to apply domain knowledge for computer programming and implementing the same in E-Commerce and Insurance sector. Students can design the accounting system and processes for e-commerce, e-business and Insurance. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE11445 | Customer Relationship Management | - | 2 | 2 | 3 | - | 2 | - | - | 2 | - | - | 2 | 3 | - | - | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | |
| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING AND TECHNOLOGY**  **END-SEMESTER EXAMINATION**  **Name of the Program: BCA in Banking, Financial Services and Insurance Semester: IV**  **Code-CSE11445 Stream- CSE**  **Time: 03 Hrs.**  **Paper title– Customer Relationship Management in Banking Total pages- 2**  **Max. Marks: 50 Total no. of questions- 12**  **Instructions:**  Attempt All Questions from **Section A** (Each Carrying 1 Marks); any **Three Questions** from **Section B** (Each Carrying 5 Marks). **Any Two Questions from Section C** (Each Carrying 10 Marks).  **1. At top of sheet, clearly mention Name, Roll No., Enrolment No., Paper Name & Code, and Date of Exam.**  **2. Assumptions made if any, should be stated clearly at the beginning of your answer.**  **3. All parts of a Question should be answered consecutively.** | | | |
| **Section A (**Answer **All the Questions) (5 x 1 = 5)** | | | |
| 1. | **Explain** your understanding of customer club? | **U** | **CO1** |
| 2. | **Explain** the significance of CRM to the stakeholders. | **U** | **CO1** |
| ­­­3. | **Define** customer retention | **R** | **CO1** |
| 4. | **What** are the attributes of ERP? | **R** | **CO2** |
| 5. | **Explain** call centre dictionary. | **U** | **CO2** |
| **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** | | | |
| 6. | **Identify** how can the outcomes of a retention analysis be used in a marketing campaign? | **Ap** | **CO2** |
| 7. | **Experiment with** the difference between differences in segmentation arise between the business and the consumer markets? | **Ap** | **CO3** |
| 8. | **Outline the** role do loyalty programmes play in the relationship policy? | **U** | **CO2** |
| 9. | **Classify** the learning organization for a company with a CRM strategy and CRM systems. | **U** | **CO4** |
| **SECTION C (**Attempt Any **Two Questions) (2 x 10 = 20)** | | | |
| 10. | The traditional shopkeeper who still maintains personal contact with their customers is considered to have more (implicit) knowledge of their customers than the CRM manager with expensive software and databases at their disposal.  (a) Do you agree with this statement? **Solve** your answer with proper justification  (b) In what areas does the (implicit) customer knowledge fall short? Give an explanation.  (c) **Identify** why is it that the CRM manager appears to lag behind the classic shopkeeper? | **Ap** | **CO2** |
| 11. | The quality of capacity planning is a direct influence on the call centre’s availability. **What** are your recommendations to a call centre manager who is unable to make an accurate prediction of the size and composition of the in- and outbound message traffic via the telephone and the internet? | **R** | **CO4** |
| 12. | You are a customer intelligence manager and would like the approval of senior management for investment in improving data quality. You have ten minutes to present your argument to the board. **Explain** the essence of this argument. | **U** | **CO2** |

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| **CSE11446** | Financial Management | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basics of Finance/Banking** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To give a brief overview of Wealth Maximization; Profit V/s Value Maximization.
2. To enable Basic, Simple and Compound Interest Rates, Techniques precision at workplace.
3. To give the students a perspective to Discounted Pay Back Method.
4. To enable students, study the structure of Factors affecting Cost of Capital.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1**. Understand** the Architecture ofFinancial Management.

CO2. **Compare** and analyse Concept ofand Objectives of Financial Management.

CO3**. Explore** Network Convergence Annuity, perpetuity; Amortization.

CO4**. Classify** Capital Budgeting- nature, purpose etc.

CO5**. Analyze** System Model Time value of money- Present value and future value.

**Catalog Description:**

The main objective of financial management is to coordinate elements of banking activity with a view to generating profits. While doing so, finance management ensures an optimal and organic system of interaction those elements. One can come across many definitions of finance management. Usually finance management means the process of governing the bank’s statutory activities. finance management can be defined by the particular object of management – financial activities connected with banking concerns. Bank management also concerns the application of management functions in the finance sector.

**Course Content:**

**Unit I: 6 lecture hours**

Introduction to Financial Management- Meaning and Importance of Financial Management; Scope of Financial Management ; Functions and Objectives of Financial Management; goals of a firm; Profit Maximization and Shareholders Wealth Maximization ; Profit V/s Value Maximization

**Unit II: 7 lecture hours**

Time value of money- Present value and future value; Simple and Compound Interest Rates, Techniques of Discounting ; Annuity, perpetuity; Amortization

**Unit III: 10 lecture hours**

Working Capital Management- Concept, Nature of Working Capital, Planning of Working Capital; Working Capital Issues; Financing Current Assets (Short Term and Long Term); Estimation of Working Capital

**Unit IV: 10 lecture hours**

Investment Decisions : Capital Budgeting- nature, purpose , process; techniques- NPV, IRR, Discounted Pay Back Method

**Unit V: 12 lecture hours**

Financial Decisions: A) Cost of Capital: Introduction and Definition of Cost of Capital ; Measurement of Cost of Capital ; Weighted average Cost of Capital ; Factors affecting Cost of Capital. B) Capital Structure Decisions: Meaning and Choice of Capital Structure ;Importance of Optimal Capital Structure ; Capital Structure Theoriestracking.

**Text Books:**

1. A Damodaran : Corporate Finance , Wiley

2. Prasanna Chandra : Financial Management - Theory & Practice, Tata McGraw Hill

**Reference Books:**

1. Van Horne and Wachowicz : Fundamentals of Financial Management, Prentice Hall

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | Understand the Architecture of Financial Management. | **PO1, PSO2, PSO3** |
| **CO2** | Compare and analyse Concept of and Objectives of Financial Management. | **PO1,PO2, PO3, PSO1,PSO4, PSO3** |
| **CO3** | Explore Network Convergence Annuity, perpetuity; Amortization. | **PO1, PO2, PO3, PO4, PSO1, PSO2,PO12** |
| **CO4** | Classify Capital Budgeting- nature, purpose etc. | **PO1,PO8, PO9, PO12, PSO2, PSO4** |
| **CO5** | Analyze System Model Time value of money- Present value and future value | **PO1, PO8, PO12, PSO3,PSO2, PSO4** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. | Understand the concepts of commerce and computer application operations. Students will be able to apply domain knowledge for computer programming and implementing the same in E-Commerce and Insurance sector. Students can design the accounting system and processes for e-commerce, e-business and Insurance. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE11446 | Financial Management | 3 | 2 | 2 | 2 | - | - | - | 2 | - | - | - | 2 | 2 | 3 | 2 | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Banking, Financial Services and Insurance

Semester: V Stream: CSE

PAPER TITLE: Financial Management PAPER CODE: CSE11446

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **List** the steps involved in Capital Budgeting | **U** | **CO1** |
| 2. | **Enumerate** the basic elements of SI and CI. | **U** | **CO2** |
| ­­­ 3. | **Define** Weighted average Cost of Capital. | **R** | **CO3** |
| 4. | **What** is Cost analysis of Capital? | **R** | **CO4** |
| 5. | **Give** the principles of NPV, IRR. | **U** | **CO3** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Describe** the characteristics of Constrained Application of decision payback method. | **U** | **CO1** |
| 7. | **Examine** Why is security for banking so hard? And **its Inference** with your own example. | **U** | **CO1, CO2** |
| 8. | **Elucidate** the factors influencing banking security. | **An** | **CO3** |
| 9. | **Explain** with Example: i) Smart banking ii) Reliability Coefficient of smart banking. | **U** | **CO4 /CO5** |
|  | **SECTION C(Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Explain** in detail about banking automation. | **U** | **CO4** |
| 11. | **Write** a Quality Control **Plan** for the Techniques of Discounting. | **R** | **CO4** |
| 12. | **Distinguish** Data consistency Financing Current Assets (Short Term and Long Term) | **An** | **CO5** |

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| --- | --- | --- | --- | --- | --- |
| **CSE11447** | Universal Banking | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basics of banking system** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To give a brief overview of Wealth Maximization; Profit V/s Value Maximization.
2. To enable Basic, Simple and Compound Interest Rates, Techniques precision at workplace.
3. To give the students a perspective to Discounted Pay Back Method.
4. To enable students, study the structure of Factors affecting Cost of Capital.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Understand** the Architecture ofuniversal banking Management.

CO2. **Analyse** effectively Concept of and Objectives of banking for all.

CO3**. Explore** Network Convergence Annuity, perpetuity; Amortization in universal banking.

CO4. **Compare**Capital Budgeting- nature, purpose etc.

CO5**. Classify** System Model Time value of money- Present value and future value.

**Catalog Description:**

Banking is an industry that handles cash, credit, and other financial transactions. Universal banking provides a [safe place to store extra cash and credit](https://www.thebalance.com/best-bank-accounts-4582898). They offer savings accounts, [certificates of deposit](https://www.thebalance.com/certificates-of-deposit-3305913), and checking accounts. Banks use these deposits to make loans. These loans include home mortgages, business loans, and car loans.

Universal Banking is one of the key drivers of the country economy. It [provides the liquidity](https://www.thebalance.com/liquidity-definition-ratios-how-its-managed-3305939) needed for families and businesses to invest in the future.

**Course Content:**

**Module 1: 08 lecture hours**

Concept of universal bank; Evolution of Universal banking; importance in recent time

**Module II: 07 lecture hours**

Functions of universal banking; advantages and disadvantages

**Module III: 15 lecture hours**

Services to Government, Payment & Settlement, Merchant Banking, Mutual Fund, Depository Services, Wealth Management, Portfolio Management Bancassurance, NRI Remittance; Universal banking by RBI and other banks

**Module IV: 15 lecture hours**

Universal banking softwares- Finacle, BaNCS, FLEXCUBE

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|  |  |
| --- | --- |
| **Text Books:** | |
| **1.** | Khan, Indian Financial System ,TMH |
| **2.** | Universal Banking- Jordi Canals |
| **Reference Books:** | |
| **1.** | Saha, T R and Mondal A : Indian Financial System & Financial Market Operation, New Central Book Agency (P)  Ltd |

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | Understand the Architecture of universal banking Management | **PO1,PSO4** |
| **CO2** | Analyse effectively Concept of and Objectives of banking for all | **PO1,PO2, PO3, PSO1** |
| **CO3** | Explore Network Convergence Annuity, perpetuity; Amortization in universal banking. | **PO1, PO2, PO3, PO4, PSO1, PSO2,PO12** |
| **CO4** | Compare Capital Budgeting- nature, purpose etc. | **PO1, PO8, PO12, PSO2,PO12, PSO4** |
| **CO5** | Classify System Model Time value of money- Present value and future value. | **PO1, PO8, PO12, PSO1, PSO3,PSO2, PSO4** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. | Understand the concepts of commerce and computer application operations. Students will be able to apply domain knowledge for computer programming and implementing the same in E-Commerce and Insurance sector. Students can design the accounting system and processes for e-commerce, e-business and Insurance. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE11447 | Universal Banking | 3 | 2 | 2 | 2 | - | - | - | 2 | - | - | - | 2 | 2 | 3 | 2 | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Banking, Financial Services and Insurance

Semester: V Stream: CSE

PAPER TITLE: Universal Banking PAPER CODE: CSE11447

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **List** the steps involved in Universal banking | **U** | **CO1** |
| 2. | **Enumerate** the basic elements of banking domain. | **U** | **CO2** |
| ­­­ 3. | **Define** Extensible Messaging and Presence Protocol (XMPP) in banking. | **R** | **CO3** |
| 4. | **What** is multicast DNS for universal banking? | **R** | **CO4** |
| 5. | **Give** the principles of Localization for mobile systems in banking. | **U** | **CO3** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Describe** the characteristics of Constrained Application Protocol in universal banking  . | **U** | **CO1** |
| 7. | **Examine** Why is security for banking so hard? And **its Inference** with your own example. | **U** | **CO1, CO2** |
| 8. | **Elucidate** the factors influencing banking security. | **An** | **CO3** |
| 9. | **Explain** with Example: i) Smart healthcare ii) Reliability Coefficient of smart city. | **R** | **CO4 /CO5** |
|  | **SECTION C(Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Explain** in detail about universal banking automation. | **U** | **CO4** |
| 11. | **Write** a Quality Control **Plan** for the Managing high rate sensor data, Processing data streams in banking. | **R** | **CO4** |
| 12. | **Distinguish** Data consistency in an intermittently connected or disconnected environment to establish universal banking. | **An** | **CO5** |

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| **CSE12448** | FLEXCUBE Universal Banking -I Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Basics of SQL/Oracle** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To give a brief overview of Wealth Maximization; Profit V/s Value Maximization in flex cube.
2. To enable Flexcube Techniques precision at workplace.
3. To give the students a perspective to Flex cube software.
4. To enable students, study the structure of Factors affecting Cost of Capital

**Course Outcomes:**

CO1. **Understand** the Architecture ofFlex cube Management.

CO2**. Effectively** analyse Concept of and Objectives of Flex cube.

CO3**. Explore** Network Convergence Annuity, perpetuity; Amortization.

CO4. **Classify** analysis of Capital Budgeting- nature, purpose etc.

CO5. **Analyze** flexcube System Model Time value of money- Present value and future value.

**Catalog Description:**

Banking is an industry that handles cash, credit, and other financial transactions. Banks provide a [safe place to store extra cash and credit](https://www.thebalance.com/best-bank-accounts-4582898). They offer savings accounts, [certificates of deposit](https://www.thebalance.com/certificates-of-deposit-3305913), and checking accounts. Banks use these deposits to make loans. These loans include home mortgages, business loans, and car loans.

Banking is one of the key drivers of the country economy. It [provides the liquidity](https://www.thebalance.com/liquidity-definition-ratios-how-its-managed-3305939) needed for families and businesses to invest in the future.

**Course Content:**

1. Introduction to flex cube and its features.
2. Maintaining currency denomination in flex cube.
3. In flex cube design a currency pair.
4. Maintain a exchange rate in flex cube.
5. Maintain a currency spread for customer.
6. Design a customer table in oracle.
7. Apply oracle operation of delete, drop, update, arithmetic and logical operator.
8. Design a period code maintenance.
9. Design a transaction code maintenance.
10. In flex cube design account revaluation maintenance.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understand** the Architecture ofFlex cube Management | **PO1, PO7, PSO2** |
| **CO2** | **Analyse** Concept of and Objectives of Flex cube | **PO1,PO2, PO3, PSO1** |
| **CO3** | **Explore** Network Convergence Annuity, perpetuity; Amortization. | **PO1, PO2, PO3, PO4, PO5, PSO1, PSO2,PO12, PSO4** |
| **CO4** | **Classify** analysis of Capital Budgeting- nature, purpose etc. | **PO1, PO8, PO9, PO12, PSO2,PO12, PSO4** |
| **CO5** | **Analyse** flexcube System Model Time value of money- Present value and future value. | **PO1, PO8, PO12, PSO3,PSO2, PSO4** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. | Understand the concepts of commerce and computer application operations. Students will be able to apply domain knowledge for computer programming and implementing the same in E-Commerce and Insurance sector. Students can design the accounting system and processes for e-commerce, e-business and Insurance. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE12448 | FLEXCUBE Universal Banking-I lab | 3 | 2 | 2 | 2 | - | - | - | 2 | - | - | - | 2 | 2 | 3 | 2 | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Banking, Financial Services and Insurance

Semester: V Stream: CSE

PAPER TITLE: FLEXCUBE Universal Banking-I lab PAPER CODE: CSE12448

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

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| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 4 = 20)** | | | |
| 1. | **List** the steps involved in Architecture of flex cube and it’s features. | **U** | **CO1** |
| 2. | **Enumerate** the basic elements of Oracle. | **U** | **CO2** |
| ­­­ 3. | **Define** a table in oracle. | **R** | **CO3** |
| 4. | **What** is difference between drop and truncate command? | **R** | **CO4** |
| 5. | **Give** the principles of Union method in oracle. | **U** | **CO3** |
|  | **SECTION B (**Attempt any **Six Questions) (6 x 5 = 30)** |  | |
| 6. | **Describe** the characteristics of exchange rate in flex cube with example,  . | **U** | **CO1** |
| 7. | **Examine** Why is security for IoT so hard? And **it’s Inference** with your own example. | **U** | **CO1, CO2** |
| 8. | **Elucidate** the factors influencing currency security. | **An** | **CO3** |
| 9. | **Explain** with Example: i) Intersection in oracle ii) union all in oracle. | **R** | **CO4 /CO5** |
| 10. | **Explain** in detail about currency denomination in flexcube with example. | **U** | **CO4** |
| 11. | **Write** a Quality Control **Plan** for flex cube. | **An** | **CO4** |
| 12. | **Distinguish** transaction code maintenance in flex cube. | **An** | **CO5** |

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| **CSE11449** | Risk Management | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Knowledge of Banking principles** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To help the students to learn about risk and return in banking.

2. To enable students to learn about various types of risks

3. To give the students a perspective to the process of risk management.

4. To enable students acquire knowledge about risk mitigation and risk return trade off.

**Course Outcomes:**

On completion of this course, the students will be able to

CO1. **Understand** the importance of risk management in banking.

CO2**. Describe** the various types of risks.

CO3**. Explain** the overall process of risk management.

CO4. **Evaluate** risk mitigation and risk return trade off.

**Catalog Description:**

Risk management is an integral part of banking. This course explains the importance and objective of risk management in banking. It explains the different types of risks like market risk, credit risk and liquidity risk. It gives a detailed overview of the risk management process and risk measurement. It explains the role of RBI in risk management and risk mitigation.

**Course Content:**

**Unit I: 09 lecture hours**

Concept of risk management in banking; types of risks in banking; Objectives and importance of risk management in banking; Concepts of Risk & Return

**Unit II: 14 lecture hours**

Foundations of risk management-Financial risks- management of liquidity risk , interest rate risk, market risk, credit risk; Non – financial risks- operational risk, strategic risk, reputation risk(including fraud risk management), systematic risk, unsystematic risk,Foreign exchange risk, Asset Securitization, CDO & CDS

**Unit III: 11 lecture hours**

Process of risk management- risk identification, assessment, control, monitoring ; Techniques of risk management- GAP Analysis, Value at Risk (VaR) , Risk Adjusted Rate of Return on Capital (RAROC), Securitization, Sensitivity Analysis, Internal Rating System; Risk measurement

**Unit IV**: **11 lecture hours**

Risk Management in banks- role of RBI, CAMELS, PCA (Prompt Corrective Action) Framework as a tools of risk management; Risk Return Trade off; risk mitigation

**Text Books:**

1. Risk Management in Indian Banks-K.M. Bhattacharya
2. Risk Management in Banks-Yogesh Singh

**Reference Books:**

1. Risk Management in Banking-Joel Bessis

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understand** the importance of risk management in banking. | **PO1,PO2,PO9,PO11, PSO4** |
| **CO2** | **Describe** the various types of risks. | **PO1,PO2,PO9,PO11** |
| **CO3** | **Explain** the overall process of risk management | **PO1,PO2,PO9,PO10, PSO4** |
| **CO4** | **Evaluate** risk mitigation and risk return trade off. | **PO1,PO2,PO9,PO10,PO12, PSO4** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. | Understand the concepts of commerce and computer application operations. Students will be able to apply domain knowledge for computer programming and implementing the same in E-Commerce and Insurance sector. Students can design the accounting system and processes for e-commerce, e-business and Insurance. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE11449 | Risk Management | 3 | 3 | - | - | - | - | - | - | 3 | 2 | 2 | 2 | - | - | - | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Banking, Financial Services & Insurance Semester: VI Stream: CSE

PAPER TITLE: Risk Management PAPER CODE: CSE11449

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.

2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.

3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **What** is Internal Rating System? | **U** | **CO1** |
| 2. | **Enumerate** the basic elements of GAP analysis. | **U** | **CO3** |
| ­­­ 3. | **Define** Risk mitigation | **R** | **CO4** |
| 4. | **What** is Risk management? | **R** | **CO2** |
| 5. | **Give** the full form of RAROC. | **U** | **CO4** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Describe** the process of risk management. | **U** | **CO1** |
| 7. | **Examine** the process of risk mitigation with a suitable example. | **Ap** | **CO4** |
| 8 | **Elucidate** the role of RBI in risk management. | **R** | **CO4** |
| 9. | **Explain** with Example: i) Liquidity risk ii) Credit risk | **U** | **CO2** |
|  | **SECTION C (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Explain** in detail about Prompt Corrective Action (PCA). | **U** | **CO4** |
| 11. | **Write** short notes on Risk management. | **U** | **CO4** |
| 12. | **Distinguish** between Financial and Non-financial risks. | **An** | **CO2** |

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| **CSE11450** | Insurance Management | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Knowledge of Banking principles** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To help the students to learn about insurance management in today’s life.

2. To enable students to learn about insurance contract and related terminology.

3. To give the students a perspective to different types of insurance.

4. To enable students acquire knowledge about benefits and advantages of insurance.

5. To enable students learn about risk management from Insurance perspective.

**Course Outcomes:**

On completion of this course, the students will be able to

**CO1. Understand** the importance of insurance management in banking.

**CO2. Describe** the various insurance related terminologies.

**CO3. Explain** the different types of insurance.

**CO4. Evaluate** the benefits and advantages of insurance.

**CO5. Explain** risk management from Insurance perspective.

**Catalog Description:**

Insurance management is an integral part of banking. This course explains the importance and objective of insurance management in banking. It explains the different types of insurance and its terminologies. It gives a detailed overview of benefits and advantages of insurance. It explains the risk management from Insurance perspective.

**Course Content:**

**Unit I: 04 lecture hours**

Introduction to Insurance and insurance management; purpose, significance in today’s life ( interplay towards delivering risk management)

**Unit II: 10 lecture hours**

Insurance Contract, Terminology, Elements and Principles; primary insurance

**Unit III: 15 lecture hours**

Types of Insurance- A) Life Insurance – Components (including plans, annuities, group insurance, sub products), Human Life Value Approach, Mutuality, Principle of Risk Pooling, Life Insurance Contract, Determinants of Risk Premium; B) General Insurance- Health Insurance (including retail products , group health insurance, social scheme), Property Insurance, Motor Insurance, Marine Insurance, Fire Insurance, Liability Insurance, Guarantee Insurance, Social Insurance- hazards and risks associated in them and role of insurance; Key Insurance concepts- risk premium, indemnity, agent, arbitration, sum assured, Certificate of Insurance, contract, co-insurance, consideration, Cooling off period, Effective date, Ex gratia payment, proposer, Reinsurance, Underwriter; Insurance organizations, Insurers, brokers, TPAs, surveyors; overview of claims and actuarial

**Unit IV**: **08 lecture hours**

Benefits and advantages of insurance; Insurance corporations and intermediaries; role of IRDAI and its regulations

**Unit V: 08 lecture hours**

Overview of Risk Management from Insurance perspective; Identifying Loss Exposures; Selecting Risk Control and risk Financing Techniques.

**Text Books:**

1. Insurance Management- AnandGanguly
2. Insurance Management- K.C. Sharma

**Reference Books:**

1. Principles of Insurance Management- Neelam C Gulati

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understand** the importance of insurance management in banking. | **PO1,PO2,PO9,PO11, PSO4** |
| **CO2** | **Describe** the various insurance related terminologies. | **PO1,PO2,PO11** |
| **CO3** | **Explain** the different types of insurance. | **PO1,PO2,PO9,PO11, PSO4** |
| **CO4** | **Evaluate** the benefits and advantages of insurance. | **PO1,PO2,PO12, PSO4** |
| **CO5** | **Explain** risk management from Insurance perspective. | **PO1,PO2,PO10, PSO4** |

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|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. | Understand the concepts of commerce and computer application operations. Students will be able to apply domain knowledge for computer programming and implementing the same in E-Commerce and Insurance sector. Students can design the accounting system and processes for e-commerce, e-business and Insurance. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE11450 | Insurance Management | 3 | 3 | - | - | - | - | - | - | 2 | 2 | 3 | 2 | - | - | - | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Banking, Financial Services & Insurance Semester: VI Stream: CSE

PAPER TITLE: Insurance Management PAPER CODE: CSE11450

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.

2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.

3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **What** is Insurance management? | **R** | **CO1** |
| 2. | **Enumerate** the components of life insurance. | **U** | **CO3** |
| ­­­ 3. | **Define** Social insurance. | **R** | **CO3** |
| 4. | **What** is the role of IRDAI in insurance management? | **R** | **CO2** |
| 5. | **Define** risk premium. | **R** | **CO4** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Describe** the role of insurance management in today’s life. | **U** | **CO1** |
| 7. | **Examine** any two types of Insurance. | **U** | **CO3** |
| 8. | **Explain** any two key insurance concepts. | **U** | **CO4** |
| 9. | **Explain** with Example: i) Health insurance ii) Motor insurance | **U** | **CO3** |
|  | **SECTION C(Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Explain** in detail about ex-gratia payment. | **U** | **CO4** |
| 11. | **Write** short notes on Risk management from Insurance perspective. | **U** | **CO5** |
| 12. | **Distinguish** between General insurance and Life insurance. | **An** | **CO2** |

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| **CSE11451** | Cyber Security in Banking | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Cryptography** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To understand of information assurance as practiced in computer operating systems, distributed systems, networks and representative applications.
2. To demonstrate the familiarity with prevalent network and distributed system attacks, defences against them, and forensics to investigate the aftermath.
3. Appraise a basic understanding of cryptography, how it has evolved, and some key encryption techniques used today.
4. Examine security policies (such as authentication, integrity and confidentiality), as well as protocols to
5. Evaluate such policies in the form of message exchanges.

**Course Outcomes:**

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| --- | --- | --- |
| CO1.  CO2. | | **Understand** the basics of System and Network Vulnerability Scanning.  **Demonstrate** and practice the application of Network Protection tools. |
| CO3. **Appraise** the application of different types of tools against web vulnerabilities.  CO4. **Examine** Cyber Crime and Law.  CO5. **Evaluate** Cyber Crime Investigation**.** | | |

**Course Description:**

Information Technology systems need to ensure the confidentiality, integrity, and availability of information. This course introduces students the principles of network and operating system security through hands-on exploration. Students learn how to harden an operating system as well as secure the network by implementing technologies such as firewalls, Virtual Private Networks (VPN), and Intrusion Detection Systems (IDS).

**Course Content:**

**Unit I: 9 lecture hours**

**Systems Vulnerability Scanning:** Open Port / Service Identification, Banner / Version Check, Traffic Probe, Vulnerability Probe, Vulnerability Examples, OpenVAS, Metasploit.

**Networks Vulnerability Scanning:** Netcat, Socat, understanding Port and Services tools - Datapipe, Fpipe, WinRelay, Network Reconnaissance – N map, THC-A map and System tools.

**Network Sniffers and Injection tools:** Tcp dump and Win dump, Wireshark, Ettercap

**Unit II: 9 lecture hours**

**Network Protection tools :** Firewalls and Packet Filters, Firewall Basics, Comparison between Packet Filter and Firewall, Protection mechanism of Firewall, Packet Characteristic to Filter, Stateless and Stateful Firewalls, Network Address Translation (NAT) and Port Forwarding, the basic of Virtual Private Networks, Linux Firewall, Windows Firewall, [Snort - Network Intrusion Detection and Prevention System](https://www.google.co.in/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&cad=rja&uact=8&ved=0ahUKEwj9l-_K7_jTAhUNTo8KHdCTAhgQFggnMAA&url=https%3A%2F%2Fwww.snort.org%2F&usg=AFQjCNGcM-QbwviBIcCdsQyHnySpBKzvDA&sig2=PM8STvgTGHcJLMM-FJ_TQg)

**Unit III: 9 lecture hours**

**Protection tools against web vulnerabilities:** Nikto, W3af, HTTP utilities - Curl, OpenSSL and Stunnel, Application Inspection tools – Zed Attack Proxy, Sql map, Damn Vulnerable Web App (DVWA), Webgoat

**Password Cracking and Brute-Force Tools:** John the Ripper, L0htcrack, Pwdump, HTC-Hydra

**Unit IV: 9 lecture hours**

**Cyber Crime and law:**Cyber Crimes, Types of Cybercrime, Hacking, Attack vectors, Cyberspace and Criminal Behavior, Clarification of Terms, Traditional Problems Associated with Computer Crime, Introduction to Incident Response, Digital Forensics, Computer Language, Network Language, Realms of the Cyber world, A Brief History of the Internet, Recognizing and Defining Computer Crime, Contemporary Crimes, Computers as Targets, Contaminants and Destruction of Data, Indian IT ACT 2000. 10

**Unit V: 9 lecture hours**

**Cyber Crime Investigation :** Firewalls and Packet Filters, password Cracking, Keyloggers and Spyware, Virus and Warms, Trojan and backdoors, Steganography, DOS and DDOS attack, SQL injection, Buffer Overflow, Attack on wireless Networks

|  |  |
| --- | --- |
| **Text Books** | |
| 1 | “Anti-Hacker Tool Kit (Indian Edition)”, Mike Shema, Publication McGraw Hill |
| 2 | " Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives”, Nina Godbole and SunitBelpure, Publication Wiley |

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Components** | **Internal Assessment** | **Mid Semester Examination** | **End Semester Examination** |
| **Weightage (%)** | **30** | **20** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understand** the basics of System and Network Vulnerability Scanning. | **PO1, PO3** |
| **CO2** | **Demonstrate** and practice the application of Network Protection tools. | **PO1, PO6** |
| **CO3** | **Appraise** the application of different types of tools against web vulnerabilities. | **PO3, PO5, PSO4** |
| **CO4** | **Examine** Cyber Crime and Law. | **PO1, PO6, PSO4** |
| **CO5** | **Evaluate** Cyber Crime Investigation**.** | **PO3, PO6, PSO4** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex problems | Modern tool usage | The engineer and society | Environment and sustainability | Ethics | Individual and team work | Communication | Project management and finance | Life-long Learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. Analyze and synthesis computing systems through quantitative and qualitative techniques. | Analyze and synthesis computing systems through quantitative and qualitative techniques. | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. Analyze and synthesis computing systems through quantitative and qualitative techniques. | Understand the concepts of commerce and computer application operations. Students will be able to apply domain knowledge for computer programming and implementing the same in E-Commerce and Insurance sector. Students can design the accounting system and processes for e-commerce, e-business and Insurance. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE11451 | Cyber Security in banking | 3 | - | 2 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Banking, Financial Services and Insurance

Semester: VI Stream: CSE

PAPER TITLE: Cyber Security in Banking PAPER CODE: CSE11451

Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **Describe** the OpenSSL and Stunnel. | **U** | **CO1** |
| 2. | **Explain** the HTC-Hydra . | **Evaluate** | **CO1** |
| 3. | **Describe** Cyber Crimes | **U** | **CO1** |
| 4. | **Explain** Digital Forensics. | **Evaluate** | **CO2** |
| 5. | **Describe** Contaminants and Destruction of Data | **U** | **CO2** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Write** Firewalls and Packet Filters | **Ap** | **CO1** |
| 7. | **Examine** Steganography | **Ap** | **CO2** |
| 8. | **Describe** DOS and DDOS attack. | **U** | **CO6** |
| 9. | **Describe** with Example: i) XSS attack ii) Sql injection | **U** | **CO3, CO5** |
|  | **SECTION C (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Write** the steps of IT assessments or audits | **Ap** | **CO2** |
| 11 | **Write** the steps of Cross-site scripting (XSS). | **Ap** | **CO4** |
| 12. | **Describe** SQL injection and Cross-Site Request Forgery (CSRF) in details. | **U** | **CO3** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **CSE12452** | FLEXCUBE Universal Banking -II Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **FLEXCUBE Universal Banking-I lab** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To get an overview of the technical architecture.
2. To understand the standard naming conventions of various DB and front-end objects.
3. To learn to install Oracle FLEXCUBE Development Workbench Tool.
4. To understand the extensibility features of Oracle FLEXCUBE UBS.

**Course Outcomes:**

CO1. **Understand** the Architecture ofOracle FCUB Development Toolkit, Dev & Extensibility.

CO2**. Construct** structures using FLEXCUBE development workbench tool.

CO3**. Design** using various components of an FCUB screen.

**Catalog Description:**

The Flexcube Universal Banking-II lab is designed to cover specific elements relating to the "Extensibility" tool kit and the extent to which the boundaries of this toolkit can be stretched. Expert Oracle instructors will teach you how to design new modules, functionalities and screens by the customer or the partner; you will also explore features such as new screens, user interface extensions, custom handlers, business logic callouts, system data elements and style sheet editor.

**Course Content:**

1. Perform the Oracle FLEXCUBE Development Workbench Tool installation and setup.
2. Design an Oracle FLEXCUBE development workbench tool screen.
3. Understand the Oracle FLEXCUBE UBS product extensibility.
4. Understand various components of an FCUB screen.
5. Become familiar with the Oracle FLEXCUBE architecture.
6. Understand the Oracle FLEXCUBE object naming conventions.
7. Grasp an overview of Oracle FLEXCUBE development workbench tool.
8. Design a new screen.
9. Add a new validation to the new or the existing screen.
10. Add/change front-end and back-end business logic.

**Modes of Evaluation: Quiz/Assignment/ presentation/ extempore/ Written Examination**

**Examination Scheme:**

|  |  |  |
| --- | --- | --- |
| **Components** | **Continuous Evaluation** | **End Semester Examination** |
| **Weightage (%)** | **50** | **50** |

**Relationship between the Course Outcomes (COs) and Program Outcomes (POs)**

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understand** the Architecture of Oracle FCUB Development Toolkit, Dev & Extensibility. | **PO1, PO2, PO4, PO6,PO9,PSO2, PSO1** |
| **CO2** | **Construct** structures using FLEXCUBE development workbench tool. | **PO1, PO3, PO5, PSO3, POS4, PSO1** |
| **CO3** | **Design** using various components of an FCUB screen. | **PO1, PO2, PSO1, PSO2** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational knowledge | Design/development of solutions | Conduct investigations of complex problems | Problem analysis | The engineer and society | Communication | Modern tool usage | Environment and sustainability | Ethics | Individual and team work | Project management and finance | Life-long learning | To engage in professional development and to pursue post graduate education in the fields of Information Technology and Computer Applications. | To provide the students about computing principles and business practices in software solutions, outsourcing services, public and private sectors. | Analyze and synthesis computing systems through quantitative and qualitative techniques. | Understand the concepts of commerce and computer application operations. Students will be able to apply domain knowledge for computer programming and implementing the same in E-Commerce and Insurance sector. Students can design the accounting system and processes for e-commerce, e-business and Insurance. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 | PSO4 |
| CSE12452 | FLEXCUBE Universal Banking-II lab | 3 | 2 | - | - | - | - | - | - | 2 | - | - | - | 3 | 2 | 2 | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: BCA in Banking, Financial Services and Insurance

Semester: VI Stream: CSE

PAPER TITLE: FLEXCUBE Universal Banking -II lab PAPER CODE: CSE12452

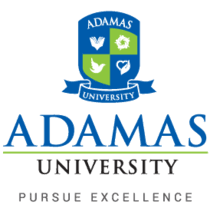
Maximum Marks: 50 Time duration: 3 hours

Total No of questions: 12 Total No of Pages: 01

**Instruction for the Candidate:**

1. At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, and Date of Exam.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **SECTION A(5 x 10 = 50)** |  | |
|  | **Design** an Oracle FLEXCUBE development workbench tool screen. | **U** | **CO1** |
|  | **Design** an interface using components of an FCUB screen | **U** | **CO1, CO2** |
|  | **Illustrate** a new validation to the new or the existing screen. | **An** | **CO2** |
|  | **Rephrase** front-end and back-end business logic. | **R** | **CO3** |
|  | **Develop** in detail a model using FLEXCUBE development workbench tool. | **U** | **CO3** |



**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING & TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**CO – PO & PSO MAPPING**

**Name of the Programme: BCA**

**Specialization: Banking, Financial Services and Insurance**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| MTH11221 | Mathematics- I | 3 | 3 | - | 2 | 2 | - | - | - | 3 | - | - | - | 2 | - | - | NA |
| CSE11401 | Introduction to Programming | 3 | 3 | 2 | 2 | - | - | - | - | - | - | - | - | 3 | - | - | NA |
| ENG11055 | English Communication | - | - | - | - | 3 | 3 | - | 2 | - | - | 3 | - | - | - | 2 | NA |
| CSE11402 | Computer Fundamentals | 3 | 2 | - | 2 | - | - | - | - | - | - | - | 2 | 2 | - | - | NA |
| EVS11103 | Environmental science | - | - | 3 | 3 | 3 | - | 3 | 2 | 3 | - | - | - | - | 2 | 3 | NA |
| CSE12403 | Programming Lab | 3 | 3 | 2 | 3 | - | - | 2 | - | - | - | - | - | 3 | - | - | NA |
| MTH11507 | Mathematics- II | 3 | 3 | - | - | - | - | - | - | 3 | - | - | 2 | - | 3 | - | NA |
| CSE11404 | Programming & Data Structures | 2 | 3 | - | 3 | - | - | - | - | - | - | - | 2 | 3 | 2 | 3 | NA |
| ECE11501 | Digital Electronics | 3 | 3 | - | 2 | 3 | - | - | - | - | - | - | 3 | - | 2 | 3 | NA |
| CSE11405 | Design of Logic Circuit | - | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 3 | - | 3 | NA |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| CSE11406 | Web Designing | - | 3 | 3 | - | 3 | 2 | - | - | - | 2 | - | 2 | 3 | 3 | - | NA |
| CSE12407 | Data Structures Lab | 3 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | 3 | 3 | 3 | NA |
| ECE12502 | Digital Electronics Lab | 3 | 2 | 3 | - | - | 3 | - | - | - | 2 | - | - | 2 | 2 | 3 | NA |
| CSE12408 | Web Designing Lab | 3 | 2 | 3 | 2 | - | - | 2 | - | - | - | - | 2 | 2 | 3 | 2 | NA |
| CSE11409 | Object Oriented Programming with JAVA | 3 | 3 | - | 3 | - | - | - | - | - | - | - | - | 3 | 3 | 3 | NA |
| CSE11410 | Programming in Python | 3 | 2 | 2 | 3 | - | - | - | - | - | - | - | - | 3 | - | - | NA |
| CSE11411 | Computer Organization & Architecture | 3 | **2** | **3** | **-** | **2** | **3** | **-** | **-** | **-** | **-** | **-** | **3** | 3 | 2 | 3 | NA |
| CSE11412 | Database Management System | 3 | 3 | 2 | 2 | - | - | 2 | - | - | - | - | 2 | 3 | 2 | 3 | NA |
| CSE12413 | Object Oriented Programming Lab | 3 | 3 | 3 | - | 2 | - | - | - | - | - | - | 3 | 3 | 3 | 3 | NA |
| CSE12414 | Python Programming Lab | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 3 | - | - | NA |
| CSE12415 | Computer Organization Lab | 3 | **-** | 3 | **-** | 3 | **-** | **-** | **-** | **-** | **-** | **-** | 3 | 3 | 3 | - | NA |
| CSE12416 | Database Management Systems Lab | 3 | 3 | 2 | 3 | - | - | 2 | - | - | - | - | 2 | 2 | 2 | 3 | NA |
| ECE11503 | Data Communication & Computer Network | 3 | 3 | 2 | 3 | 2 | - | 3 | - | - | - | - | - | 3 | - | - | NA |
| CSE11418 | Operating System | 3 | 3 | - | 3 | - | - | - | - | - | - | - | - | 3 | 3 | - | NA |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| FAC11403 | Financial Accounting | - | - | - | 2 | - | - | - | - | - | - | 2 | - | - | 3 | 3 | NA |
| CSE11443 | Introduction to Banking Management | - | 2 | 2 | 2 | - | - | - | - | - | - | 2 | - | - | - | - | 3 |
| CSE11444 | Banking and Economy | - | 2 | 2 | 2 | - | - | - | - | - | - | 3 | - | - | - | - | 3 |
| CSE11445 | Customer Relationship Management in Banking | - | 2 | 2 | 3 | - | 2 | - | - | 2 | - | - | 2 | 3 | - | - | 2 |  |
| ECE12504 | Computer Network Lab | 3 | 3 | 2 | 3 | 2 | - | 3 | - | - | - | - | - | 3 | - | - | NA |
| CSE12421 | Operating System Lab | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 3 | 2 | 3 | 3 | NA |
| CSE11446 | Financial Management | 3 | 2 | 2 | 2 | - | - | - | 2 | - | - | - | 2 | 2 | 3 | 2 | 2 |
| IST11401 | Management Information System | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | 2 | 3 | - | - | - | NA |  |
| CSE11423 | Artificial Intelligence | 3 | 2 | 2 | 2 | - | - | 2 | - | - | - | - | 2 | - | 2 | 3 | NA |
| CSE11424 | Software Engineering | 3 | 2 | 2 | 2 | - | - | 2 | - | - | - | - | 2 | 3 | 3 | 2 | NA |
| CSE11447 | Universal Banking | 3 | 2 | 2 | 2 | - | - | - | 2 | - | - | - | 2 | 2 | 3 | 2 | 2 |  |
| CSE12426 | Artificial Intelligence Lab | 3 | 2 | 2 | 2 | - | - | 2 | - | - | - | - | 2 | - | 2 | 2 | NA |
| CSE12427 | Software Engineering Lab | 3 | 2 | 2 | 2 | - | - | 2 | - | - | - | 2 | - | 2 | 3 | 2 | NA |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** | **PSO4** |
| CSE12448 | FLEXCUBE Universal Banking-I Lab | 3 | 2 | 2 | 2 | - | - | - | 2 | - | - | - | 2 | 2 | 3 | 2 | - |
| CSE14428 | Project -I | 3 | 3 | - | 2 | - | - | - | - | 2 | - | 2 | 3 | 2 | - | - | NA |
| CSE11449 | Risk Management | 3 | 3 | - | - | - | - | - | - | 3 | 2 | 2 | 2 | - | - | - | 2 |  |
| CSE11450 | Insurance Management | 3 | 3 | - | - | - | - | - | - | 2 | 2 | 3 | 2 | - | - | - | 2 |
| MKT12403 | E-commerce & Applications | 3 | 2 | 3 | 3 | - | - | - | 2 | - | - | - | - | 3 | 2 | - | NA |  |
| CSE11451 | Cyber Security in Banking | 3 | - | 2 | - | 2 | 3 | - | - | - | - | - | - | - | - | - | 2 |  |
| CSE12452 | FLEXCUBE Universal Banking II Lab | 3 | 2 | - | - | - | - | - | - | 2 | - | - | - | 3 | 2 | 2 | 2 |  |
| CSE15430 | Viva-voce | 3 | 3 | 3 | 2 | 3 | - | - | - | - | 2 | - | - | 3 | 3 | 2 | NA |
| CSE14431 | Project -II | 3 | 3 | 3 | 2 | - | - | 2 | - | - | - | - | 3 | 3 | 2 | - | NA |
| **Average of CO-PO Mapping** | | **2.97** | **2.54** | **2.39** | **2.41** | **2.46** | **2.67** | **2.25** | **2.00** | **2.57** | **2.00** | **2.33** | **2.33** | **2.67** | **2.57** | **2.58** | **2.20** |  |