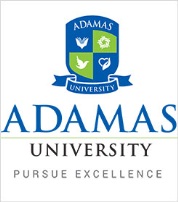
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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING**

**AND**

**TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE**

**AND**

**ENGINEERING**

**Master of Computer Application (MCA) Programme**

**(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: Master of Computer Application (MCA)**

**PROGRAMME EDUCATIONAL OBJECTIVES (PEO)**

**PEO 01:** Develop software solutions to problems across a broad range of application domains through analysis and design.

**PEO 02:** Contribute to research of their chosen field and function and communicate effectively, to perform both individually and in a multi-disciplinary team.

**PEO 03:**Continue the process of life-long learning through professional activities, adapt themselves with ease to new technologies, while exhibiting high ethical and professional standards.

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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: Master of Computer Application (MCA)**

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

**GA 01 / PO 01: Computational Knowledge:** Understand and apply mathematical foundation, computing and domain knowledge for the conceptualization of computing models from defined problems.

**GA 02 / PO 02: Problem Analysis**: Ability to identify, critically analyze and formulate complex computing problems using fundamentals of computer science and application domains.

**GA 03 / PO 03: Design / Development of Solutions**: Ability to transform complex business scenarios and contemporary issues into problems, investigate, understand and propose integrated solutions using emerging technologies

**GA 04 / PO 04: Conduct Investigations of Complex Computing Problems**: Ability to devise and conduct experiments, interpret data and provide well informed conclusions.

**GA 05 / PO 05: Modern Tool Usage:** Ability to select modern computing tools, skills and techniques necessary for innovative software solutions.

**GA 06 / PO 06: Professional Ethics**: Ability to apply and commit professional ethics and cyber regulations in a global economic environment.

**GA 07 / PO 07: Life-long Learning**: Recognize the need for and develop the ability to engage in continuous learning as a computing professional.

**GA 08 / PO 08: Project Management and Finance:** Ability to understand, management and computing principles with computing knowledge to manage projects in multidisciplinary environments.

**GA 09 / PO 09:Communication Efficacy:** Communicate effectively with the computing community as well as society by being able to comprehend effective documentations and presentations.

**GA 10 / PO 10: Societal & Environmental Concern:** Ability to recognize economic, environmental, social, health, legal, ethical issues involved in the use of computer technology and other consequential responsibilities relevant to professional practice.

**GA 11 / PO 11: Individual & Team Work:**Ability to work as a member or leader in diverse teams in multidisciplinary environment.

**GA 12 / PO 12: Innovation and Entrepreneurship:**Identify opportunities, entrepreneurship vision and use of innovative ideas to create value and wealth for the betterment of the individual and society.

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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: Master of Computer Application (MCA)**

**PROGRAMME SPECIFIC OUTCOME (PSO)**

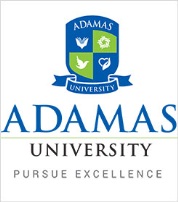
**PSO 01:** Globally expertise the technological planning and development of software applications in the usage of the modern era.

**PSO 02:** Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare.

**PSO 03:** Ability to enhance and develop techniques for independent and lifelong learning in computer application.

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**HOD DEAN / SCHOOL CONCERNED**

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING**

**AND**

**TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE**

**AND**

**ENGINEERING**

**Course Structure & Syllabus of**

**Master of Computer Application (MCA)**

**(W.e.f AY 2020 – 21)**

**SoET 2.0**

**(Engineering+)**

|  |  |  |  |  |  |  |  |  |
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| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **PG PROGRAM: Master of Computer Application (MCA)**  **SEMESTER I** | | | | | | | | |
| **Sl. No** | **Type of Course** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory |  | Computer Programming with Python | 3 | 0 | 0 | 3 | 3 |
| 2 | Theory |  | Numerical & Statistical Methods | 3 | 0 | 0 | 3 | 3 |
| 3 | Theory |  | Computer Organization & Architecture | 3 | 0 | 0 | 3 | 3 |
| 4 | Theory |  | Software Engineering | 3 | 0 | 0 | 3 | 3 |
| 5 | Theory |  | HSSM– I (English Communication) | 3 | 0 | 0 | 3 | 2 |
| 6 | Theory |  | Data Structures with Python | 3 | 0 | 0 | 3 | 3 |
| 7 | Practical |  | Computer Programming with Python Lab. | 0 | 0 | 3 | 3 | 2 |
| 8 | Practical |  | Numerical & Statistical MethodsLab. | 0 | 0 | 3 | 3 | 2 |
| 9 | Practical |  | Computer Organization & Architecture Lab. | 0 | 0 | 3 | 3 | 2 |
| 10 | Practical |  | Data Structures with Python Lab | 0 | 0 | 3 | 3 | 2 |
| **Total** | | | | **18** | **0** | **12** | **30** | **25** |

|  |  |  |  |  |  |  |  |  |
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| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **PG PROGRAM: Master of Computer Application (MCA)**  **SEMESTER II** | | | | | | | | |
| **Sl. No** | **Type of Course** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory |  | Mobile Applications using Android/IoS | 3 | 0 | 0 | 3 | 3 |
| 2 | Theory |  | Object Oriented Programming with Java | 3 | 0 | 0 | 3 | 3 |
| 3 | Theory |  | Operating System | 3 | 0 | 0 | 3 | 3 |
| 4 | Theory |  | Database Management System | 3 | 0 | 0 | 3 | 3 |
| 5 | Theory |  | Discrete Mathematics | 3 | 0 | 0 | 3 | 3 |
| 6 | Practical |  | Mobile Applications using Android/IoS Lab | 0 | 0 | 3 | 3 | 2 |
| 7 | Practical |  | Object Oriented Programming with Java Lab | 0 | 0 | 3 | 3 | 2 |
| 8 | Practical |  | Operating SystemLab | 0 | 0 | 3 | 3 | 2 |
| 9 | Practical |  | Database Management System Lab | 0 | 0 | 3 | 3 | 2 |
| **Total** | | | | **15** | **0** | **12** | **27** | **23** |

**Total Credits (First Year): 48**

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| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **PG PROGRAM: Master of Computer Application (MCA)**  **SEMESTER III** | | | | | | | | |
| **Sl. No** | **Type of Course** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory |  | Web Technology | 3 | 0 | 0 | 3 | 3 |
| 2 | Theory |  | Data Communication & Computer Network | 3 | 0 | 0 | 3 | 3 |
| 3 | Theory |  | Cyber Security | 3 | 0 | 0 | 3 | 3 |
| 4 | Theory |  | HSS –III (English Communication) | 3 | 0 | 0 | 3 | 2 |
| 5 | Theory |  | Elective Course – I | 3 | 0 | 0 | 3 | 3 |
| 6 | Theory |  | Elective Course – II | 3 | 0 | 0 | 3 | 3 |
| 7 | Practical |  | Web Technology Lab | 0 | 0 | 3 | 3 | 2 |
| 8 | Practical |  | Cyber Security Lab | 0 | 0 | 3 | 3 | 2 |
| 9 | Practical |  | Elective Course – I Lab | 0 | 0 | 3 | 3 | 2 |
| 10 | Project |  | Project -I | 0 | 0 | 3 | 3 | 2 |
| **Total** | | | | **18** | **0** | **12** | **30** | **25** |

**From a list of departmental electives:**

**Elective Course – I**

1. Artificial Intelligence and Machine Learning (ECS52145)

2. Fundamentals of Cloud Computing (ECS52153)

**Elective Course – II**

1. Natural Language Processing and Its Application (ECS52147)

2. Cloud Storage (ECS52155)

3. Data Warehousing & Data Analytics (ECS51150)

**Elective Course – I Lab**

1. Artificial Intelligence and Machine Learning Lab using Tensor flow (ECS52245)

2. Fundamentals of Cloud Computing Lab (ECS52253)

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| **ADAMAS UNIVERSITY**  **SCHOOL OF ENGINEERING & TECHNOLOGY**  **PG PROGRAM: Master of Computer Application (MCA)**  **SEMESTER IV** | | | | | | | | |
| **Sl. No** | **Type of Course** | **Course Code** | **Course Title** | **L** | **T** | **P** | **Contact**  **Hrs./Wk.** | **Credits** |
| 1 | Theory |  | Elective Course – III | 3 | 0 | 0 | 3 | 3 |
| 2 | Theory | HPS44101 | HSS-VI (Basics of Organizational Behaviors) | 3 | 0 | 0 | 3 | 3 |
| 3 | Theory | MBA52180 | Project Management | 3 | 0 | 0 | 3 | 3 |
| 4 | Practical |  | Elective Course – III Lab | 0 | 0 | 3 | 3 | 2 |
| 5 | Seminar | ECS52342 | Seminar | 0 | 2 | 0 | 2 | 2 |
| 6 | Project | ECS52442 | Project -II | 0 | 0 | 6 | 6 | 4 |
| **Total** | | | | **9** | **2** | **9** | **20** | **17** |

**From a list of departmental electives:**

**Elective Course – III**

1. Game Design (ECS52157)
2. Public Blockchain- Ethereum (ECS52142)

**Elective Course – III Lab**

1. Game Design Lab using CONSTRUCT (ECS52257)
2. Public Blockchain- Ethereum Lab (ECS52242)

**Total Credits (Second Year): 42**

**Total Credits (over two years): 48+42 = 90**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ECS51141** | Computer Programming with Python | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basic Computer Skills** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To **provide** an introduction to the Python programming language.
* To **introduce** students with an introduction to programming, I/O, and visualization using the Python programming language.
* 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: 07 lecture hours**

Anatomy of a Python project: basic syntax and structure of a Python program; Introduction: History of Python, compiler, interpreter, source code; How a basic mathematical problem be solved using Python – Variables, Constant, Basic operators, Commenting, Basic Input/output statement, and Data Types; Different Python programming IDE; Various string operations; Basic Build-In Functions; Various formats of print() and input() built-in functions; python packages

**Unit II: 12 lecture hours**

Student’s grading system: Control Flow and Syntax: The if Statement, The else statement, indentation; Operators: Relational, Logical, Bit Wise Operators, examples programs; The while Loop, break and continue, The for Loop, Lists, Tuples, Sets, Dictionaries, Sorting Dictionaries, Copying Collections, example programs; Finding and Fixing Problems: Types of Errors, Troubleshooting Tools, Using the Python Debugger

Numerical Python: N-Darray, Indexing and Slicing, Broadcasting, Mathematical Functions, Byte Swapping, Linear Algebra using NumPy.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 Modules: Introduction, defining of user’s function, Parameters, Keyword and Optional Parameters, Passing Collections to a Function, Variable Number of Arguments, Scope of a Functions - "First Class Citizens"; Passing Functions to a Function; Mapping Functions in a Dictionary; Lambda functions; Modules: Standard Modules – sys, math; Standard Modules. **Project:** A tiny project has to complete within 7 days.

**Unit IV: 9 lecture hours**

Object Oriented Concept: Example of Student Management System: Classes in Python, Principles of Object Orientation, Creating Classes, Instance Methods, Class Variables, Inheritance, Polymorphism, Type Identification, Custom Exception Classes

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

**Unit V: 07 lecture hours**

Graphical User-Interface: Tkinter: A “Window example”; Tkinter Widgets; Standard attributes; Geometry Management

Python Data Processing: Pandas: CSV, JSON, XLS Data; Series, DataFrames; Data Wrangling; Data Aggregation

Python Data Visualization: Matplotlib: Line, Box, Scatter plots; Charts; Bubble, 3D; Heat Maps generation

**Text Books:**

1. “Core Python Programming”, Second Edition, R. Nageswara Rao, dreamtech.
2. “Introducing Python”, 3rd Edition, Lubanovic Bill, O’Reilly

**Reference Books:**

1. “Effective Python: 59 Specific Ways to Write Better Python”, 1st Edition, Brett Slatkin, Pearson

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

**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, PSO3** |
| **CO2** | **Demonstrate** the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples, sets and strings. | **PO1, PO2, PO3, PO12, PSO3** |
| **CO3** | **Develop** proficiency in the handling of functions. | **PO1, PO2, PO3, PO4, PO11, PO12, PSO3** |
| **CO4** | **Identify** the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python. | **PO1, PO2, PO3, PO12, PO5, PSO3** |
| **CO5** | **Find** the commonly used operations to handle run time error or Exception | **PO1, PO2, PO3, PO4, PO5, PO12, PSO3** |
| **CO6** | **Summarize** how to handle large data file with the help of various file handling methods. | **PO1, PO2, PO4, PO12, PSO3** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS51141 | Computer Programming with Python | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | 1 | 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: MCA Semester: I Stream: CSE

PAPER TITLE: COMPUTER PROGRAMMING WITH PYTHON

PAPER CODE: ECS51141

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. | **Describe** the Identifiers, Keywords and Variables in Python programming language with examples. | **U** | **CO1** |
| 2. | **Explain** the basic data types available in Python with examples. | **Evaluate** | **CO1** |
| ­­­ 3. | **Describe** the difference between set and list datatype. | **U** | **CO1** |
| 4. | **Explain** how slicing operator used on string datatype. | **Evaluate** | **CO2** |
| 5. | **Describe** why strings are immutable with an example. | **U** | **CO2** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Write** Python program to find the GCD of two positive numbers. | **Ap** | **CO1** |
| 7. | **Examine** whether the given string is a Palindrome or not using slicing. | **Ap** | **CO2** |
| 8. | **Describe** the various file opening mode in Python language. | **U** | **CO6** |
| 9. | **Describe** with Example: i) try catch block ii) function calling | **U** | **CO3, CO5** |
|  | **SECTION C (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Write** 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. **Write** Python program to Check Whether the Area of the First Rectangle is Greater than Second by Overloading > Operator. | **Ap** | **CO4** |
| 12. | **Describe** the advantage of functions in Python. **Describe** the scope and lifetimes of Global & Local variables. | **U** | **CO3** |

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| **SMA51141** | Numerical & Statistical Methods | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hour - 45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basic math Skills** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

To provide students with knowledge in different computational errors occurred in numerical calculation which can be minimized using different numerical techniques and, analyse and interpret statistical data using several statistical tools.

**Course Outcomes:**

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

1. **Find** skewness, kurtosis, correlation coefficient and fit linear curve with the available set of

data.

1. **Explain** Baye’s theorem for certainty of events and several probability distributions.
2. **Apply**test of hypothesis to test mean, variance and different attributes for a population.
3. **Find** real roots of algebraic and transcendental equations using Bisection method, Regula-Falsi

method and Newton Raphson method.

1. **Utilize** Euler method, Runge-Kutta method to obtain the solution to ordinary differential

equations with initial conditions and, direct and iterative methods in simultaneous linear

equation.

1. **Explain** Numerical integration to obtain the value of an integral with finite limit and, finite

differences to obtain interpolating and extrapolation values.

**Catalog Description:**

This course introduces basic concepts in programming language to solve numerical and statistical 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 coordinator.

**Course Content:**

**Module 1: 10 lecture hours**

**Statistics:** Definition, scope and limitation, presentation of data, diagrammatic and graphical representation of data, measures of central tendency, mean, median and mode, geometric and harmonic mean and their limitations, Measure of variations, Range, Quartile, Variance, Standard deviation, Skegness, moment and Kurtosis.

**Correlation and Regression:**

Introduction to Correlation analysis, Karl Pearson correlation coefficient, Rank Correlation,

Regression Analysis, Fitting Straight Lines, Method of least square, regression coefficients, properties

of regression coefficients and applications.

**Module 2: 15 lecture hours**

**Probability:** Introduction, Probability of an event, additive rule & multiplication rule, conditional probability Bayes’ rule and applications.

**Probability Distributions:** Random variable, discrete and continuous probability distribution, Mathematical expectation, Variance of a random variable, Binomial, Hyper-geometric, Poisson distribution, Uniform, Normal, Exponential Distribution.

**Test of hypothesis:** Introduction, null hypothesis and alternative hypothesis, type I and type II errors,

one and two tailed tests, test on a single mean when variance is known

**Module 3: 8 lecture hours**

**Numerical solution of algebraic and transcendental equations:** Introduction, Concept of Errors, Bisection Method, False Position Method, Secant Method, Newton-Raphson Method, Successive Approximation Method, Discussion of Convergence,

**Solution of simultaneous linear equations:** Gauss elimination method, pivoting, ill conditioned

equations, Gauss Seidel and Gauss Jacobi iterative methods

**Module 4: 12 lecture hours**

**Finite difference analysis:** Interpolation and Extrapolation, Calculus of difference, Newton’s Forward Interpolation Formula and Backward Interpolation Formula, Lagrange’s method, Newton’s divided difference formula, Inverse Interpolation and its applications.

**Numerical differentiation and integration:** Differentiation formulae based on polynomial fit, integration by trapezoidal and Simpson’s one-third rules.

**Solution of simultaneous linear equations and ordinary differential equations:** Euler methods,

Modified Euler method, Runge-Kutta method.

**Text Books:**

1. S.C. Gupta and V K Kapoor; Fundamentals of Mathematical Statistics, S Chand & Sons

2. Veerarajan, T Ramachandran; Numerical Methods.

**Reference Books:**

1. Manish Goyal; Numerical methods and Statistical Techniques using ‘C’, Laxmi Publications pvt. Ltd.

2. S Dey and S Gupta; Numerical Methods ,Tata McGraw-Hill Education, 2013

3. B.S. Grewal; Numerical methods in engineering and science, 42 Edition, Khanna Publishers.

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Mid term** | **Attendance** | **Class Assessment** | **End Term** |
| **Weightage (%)** | **20** | **10** | **30** | **40** |

**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 Program Outcomes** |
| **CO1** | **Find** skewness, kurtosis, correlation coefficient and fit linear curve with the available set of data. | **PO1** |
| **CO2** | **Explain** Baye’s theorem for certainty of events and several probability distributions. | **PO1, PSO3** |
| **CO3** | **Apply** test of hypothesis to test mean, variance and different attributes for a population. | **PO1, PO4, PSO3** |
| **CO4** | **Find** real roots of algebraic and transcendental equations using Bisection method, Regula-Falsi method and Newton Raphson method. | **PO1, PO2** |
| **CO5** | **Utilize** Euler method, Runge-Kutta method to obtain the solution to ordinary differential equations with initial conditions and, direct and iterative methods in simultaneous linear equation. | **PO1, PO2** |
| **CO6** | **Explain** Numerical integration to obtain the value of an integral with finite limit and, finite differences to obtain interpolating and extrapolation values. | **PO1, PO2** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| SMA  51141 | Numerical & Statistical Methods | 3 | 3 | - | 1 | - | - | - | - | - | - | - | - | - | - | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | |
| **Course: Numerical & Statistical Methods (SMA51141)**  **Program: MCA Time: 03 Hrs. Semester: I Max. Marks: 40**  **Instructions:**  Attempt all questions from **Section A** (each carrying 1 marks); **Section B** (each carrying 5 marks)**. Section C** (carrying 10 marks)**.** | | | |
| **Section A (** Answer all**)** | | | |
| 1. | **What** are normal equations in linear curve fitting? | **R** | **CO1** |
| 2. | **Define** Bay’s theorem. | **R** | **CO2** |
| ­­­3. | **What** is probability density function? | **R** | **CO2** |
| 4. | **Define** type I and type II error. | **R** | **CO3** |
| 5. | **What** is the range of the rank correlation coefficient? | **R** | **CO1** |
| **SECTION B (**Short answer type**)** | | | |
| 6. | **Find** a real root of the following equation x2-5x-7=0 that lies between 2 and 3 correct to 4 decimal places using Regula-Falsi method. | **R** | **CO4** |
| 7. | **Find** y (1.1) using Euler’s method given as = y2+xy , y(1)=1. h=0.1. | **R** | **CO5** |
| 8. | **Find** the integral value of by Simpson’s 1/3rd rule, taking 8 equal sub-intervals. Hence estimate the value of . | **R** | **CO6** |
|  | **SECTION C (Long answer type)** |  | |
| 9. | **Utilize** Gauss elimination method. | **Ap** | **CO5** |
| 10. | The following table gives the numbers of aircraft accidents that occurred during the various days of the week. **Identify** whether the accidents are uniformly distributed over the week. Given,   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | Day | Sun | Mon | Tue | Wed | Thu | Fri | Sat | Total | | No. of accidents | 14 | 16 | 8 | 12 | 11 | 9 | 14 | 84 | | **Ap** | **CO3** |

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| --- | --- | --- | --- | --- | --- |
| **ECS51143** | Computer Organization & Architecture | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basic computer Skills** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To study the basic organization and architecture of digital computers (CPU, memory, I/O, software).
* To Discussions will include digital logic and microprogramming. Such knowledge leads to better understanding and utilization of digital computers, and 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. **Analyse**the concepts of memory utilization in a computer system.

CO5**. Define** the implementation of parallel processors and Analyse 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: 12lecture 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: 10lecture 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 hour s 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** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

**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,PSO3** |
| **CO3** | **Illustrate** pipelined execution, parallel processing and principles of scalable performances. | **PO1,PO3,PO6,PO12,PSO1,PSO3,PSO2** |
| **CO4** | **Analyse** the concepts of memory utilization in a computer system | **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,PSO3** |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS 51143 | Computer Organization & Architecture | 3 | 1 | 3 | - | 2 | 3 | - | - | - | - | - | 3 | 3 | 1 | 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: M.C.A Semester: I**  **Code- ECS51143 Stream- CSE Time: 03 Hrs.**  **Paper title– Computer Organization & Architecture Total pages- 2**  **Max. Marks: 40 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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| **ECS51145** | 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:**

* To help the student to acquire knowledge of software evolution process.
* To enable students modelling software project with appropriate metric and precision at workplace.
* 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.
* 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](http://www.pace.edu/seidenberg/software-development-engineering-ms) professional program is Pace University’s response to the tremendous growth of the software development industry.

**Course Content:**

**Unit I: 9 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, 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** | **Attendance** | **Class Assessment** | **Mid Term** | **End Term** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understand t**he impact of software engineering. | **PO1, PO11,PO7,PO10** |
| **CO2** | **Communicate** with proper software model paradigm to pupils. | **PO1, PO2, PO3, PO4, PO5, PO11, PSO1, PSO2** |
| **CO3** | **Enhancemen**t of software metric engineering application in industry. | **PO1, PO5, PO12, PSO2** |
| **CO4** | **Compare** Effectively testing and maintenance of software project | **PO1, PO6, PO8, PO9, PO12, PSO3** |
| **CO5** | **Classify** software metric analysis for an effective model . | **PO1, PO6, PO8, PO9, PO12, PSO2** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO  10 | PO  11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  51145 | Software Engineering | 3 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 3 | 1 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

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

PAPER TITLE: Software Engineering PAPER CODE: ECS51145

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. | **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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| **HEN51129** | HSS-I(English Communication) | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour -30** | **3** | **0** | **0** | **2** |
| **Pre-requisites/Exposure** | **English grammar knowledge at basic level** | | | | |
| **Co-requisites** | **--** | | | | |

|  |  |
| --- | --- |
| **No** | **Course Objectives:** |
| **1** | Introducing the concept of communication and imaginative thinking. |
| **2** | Acquainting the students with the newest techniques and formats of different types of communication. |
| **3** | Enhancing the potential of the students. |
| **4** | Enabling the students to stimulate their thinking and enhance  their presentational skills. |

**Course Outcomes:**

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

CO1. **Develop** the various elements of communicative skills

CO2. **Categorize** different theories of communication

CO3. **Relate** the role of the society in the development of language

CO4. **Evaluate** spaces of communication to understand the nuances of speech and writing

CO5. **Maximize** imaginative thinking to express ideas.

**CatalogDescription:**

English Communication course aims at empowering students with the power of Language by helping them develop the skills of presentation and performance. At the same time an average student gains access to the basics of Grammar and the dynamics of language and message conveyance. Students are encouraged to think with imagination, write or speak with their own linguistic abilities and engage in further reading and conversational styles. They become better acquainted to deal with interviews and screening processes.

**Course Content:**

**Unit I**: **6 lecture hours**

Introduction, relevance of English language, different theories of Communication.

**Unit II**: **6 lecture hours**

Grammar, Syntax, basic components, Tense, Prepositions and other parts of speech.

**Unit III:** **6 lecture hours**

Reading and listening skills

**Unit IV:** **6 lecture hours**

Speaking and presentational skills.

**Unit V**: **6 lecture hours**

Writing skills, letters, Essays and other documents of writing.

**Text books:**

1. Fluency in English - Part II, Oxford University Press, 2006.
2. Business English, Pearson, 2008.
3. Strunk Jr, William and White, E.B; The Elements of Style; 4th Edition; Longman; 1999
4. Language, Literature and Creativity, Orient Blackswan, 2013
5. Language through Literature (forthcoming) ed. Dr. Gauri Mishra, Dr Ranjana Kaul, Dr Brati Biswas
6. Wren, P.C. and H. Martin. High School Grammar and Composition. New Delhi: S Chand, 2017

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Mid Term** | **Attendance** | **Class Assessment** | **End Term** |
| **Weightage (%)** | **20** | **10** | **30** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Develop** the various elements of communicative skills | **PO1, PO5** |
| **CO2** | **Categorize** different theories of communication | **PO1,PO2** |
| **CO3** | **Relate** the role of the society in the development of language | **PO1, PO2, PO3, PO5, PO7** |
| **CO4** | **Evaluate** spaces of communication to understand the nuances of speech and writing | **PO1, PO2, PO3** |
| **CO5** | **Maximize** imaginative thinking to express ideas. | **PO1, PO3,PO4, PO8, PO12** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| HEN  51129 | HSS I (ENGLISH COMMUNICATION) | 3 | 3 | 3 | 1 | 2 | - | 1 | 1 | - | - | - | 1 | - | - | - |

1=weakly mapped

2= moderately mapped

3=strongly mapped

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | | |
| **END-SEMESTER EXAMINATION: DECEMBER 2019**  **(Academic Session: 2019 – 20, Semester: Aug. 2019 – Dec. 2019)**  **SCHOOL OF ENGINEERING AND TECHNOLOGY**  **Name of the Program: M.C.A. Semester: I**  **Paper Title: HSS -I (ENGLISH COMMUNICATION) Paper Code: HEN51129**  **Maximum Marks: 40 Time duration: 3 hours**  **Total No of questions: 10 Total No of Pages: 1** | | | | |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | | |
| 1. | **Define** Communication Skills. **Narrate** an incident where lack of proper Communication skills end in a hilarious situation. | | **R & U** | **CO1** |
| 2. | **Evaluate** any 4 hurdles to successful Communication. | | **U** | **CO5** |
| ­­­ 3. | **Write** a job application to an organization/ company of your choice stating your eligibility conditions. | | **U** | **CO4** |
| 4. | **Write** a report as a journalist of a monthly magazine on an incident of female foeticide that you have witnessed in a remote village in Haryana. | | **U** | **CO3** |
| 5. | **Write** a paragraph in not more than 450 words about your experience in a favorite holiday destination. | | **U** | **CO4** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** | |  | |
| 6. | **Write** a short note on Inter-personal and intra-personal Communication by pointing out the differences between them. | | **Ap** | **CO5** |
| 7. | **What** are the linguistic barriers in Communication? Discuss this in brief. | | **U & R** | **CO1** |
| 8. | **Write** down the two major characteristics of Verbal Communication with examples. | | **Ap & R** | **CO2** |
| 9. | **Illustrate**the stages of Communication with a suitable image. | | **U** | **CO3** |
|  | **SECTION C (Answer Any Two Questions) (2 x 10 = 20)** | |  | |
| 10. | **What** are the major components of a message transference? Illustrate with an image. | | **R & U** | **CO4** |
| 11. | **Explain** 5 major hurdles to Virtual Communication. | | **U** | **CO5** |
| 12. | **Explain** how Noise and Attitude serves as barriers to effective communication. | | **U** | **CO2** |

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| **ECS51147** | Data Structures with Python | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hour -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basic Computer Skills** | | | | |
| **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

CO1. **Define** the concept of Dynamic memory management, data types, and algorithms.

CO2**. Illustrate**advantages and disadvantages of specific algorithms and data structures.

CO3**. Solve** bugs in program, recognize needed basic operations with data structures.

CO4**. Interpret** algorithms and data structures in terms of time and memory complexity of

basic operations.

CO5**. 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: 06 lecture hours**

**Review:** Array – List – Dictionaries – Sets – OOP concepts in Python.

**Maps:** Create; Reorder; Update

**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: 10 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: 10 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: 10 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.
3. Tamassia, R., Goodrich, M. T., Goldwasser, M. H. (2013). Data Structures and Algorithms in Python. United States: John Wiley & Sons, Incorporated
4. Ranum, D. L., Miller, B. N. (2011). Problem Solving with Algorithms and Data Structures Using Python. United States: Franklin, Beedle & Associates.
5. Baka, B. (2017). Python Data Structures and Algorithms. United Kingdom: Packt Publishing.
6. Lambert, K. (2014). Fundamentals of Python: Data Structures. United States: Cengage Learning.

**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
3. Velte T., Velte A., Elsenpeter R., “Cloud Computing – A practical Approach”, Tata

McGrawHill

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

**Examination Scheme:**

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| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

**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** | **Define**concept of Dynamic memory management, data types, and algorithms. | **PO1, PSO1** |
| **CO2** | **Illustrate**advantages and disadvantages of specific algorithms and data structures. | **PO1, PO2, PSO1** |
| **CO3** | **Solve**bugs in program, recognize needed basic operations with data structures. | **PO1, PO2, PSO1** |
| **CO4** | **Interpret**algorithms and data structures in terms of time and memory complexity of basic operations. | **PO1, PO3, PO2, PSO1** |
| **CO5** | **Construct**the computational efficiency of the principal algorithms for sorting, searching, and hashing. | **PO1, PO3, PO12, PSO3** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  51147 | Data Structures with Python | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 1 | 3 | - | 1 |

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: MCA Semester: I Stream: CSE

PAPER TITLE: Data structures With Python PAPER CODE: ECS51147

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.

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| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **Describe** the Identifiers, Keywords and Variables in Python programming language with examples. | **U** | **CO1** |
| 2. | **Explain** the basic data types available in Python with examples. | **Evaluate** | **CO1** |
| ­­­ 3. | **Describe** the difference between set and list datatype. | **U** | **CO1** |
| 4. | **Explain** how slicing operator used on string datatype. | **Evaluate** | **CO2** |
| 5. | **Describe** why strings are immutable with an example. | **U** | **CO2** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Write** Python program to find the GCD of two positive numbers. | **Ap** | **CO1** |
| 7. | **Examine** whether the given string is a Palindrome or not using slicing. | **Ap** | **CO2** |
| 8. | **Describe** the various file opening mode in Python language. | **U** | **CO6** |
| 9. | **Describe** with Example: i) try catch block ii) function calling | **U** | **CO3, CO5** |
|  | **SECTION C (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Write** 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. **Write** Python program to Check Whether the Area of the First Rectangle is Greater than Second by Overloading > Operator. | **Ap** | **CO4** |
| 12. | **Describe** the advantage of functions in Python. **Describe** the scope and lifetimes of Global & Local variables. | **U** | **CO3** |

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| **ECS51241** | Computer Programming with Python 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:**

* To **acquire** programming skills in core Python.
* To **acquire** Object Oriented Skills in Python
* To **develop** the skill of designing Graphical user Interfaces in Python
* 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. **Inspect**Conditionals structure Loops and various operators used in Python Programs

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

Dictionaries

CO4 **Analyse** 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:**

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| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

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| **Course Outcomes (COs)** | | **Mapped POs and PSOs** |
| **CO1** | **Classify** how to Write, Test and Debug Python Programs | **PO2, PO3, PSO3** |
| **CO2** | **Inspect**Conditionals structure Loops and various operators used in Python Programs | **PO2, PO3, PSO3** |
| **CO3** | **Experiment with** functions and **demonstrate** compound data using Lists, Tuples and Dictionaries | **PO1, PO2, PO3, PSO3** |
| **CO4** | **Analyze** how Read and write data from & to files in Python. | **PO1, PO2, PO3, PSO3** |
| **CO 5** | **Explain** and **develop** the concept of OOP in Python. | **PO1, PO2, PO3, PSO3** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS51241 | Computer Programming with Python Lab | 2 | 3 | 3 | - | - | - | - | - | - | - | - | - | - | - | 3 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

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**Model Question Paper**

**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

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

PAPER TITLE: Computer Programming with Python Lab PAPER CODE: ECS51241

Maximum Marks: 40 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 8 = 40)** | | | |
| 1. | Write a program to purposefully to **Inspect** Indentation Error and Correct it. | **Analyze** | **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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| **SMA51241** | Numerical & Statistical Methods Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hour -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Basic math Skills** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

To provide students with computing knowledge in Numerical and Statistical problems using programming language.

**Course Outcomes:**

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

CO1**. Find** real roots of algebraic and transcendental equations using Bisection method, Regula-Falsi method and Newton Raphson method.

CO2.**Solve** system of linear equations using direct method and iteration method.

CO3**. Illustrate** several methods of finite differences to obtain interpolating and extrapolating values from a set of data using.

CO4**. Classify** Trapezoidal rule and Simpson’s 1/3rd rule to obtain the value of an integral with finite limit.

CO5**. Utilize** Euler method, Runge-Kutta to obtain the solution to ordinary differential equations with initial conditions.

CO6**. Find** mean, variance, correlation coefficient and fit linear curve with the available set of data.

**Course Description:**

This course introduces basic concepts in programming language to solve numerical and statistical 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 coordinator.

**Course Content:**

List of experiments

Write and execute C-code for the following programs:

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| --- | --- |
| Sl. No. | Name of the experiment |
| 1 | To find real roots of algebraic and transcendental equations using Bisection method. |
| 2 | To find real roots of algebraic and transcendental equations using Regula-Falsi method. |
| 3 | To find real roots of algebraic and transcendental equations using Newton Raphson method. |
| 4 | To find solution of system of simultaneous algebraic equations using Gauss elimination method. |
| 5 | To find solution of system of simultaneous algebraic equations using Gauss-Seidal iterative method. |
| 6 | To find interpolating values using Newton’s Forward interpolation formula. |
| 7 | To find interpolating values using Newton’s Backward interpolation formula. |
| 8 | To find interpolating values using Lagrange’s interpolation formula. |
| 9 | To evaluate integral value of a given function using Trapezoidal rule for numerical integration |
| 10 | To evaluate integral value of a given function using Simpson’s 1/3rd rule for numerical integration |
| 11 | To find numerical Solution of ordinary differential equation using Euler’s method. |
| 12 | To find numerical Solution of ordinary differential equation using 4th order Runge-Kutta method. |
| 13 | To calculate mean and variance from a statistical data set. |
| 14 | To calculate Correlation coefficient. |
| 15 | To fit a linear curve using available data set. |

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

**Examination Scheme:**

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| **Components** | **Mid term** | **Attendance** | **Class Assessment** | **End Term** |
| **Weightage (%)** | **20** | **10** | **30** | **40** |

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

**Mapping between COs, POs and PSOs**

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| **Course Outcomes (COs)** | | **Mapped POs , PSOs** |
| **CO1** | **Find** real roots of algebraic and transcendental equations using Bisection method, Regula-Falsi method and Newton Raphson method. | **PO1, PSO3** |
| **CO2** | **Solve** system of linear equations using direct method and iteration method. | **PO1, PSO3** |
| **CO3** | **Illustrate** several methods of finite differences to obtain interpolating and extrapolating values from a set of data using. | **PO1, PSO3** |
| **CO4** | **Classify** Trapezoidal rule and Simpson’s 1/3rd rule to obtain the value of an integral with finite limit. | **PO1, PSO3** |
| **CO5** | **Utilize** Euler method, Runge-Kutta to obtain the solution to ordinary differential equations with initial conditions. | **PO1, PSO3** |
| **CO6** | **Find** mean, variance, correlation coefficient and fit linear curve with the available set of data. | **PO1, PSO3** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| SMA  51241 | Numerical & Statistical Methods Lab | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | 3 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Question Paper**

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| **Name:**  **Enrolment No:** | |  |
| **Course Name: Numerical & Statistical Methods Lab Course Code: SMA51241**  **Program: MCA Time: 03 Hrs. Semester: I Max. Marks: 40** | | |
| **Answer any four Question (4 X 10 = 40)** | | |
| 1 | **Find** real roots of algebraic and transcendental equations using Bisection method. | **R** |
| 2 | **Find** real roots of algebraic and transcendental equations using Regula-Falsi method. | **R** |
| 3 | **Find** real roots of algebraic and transcendental equations using Newton Raphson method. | **R** |
| 4 | **Find** solution of system of simultaneous algebraic equations using Gauss elimination method. | **AP** |
| 5 | **Find** solution of system of simultaneous algebraic equations using Gauss-Seidal iterative method. | **AP** |
| 6 | **Find** interpolating values using Newton’s Forward interpolation formula. | **U** |
| 7 | **Find** interpolating values using Newton’s Backward interpolation formula. | **U** |
| 8 | **Find** interpolating values using Lagrange’s interpolation formula. | **U** |

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| **ECS51243** | **Computer Organization & Architecture Lab** | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours - 45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Basic concept of programming/Microprocessor** | | | | |

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| **Co-requisites** | -- |

**Course Objectives:**

To study the basic organization and architecture of digital computers (CPU, memory, I/O, software). Discussions will include digital logic and microprogramming. Such knowledge leads to better understanding and utilization of digital computers, and 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 modelling)
3. Implementation based on Half subtractor and Full subtractor (using data flow, behavioral, structural modelling)
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 modelling)
8. Implementation based on 4 Bit Comparator (using Behavioral modelling)
9. Implementation based on 4 Bit ALU

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

**Examination Scheme:**

|  |  |  |  |  |  |
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| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** | **Total** |
| **Weightage (%)** | **10** | **30** | **20** | **40** | **100** |

**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** | **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 computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS 51243 | Computer Organization & Architecture Lab | 2 | - | 2 | - | 2 | - | - | - | - | - | - | 2 | 2 | 2 | - |

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: MCA Semester: I**  **Code- ECS51243 Stream- CSE Time: 03 Hrs.**  **Paper title– Computer Organization & Architecture 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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| **ECS51247** | **Data Structures with Python 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 python 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 python 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 python 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 python 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 python 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 python program to insert, delete and display operation of a linear queue by using singly linked list.
8. Write a menu based python program to insert, delete and display operation of a linear queue by using an array.
9. Write a menu based python program to implement push, pop and display operation of a linear queue by using singly linked list.
10. Write a menu based python program to implement push, pop and display operation of a linear queue by using an array.
11. Write a menu based python program to implement insert, delete and display operation of a circular queue by using an array.
12. Write a menu based python program to implement insert, delete and traverse operation of a binary search tree using doubly linked list.
13. Write a menu based python program to implement linear search, binary search and interpolation search algorithm.
14. Write a menu based python 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 python.

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

**Examination Scheme:**

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| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

**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** | **Explain** asymptotic performance of the algorithms. | **PO1, PO2, PSO2, PSO3** |
| **CO2** | **Illustrate** Linear data structures and their applications such as Stacks, Queues and Lists | **PO1, PO2, PO3, PO4, PSO1, PSO2, PSO3** |
| **CO3** | **Solve** and understand Non-Linear Data Structures and their Applications such as Trees and Graphs | **PO1, PO2, PO3, PO4, PSO1, PSO2, PSO3** |
| **CO4** | **Interpret** searching and sorting algorithms. | **PO1, PO2, PO3, PSO1, PSO2, PSO3** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  51247 | Data Structures with Python Lab | 3 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 3 | 3 | 3 |

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

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

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

PAPER TITLE: Data Structures with Python Lab PAPER CODE: ECS51247

Maximum Marks: 40 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 8 = 40)** | | | |
| 1. | **Develop** a python program to reverse a singly linked list. | **Ap** | **CO1** |
| 2. | **Develop** a python program to insert an element in a circular queue by using an array. | **Ap** | **CO1** |
| ­­­ 3. | **Develop** a python program to delete a node from a doubly linked list. | **Ap** | **CO3** |
| 4. | **Develop** a python program to insert an element in a stack by using a singly linked list. | **Ap** | **CO1** |
| 5. | **Develop** a python program to insert a node at the end of a doubly linked list. | **Ap** | **CO4** |

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| **ECS51142** | **Mobile application using Android/IoS** | **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 students familiar with client server architecture.
* To develop a web application using java technologies
* To develop skills and project-based experience needed for entry into web application and development’s careers.

**Course Outcomes:**

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

CO1**. Produce** apps for iOS platform devices (iPhone/iPad/iPod Touch)

CO2.**Develop** a working knowledge of Apple’s Xcode app development tool

CO3.**Identify** need and opportunity in app markets

**Catalog Description:**

Although they have only become widely used in the past few years, mobile devices have already had a tremendous impact on our culture and its social dynamics. Recent rapid growth in the mobile device market has not been primarily driven by voice communications, but rather by the limitless ways in which these devices may be used to explore our local environments. These new communicative modes are expressed through small and self-contained “apps” that are focused around a central concept, and that leverage many of the advanced features of these devices to augment a user’s understanding of her environment. This course operates in two distinct but related modes: development, wherein an app is made functional; and design, through which an app is made usable. Students will be expected to consider both modes when producing their apps. Students will work throughout the semester to produce a compelling app of interest to the UNC community

**Course Content:**

**Unit I 9 Lecture hours**

**Introduction to the Android Platform**: Android SDK, Android SDK versions and compatibility, Demonstration of Eclipse and Android Installation, Java Fundamentals on variables, operators, conditional and iterative execution, Building a simple Android application, Understanding Anatomy or structure of an Android Application, Android life cycle, Android Manifest file.

**Unit II 9 Lecture hours**

**Android Application Design Fundamentals:** Anatomy of an Android application, Android basic terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents, Android Manifest File and its common settings, Using Intent Filter, Securing Android apps by Applying Permissions.

**Unit III 9 Lecture hours**

**Android User Interface (UI) Design Fundamentals:** User Interface Screen elements, Designing User Interfaces with Layouts, Adding functionality to a UI, Adding Option and Context menu to a UI, Advanced UI applying Paging and Swiping, Creating notifications, Event handling, Styles and Themes, Drawing and Working with Animation and Graphics

**Unit IV 9 Lecture hours**

Testing Android applications, Testing tools in Android, Publishing Android application, Using Android preferences, Managing Application resources in a hierarchy, working with different types of resources.

**Unit V 9 Lecture hours**

**Using Common Android APIs**: Using Android Data and Storage APIs, Managing data using Sqlite, Sharing Data between Applications with Content Providers, Using Android Networking APIs, Using Android Web APIs, Using Android Telephony APIs, Deploying Android Application to the World.

**TEXT BOOKS:**

1. Lauren Darcey and Shane Conder, “Android Wireless Application Development”, Pearson Education

**REFERENCE BOOKS:**

1. Reto Meier, “Professional Android 2 Application Development”, Wiley India Pvt Ltd.

2. Mark L Murphy, “Beginning Android”, Wiley India Pvt Ltd

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

**Examination Scheme:**

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| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

**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** | **Produce** apps for iOS platform devices (iPhone/iPad/iPod Touch) | **PO2, PO1** |
| **CO2** | **Develop** a working knowledge of Apple’s Xcode app development tool | **PO2, PO3** |
| **CO3** | **Identify** need and opportunity in app markets | **PO5, PSO3** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS51142 | Mobile Applications using Android/IoS | 1 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | - | - | 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: MCA Semester: II Stream: CSE

PAPER TITLE: Mobile Applications using Android/IoS PAPER CODE: ECS51142

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.

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| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **Describe**basic architecture of mobile device. | **U** | **CO1** |
| 2. | **Explain** about Block Level and Inline Elements. | **Evaluate** | **CO1** |
| 3. | **Describe** Android application | **U** | **CO1** |
| 4. | **Explain** UI design process. | **Evaluate** | **CO2** |
| 5. | **Describe**Objects in Java. | **U** | **CO2** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Write**an android application that displays hello world. | **Ap** | **CO1** |
| 7. | **Examine**android publication process. | **Ap** | **CO2** |
| 8. | **Describe** Database Connection. | **U** | **CO3** |
| 9. | **Describe**Tomcat web server | **U** | **CO3** |
|  | **SECTION C (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Write** the steps of Compiling and Installing the Servlet | **Ap** | **CO2** |
| 11. | **Write** the steps Invoking the Servlet. | **Ap** | **CO1** |
| 12. | **Describe** about Lifecycle of a Servlet | **U** | **CO3** |

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| **ECS51144** | **Object Oriented Programming with Java** | **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:**

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

**CatalogDescription:**

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.

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

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and Pos** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Define** Abstraction in all forms and in a holistic way | **PO1, PSO1** |
| **CO2** | **Illustrate** object oriented modelling techniques like classes and Instances modelling techniques | **PO1, PO2, PO3, PSO1, PS03** |
| **CO3** | **Solve** programs using standard design patterns | **PO1, PO2, PO3, PSO1** |
| **CO4** | **Interpret**fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc. | **PO1, PO2, PSO1** |
| **CO5** | **Construct**programming solutions with exception handling and multi-threading concept | **PO1, PO2, PO3, PSO1, PSO3** |
| **CO6** | **Solve**GUI program with proper event handling techniques | **PO1, PO2, PO3, PSO1, PSO3** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  51144 | Object Oriented Programming with Java | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 3 | - | 3 |

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

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

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

PAPER TITLE: Object Oriented Programming with Java PAPER CODE: ECS51144

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.

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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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| **ECS51146** | 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:**

* To introduce the main components of an OS & their function.
* To develop the process management and scheduling.
* To provide various issues in Inter Process Communication (IPC) and the role of OS in IPC.
* To understand the concepts and implementation Memory management policies and virtual memory.
* 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.
* 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.

.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: 8 lecture hours**

**Introduction:**Basics: Definition, Generations, Types, OS Services, System Calls, OS Structure: Layered, Monolithic, Microkernel –Virtual Machine. UNIX And WINDOWS Case Study.

**Unit II: 9 lecture hours**

**Processes:** Definition, Process Relationship, Process States, , Process Control Block,Context Switching – Threads –Multithreads, Types And Benefits Of Threads

**Process Scheduling**: Definition, Objectives ,Types Of Schedulers ,Scheduling Criteria : CPU Utilization, Throughput, Turnaround Time, Waiting Time, Response Time (Definition Only) , Pre-Emptive And Non Pre-Emptive Scheduling, FCFS – SJF – RR , Multiprocessor Scheduling : Types , Performance Evaluation Of The Scheduling

**Unit III: 8 lecture hours**

**Inter-Process Communication:** Race Conditions, Critical Section, Mutual Exclusion, Hardware Solution, Strict Alternation , Peterson’s Solution, The Producer Consumer Problem, Semaphores, Event Counters, Monitors, Message Passing, Classical IPC Problems: Reader’s & Writer Problem, Dinning Philosopher Problem Etc, API call in IPC establishment.

Process Synchronization: Critical Section, Synchronization Hardware Technique, Semaphores, Problems of Synchronization, Monitors.

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

**Basic Memory Management:** Definition, Logical And Physical Address Map; Memory Allocation: Contiguous Memory Allocation – Fixed And Variable Partition – Internal And External Fragmentation, Compaction, Paging: – Hardware Support, Protection And Sharing – Disadvantages.

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**Unit IV: 4 lecture hours**

**Deadlocks:** Definition, Characteristics, Prevention, And Avoidance: Banker’s Algorithm, Detection And Recovery, Coffman condition of dead lock in real time application.

**Unit V: 7 lecture hours**

**Virtual Memory:** Basics – Hardware And Control Structures – Locality Of Reference, Page Fault , Working Set , Dirty Page/Dirty Bit – Demand Paging – Page Replacement Policies : Optimal (OPT) , First In First Out (FIFO), Second Chance (SC), Not Recently Used (NRU) And Least Recently Used (LRU)

**Unit VI: 9 lecture hours**

**Principles Of I/O Hardware:** I/O Devices, Device Controllers, Direct Memory Access.

**Principles Of I/O Software:** Interrupt Handlers, Device Drivers, Device Independent I/O Software, Secondary-Storage Structure: Disk Structure, Disk Scheduling Algorithm

**File Management:** File Concept, Access Methods, File Types, File Operation, Directory Structure, File System Structure, Allocation Methods (Contiguous, Linked, Indexed), Free-Space Management (Bit Vector, Linked List, Grouping), Directory Implementation (Linear List, Hash Table),Efficiency & Performance.

**Disk Management:** Disk Structure, Disk Scheduling (FCFS, SSTF, SCAN,C-SCAN) , Disk Reliability, Disk Formatting, Bootblock, Badblocks.

**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.

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

**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,PO3,PO5** |
| **CO2** | **Define**, restate, discuss, and explain the policies for scheduling, deadlocks, memory management, synchronization, system calls, and file systems. | **PO2,PO3,PO5** |
| **CO3** | **Evaluate** the requirement for process synchronization and coordination handled by operating system. | **PO2,PO3,PO5** |
| **CO4** | **Design** and construct the following OS components: System calls, Schedulers, Memory management systems, Virtual Memory and Paging systems | **PO1,PO3,PO4** |
| **CO5** | **Identify** use and evaluate the storage management policies with respect to different storage management technologies. | **PO4,PO5** |
| **CO6** | **Identify** the need to create the special purpose operating system. | **PO3,PO5** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  51146 | Operating System | 2 | 2 | 3 | 2 | 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: MCA Semester: IICode- ECS51146 Stream- CSETime: 03 Hrs.Paper title– Operating System Total pages- 2Max. Marks: 40 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\*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\*5=15** | |  | |
| 6. | **Explain** various states of a process with the help of a state transition diagram. | | **U** | **CO1** |
| 7. | **When** internal fragmentation occurs explain with an example. | | **R** | **CO2** |
| 8. | **Demonstrate** critical section Problem. Explain all the requirements of critical-section problem. | | **U** | **CO3** |
| 9. | **Why** “Message passing is time consuming as compared to shared memory”? | | **R** | **CO4 /CO5** |
|  | **SECTION C (**Attempt any **Two Questions)2\*10=20** | |  | |
| 10. | **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** |
| 11. | **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** |
| 12. | **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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| --- | --- | --- | --- | --- | --- |
| **ECS51148** | Database Management Systems | **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:**

* To understand the different issues involved in the design and implementation of a database system.
* To study the physical and logical database designs, database modelling, relational, hierarchical, and network models.
* To understand and use data manipulation language to query, update, and manage a database.
* To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency.
* To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modelling, designing, and implementing a DBMS.

**Course Outcomes:**

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

CO1. **Describe** the fundamental elements of relational database management systems.

CO2**. Define** the basic concepts of relational data model, entity-relationship model, relational

database design, relational algebra and SQL.

CO3**. Design** ER-models to represent simple database application scenarios.

CO4.**Build** Structured Query Language (SQL) and apply to query a database.

CO5**. Convert** the ER-model to relational tables, populate relational database

and formulate SQL queries on data.

**Catalog Description:**

This is an introductory course in database management systems (DBMS) and file management systems. The course will cover the role of data, files and databases in information systems, data modeling concepts, data definition and manipulation using SQL, issues in data management and the development and implementation of database applications. Students will work in the Lab on various assignments including prototyping and SQL, utilizing state of the art DBMS and CASE tools.

**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** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Describe** the fundamental elements of relational database management systems. | **PO1,PSO1** |
| **CO2** | **Define** the basic concepts of relational data model, entity-relationship model, relational database design, relational algebra and SQL. | **PO1,PO2,PO12** |
| **CO3** | **Design** ER-models to represent simple database application scenarios. | **PO2,PO5,PSO3** |
| **CO4** | **Build** Structured Query Language (SQL) and apply to query a database. | **PO1,PO4, PO7** |
| **CO5** | **Improve** the database design by normalization. | **PO1,PO3** |
| **CO6** | **Familiar** with basic database storage structures and access techniques: file and page organizations, indexing methods including B tree, and hashing. | **PO12,PO2, PSO3** |
| **CO7** | **Convert** the ER-model to relational tables, populate relational database and formulate SQL queries on data. | **PO2,PO12, PSO3** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  51148 | Database Management Systems | 3 | 3 | 1 | 1 | 1 | - | 1 | - | - | - | - | 2 | 1 | - | 3 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

Name of the Program: MCA,Semester: II Stream: CSE

PAPER TITLE: Database Management Systems PAPER CODE: ECS51148

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. | **Explain** the Insertion anomalies with proper example? | **U** | **CO1** |
| 2. | **Define** is FD with example? | **R** | **CO5** |
| ­­­ 3. | **Explain** Super key and Candidate Key with proper example? | **U** | **CO4** |
| 4. | **Explain** Multivalued attribute with proper example? | **U** | **CO3** |
| 5. | **Explain** Strong entity with proper example? | **U** | **CO3** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Define** the Relational Algebra Fundemental operator with proper example? | **R** | **CO1** |
| 7. | **What are the** different type of JOINS with proper example? | **R** | **CO1** |
| 8. | **Describe** Armstrong's Axioms with example? | **U** | **CO1** |
| 9. | Suppose you are given the following requirements for a simple database for the   * National Hockey League (NHL): * the NHL has many teams, * each team has a name, a city, a coach, a captain, and a set of players, * each player belongs to only one team, * each player has a name, a position (such as left wing or goalie), a skill level, and * a set of injury records, * a team captain is also a player, * a game is played between two teams (referred to as host\_team and guest\_team)   and has a date (such as April 15th, 2018) and a score (such as 5 to 3).  **Develop** a clean and concise ER diagram for the NHL database. | **AP** | **CO2** |
|  | **SECTION (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, F ) with FDs are ABC → D, D → EF, A → BC  ii) R2 ( J, K, L, M, N, O, P ) with FDs are JN → KL, LM → K, NO→ P  b) **Explain** ACID Properties with proper example. 5+5 | **R**  **U** | **CO5,CO4** |
| 11. | i). Consider the following schema:  Book(acc no, yr\_pub, title)  User(card no, bname, baddress,dob,phno)  Borrow(acc no, doi, card\_ no)  Supp(S\_name,S\_add,S\_Phone)  where acc\_ no is accession number, yr\_pub is year of publication, bname is borrower name, baddress is borrower address, doi is date of issue, dob is the date of birth for the users, phno is the phone number of the user,S\_name is the supplier name, S\_add is the supplier address and S\_Phone is the supplier phone number. **Build** the following queries on the table. (In SQL)  (a) Find the Users who are 30 years and above.  (b) Display the title of the book which Starts with “D”  (c) Find the supplier name who supplied the book “Data Base Management Systems”.  (d) Find the borrower name and phone number who had issue book on 25-08-2010  (e) Find the name of the books which had been supplied by “XYZ” supplier. | **AP** | **CO4** |
| 12. | **Explain** Deadlock recovery techniques? **Explain** Deadlock Prevention techniques?  5+5 | **U** | **CO2** |

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| **SMA51142** | Discrete Mathematics | **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 develop an in-depth understanding of the algebraic structures like group, ring and field, combinatory, generating function, Recurrence relation, Graphs and Trees, mathematical logic.
2. Students should be able to demonstrate application using the above mathematical tools in computer science related courses.

**Course Outcomes:**

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

CO**1. Define** the fundamental knowledge to state the mathematical skills in Discrete Structure &Logic and allied fields.

CO2. **Define** the fundamental knowledge to state the mathematical skills in basic and advance algebraic structures.

CO3**. Demonstrate** basic concepts of combinatory including generating functions.

CO4. **Develop** the advance concept of graph theory in various mathematical fields.

**Catalog Description:**

For any program related to Computer Science Discrete study of Mathematics is very much important. The purpose of this course is to understand and use (abstract) discrete structures and advance algebraic structure that are backbones of computer science. In particular, this course is meant to introduce logic, proofs, sets, relations, functions, counting, recurrence relation and graphs, with an emphasis on applications in computer science.

**Course Content:**

**Unit I: [11 lecture hours]**

Sets, Relation and Function: Operations and Laws of Sets, Cartesian Products, Binary Relation, Partial Ordering Relation, Equivalence Relation, Image of a function, Sum and Product of Functions, Injective, Surjective and Bijective functions, Composition of Functions, Inverse of functions.

Propositional Logic: Syntax, Semantics, Validity and Satisfiability, Basic Connectives and Truth Tables, Logical Equivalence: The Laws of Logic, Logical Implication, Rules of Inference.

Proof Techniques: Some Terminology, Proof Methods and Strategies, Forward Proof, Proof by Contradiction, Proof by Contraposition, Proof of Necessity and Sufficiency. Principles of Mathematical Induction: The Well-Ordering Principle, Recursive Definitions and Inductive proofs.

**Unit II: [12 lecture hours]**

Size of a Set, Finite and infinite Sets, Countable and uncountable Sets, Cantor's diagonal argument and The Power Set theorem, Schroeder-Bernstein theorem.

The Division algorithm: Prime Numbers, The Greatest Common Divisor: Euclidean Algorithm, The Fundamental Theorem of Arithmetic.

Basics of Counting, Pigeonhole Principle, Permutations and Combinations, Discrete Probability, Generalized Permutations and Combinations, Generating Permutations.

Advanced Counting Techniques: Recurrence relations and their solutions, Divide and Conquer Relations, Generating Functions, Inclusion-Exclusion Principle.

**Unit III: [11 lecture hours]**

Algebraic Structures and Morphism: Algebraic Structures with one Binary Operation, Semigroups, Monoids, Groups, Congruence Relation and Quotient Structures, Free and Cyclic Monoids and Groups, Permutation Groups, Substructures, Normal Subgroups, Algebraic Structures with two Binary Operation, Rings, Integral Domain and Fields, Boolean Algebra, Boolean Expression and Boolean Function, Identities of Boolean Algebra, Duality. Boolean Ring

**Unit IV: [11 lecture hours]**

Graphs and Trees: Graphs and their properties, Degree, Connectivity, Path, Cycle, Sub Graph, Isomorphism, Eulerian and Hamiltonian Walks, Shortest Path Problems, Graph Colouring, Colouring maps and Planar Graphs, Colouring Vertices, Colouring Edges, List Colouring, Perfect Graph, Rooted trees, trees and sorting, weighted trees and prefix codes, Bi-connected component and Articulation Points, Spanning trees and Minimum Spanning Trees.

**Text Books:**

T1. Kenneth H. Rosen,Discrete Mathematics and its Applications, Tata McGraw - Hill.

T2. V Somasundaram, Discrete Mathematics with Graph Theory and Combinatory, Tata McGraw- Hill.

**Reference Books:**

R1. Norman L. Biggs, Discrete Mathematics, 2nd Edition, Oxford University Press.

R2. Discrete Mathematics for Computer Science”, Illustrated Edition, Kenneth Bogart, Clifford Stein, Robert L. Drysdale, Key College Publishing.

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Mid term** | **Attendance** | **Class Assessment** | **End Term** |
| **Weightage (%)** | **20** | **10** | **30** | **40** |

**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** | | | |
| **CO1** | | **Define** the fundamental knowledge to state the mathematical skills in Discrete Structure &Logic and allied fields. | | | | | | | | | | | | **PO1,PO2,PSO2** | | | |
| **CO2** | | **Define** the fundamental knowledge to state the mathematical skills in basic and advance algebraic structures. | | | | | | | | | | | | **PO1,PO2,PSO1** | | | |
| **CO3** | | **Demonstrate** basic concepts of combinatorics including generating functions. | | | | | | | | | | | | **PO1,PO2,PSO1,PSO2** | | | |
| **CO4** | | **Develop** the advance concept of graph theory in various mathematical fields. | | | | | | | | | | | | **PO1,PO2,PO5,PSO2** | | | |
|  |  | | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | | PO12 | PSO1 | PSO2 | | PSO3 |
| SMA  51142 | Discrete Mathematics | | 3 | 3 | - | - | 1 | - | - | - | - | - | - | | - | 2 | 3 | | - |

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

**Model Question Paper**

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| --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | |
| **Course: Discrete Mathematics\_SMA51142**  **Program: MCA Time: 03 Hrs. Semester: II Max. Marks: 40**  **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. | **Show** that is a valid conclusion from the premises:  . (R ) | **4** | **CO1** |
| 2. | **Show** that is an abelian group, where the binary operation is defined as .(R ) | **4** | **CO2** |
| ­­­3. | A computer company receives 50 applicants for the job of programmers. Among them 30 knew ORACLE and 28 knew JAVA and 8 did not know any of the language. **How** many of them knew both the language? (U) | **4** | **CO3** |
| 4. | **Show** that a graph is a tree if and only if it is minimally connected. (AP) | **4** | **CO4** |
| **SECTION B (**Attempt any **Two Questions)** | | | |
| 5. | i) **Show** that the cube roots of unity forms an abelian group under complex multiplication. (R )  ii) Using the generating function, **find**. (U) | **5+5** | **CO2**  **CO3** |
| 6. | **i) What** is the validity of the argument:  If I pass B.Tech with high YGPA, I will be assured of a good job. If I am assured of a good job then my father will be happy. My father is not happy. Therefore I do not pass with high YGPA. (R )  ii) **Show** that the following mathematical statement P() : is true by principle of mathematical induction. (R ) | **4**  **6** | **CO1**  **CO2** |
| 7. | i) **Find** the CNF of , without using truth table. (R )  ii) **Classify** the coefficient of in . (U ) | **4**  **6** | **CO1**  **CO3** |
|  | **SECTION C is Compulsory** |  | |
| 8. | **Apply** graph theory to show that a graph is disconnected if and only if its vertex set is partitioned into two non empty disjoint subsets V1 and V2 such that there exists no edge in G whose one end vertex in V1 and another is in V2 . (AP) | **8** | **CO4** |

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| **ECS51242** | Mobile Application using Android/IoS 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:**

* To introduce students familiar with client server architecture.
* To develop a web application using java technologies
* To develop skills and project-based experience needed for entry into web application and development careers.

**Course Outcomes:**

CO1**. Produce** apps for iOS platform devices (iPhone/iPad/iPod Touch)

CO2**. Develop** a working knowledge of Apple’s Xcode app development tool

CO3**. Identify** need and opportunity in app markets

**Catalog Description:**

Although they have only become widely used in the past few years, mobile devices have already had a tremendous impact on our culture and its social dynamics. Recent rapid growth in the mobile device market has not been primarily driven by voice communications, but rather by the limitless ways in which these devices may be used to explore our local environments. These new communicative modes are expressed through small and self-contained “apps” that are focused around a central concept, and that leverage many of the advanced features of these devices to augment a user’s understanding of her environment. This course operates in two distinct but related modes: development, wherein an app is made functional; and design, through which an app is made usable. Students will be expected to consider both modes when producing their apps. Students will work throughout the semester to produce a compelling app of interest to the UNC community

**Course Content:**

**List of Experiments:**

1. Introduction to Android platform and the tools used in the lab, demonstrating various mobile apps such as Google Drive, Google Assistant and Google Maps to get an essence of the hardware and software advancement

2. Illustrating the structure of an Android Project, Creating a new AVD and Create a simple Android application that displays the message “Welcome to Android Development”. Test this app on an AVD.

3. Developing of an application with Graphical User Interface such as Task Scheduler app to keep track of the tasks the user needs to complete within a specific due date.

4. Developing Movie Rating App to add validation for the inputs and handling UI events.

5. Enhancing the Movie Rating App for handling data in the mobile app to display the list of reviews in the app fetched from the SQLite database.

6. Enhancing the Task Scheduler app for handling data in the mobile app to store in the database and display the task details entered by the user.

7. Developing a Note Management app to store and retrieve data from a file.

8. Enhancing the Movie Rating App to create options and context menu for adding new reviews, exit option etc.

9. Enhancing the Movie Rating App to create notifications such as a confirm delete dialog box during deleting a review.

10. Developing of a Media Player app to gain knowledge on the integration of graphics and multimedia with a mobile app.

11. Securing an Android app by declaring permissions using graphical user interface.

12. Developing of an app Find the Greatest that accepts three numbers from the user and computes the greatest of the three numbers. Test the project to find whether it is working properly or not by creating a test project for the app.

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Produce**apps for iOS platform devices (iPhone/iPad/iPod Touch) | **PO1, PO2** |
| **CO2** | **Develop**a working knowledge of Apple’s Xcode app development tool | **PO1, PO2, PO4** |
| **CO3** | **Identify**need and opportunity in app markets | **PO1, PO3, PO5** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  51242 | Mobile Applications using Android/IoS Lab | 3 | 2 | 1 | 1 | 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: MCA Semester: II Stream: CSE

PAPER TITLE: Mobile Applications using Android/IoS Lab PAPER CODE: ECS51242

Maximum Marks: 40 Time duration: 3 hours

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

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **Developing** Movie Rating App to add validation for the inputs and handling UI events | **U** | **CO1** |
| 2. | **Write**Dynamic HTML with Java Script. | **Ap** | **CO1** |
| 3. | **Write** the steps of Compiling and Installing the Servlet | **Ap** | **CO2** |
| 4. | **Examine**JDBC Process. | **Ap** | **CO2** |
| 5. | **Describe** Database Connection. | **U** | **CO6** |

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| **ECS51244** | Object Oriented Programming with Java 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:**

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** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Define**classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem | **PO1, PSO1** |
| **CO2** | **Illustrate** object oriented modelling techniques like classes and Instances modelling techniques | **PO1, PO2, PO4, PSO1, PS03** |
| **CO3** | **Solve** programs using standard design patterns. | **PO1, PO2, PO4, PSO1** |
| **CO4** | **Interpret**fundamentals of object-oriented programming in Java, including defining classes, invoking methods, using class libraries, etc. | **PO1, PO4, PSO1** |
| **CO5** | **Construct**programming solutions with exception handling and multi-threading concept | **PO1, PO2, PO4, PSO1, PSO3** |
| **CO6** | **Solve**GUI program with proper event handling techniques | **PO1, PO2, PO4, PSO1, PSO3** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  51244 | Object Oriented Programming with Java Lab | 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: MCA Semester: II Stream: CSE

PAPER TITLE: Object Oriented Programming with Java Lab PAPER CODE: ECS51244

Maximum Marks: 40 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. | **Develop** a java program to implement the concept of method overloading. | **Ap** | **CO2, CO3** |
| 2. | **Develop** a java program to implement the concept of method overriding. | **Ap** | **CO2, CO3** |
| ­­­ 3. | **Develop** a java program to implement the concept of nesting of methods. | **Ap** | **CO1, CO3** |
| 4. | **Develop** a java program to implement multiple inheritance. | **Ap** | **CO2, CO3** |
| 5. | **Develop** a java program to implement the concept of multithreaded programming. | **Ap** | **CO2, CO5** |

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| **ECS51246** | 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:**

* To introduce students with the architecture of Unix OS.
* To provide necessary skills for developing and debugging programs in UNIX environment.
* To develop student 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.
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** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

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

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  51246 | Operating System Lab | 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: MCA Semester: IICode- ECS51246 Stream- CSETime: 03 Hrs.Paper title– Operating System Lab Total pages- 1Max. Marks: 40 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 (Answer All questions)(8 x 5=40)** | | | | |
| 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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| **ECS51248** | 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:**

* To understand the different issues involved in the design and implementation of a database system.
* To study the physical and logical database designs, database modelling, relational, hierarchical, and network models
* To understand and use data manipulation language to query, update, and manage a database
* To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency,
* To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling, designing, and implementing a DBMS.

**Course Outcomes:**

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

CO1. **Identify** the use of Database Systems in different software and applications.

CO2. **Develop** the queries using SQL in database creation interaction.

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

using the system.

**Catalog Description:**

This course introduces the core principles and techniques required in the design and implementation of database systems. This introductory application-oriented course covers the relational database systems RDBMS - the predominant system for business scientific and engineering applications at present. It includes Entity-Relational model, Normalization, Relational model, Relational algebra, and data access queries as well as an introduction to SQL. It also covers essential DBMS concepts such as: Transaction Processing, Concurrency Control and Recovery. It also provides students with theoretical knowledge and practical skills in the use of databases and database management systems in information technology 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** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | Organize the basic concepts of Database Systems and Applications. | **PO1,PO4,PSO1,PSO2** |
| **CO2** | Construct the basics of SQL and construct queries using SQL in database creation interaction. | **PO2,PO3, PSO3** |
| **CO3** | Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system. | **PO4,PO5,PSO2** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  51248 | Database Management Systems Lab | 1 | 1 | 1 | 2 | 1 | - | - | - | - | - | - | - | 1 | 2 | 1 |

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

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

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

PAPER TITLE: Database Management Systems Lab PAPER CODE: ECS51248

Maximum Marks: 40 Time duration: 3 hours

Total No of questions: 5 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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| --- | --- | --- | --- |
| **Part A (1X 20=20)** | | | |
| Q1. | 1. **Table: *Customer***  |  |  |  | | --- | --- | --- | | **Column Name** | **Format** | **Remarks** | | **Customer\_ID** | **Varchar(3)** | **Primary Key** | | **Last\_Name** | **Char(20)** |  | | **First\_Name** | **Char(20)** | **Not Null** | | **Area** | **Varchar(30)** |  | | **Phone\_No** | **Number(10)** |  |  1. **Table: *Movie\_Gallery***  |  |  |  | | --- | --- | --- | | **Column Name** | **Format** | **Remarks** | | **Movie\_No** | **Varchar(3)** | **Primary Key** | | **Movie\_Title** | **Char(20)** | **Not Null** | | **Movie\_Type** | **Char(10)** | **Not Null** | | **Movie\_Rating** | **Number(05)** |  | | **CD\_Rack\_No** | **Number(05)** |  |  1. **Table: *Invoice\_Details***  |  |  |  | | --- | --- | --- | | **Column Name** | **Format** | **Remarks** | | **Invoice\_No** | **Varchar(3)** | **Primary Key** | | **Movie\_No** | **Char(20)** | **Foreign Key(Table 2)** | | **Customer\_ID** | **Varchar(3)** | **Foreign Key(Table 1)** | | **Issue\_Date** | **Date** |  | | **Return\_Date** | **Date** |  |   **Please enter at least 15 values for each table. Please follow your query before entering your values.** | **R** | **CO1, CO2** |
| **Part-B (4X5=20)** | | | |
| Q2. | Create a SQL query to find out the from where most of the customer resides. | **U** | **CO2** |
| Q3. | Find the movie name which had been rented highest no of times. | **R** | **CO3** |
| Q4. | Write a SQL query to find the average price of a movie. | **AP** | **CO2** |
| Q5. | Select the First name and phone number of the customers who had rented the movie “xyz”. | **R** | **CO2** |

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| **ECS52141** | Web Technology | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour-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.

1. To give the students a perspective of web design language for designing a web site.
2. 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. **Understanding** of 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. **Demonstrate** effectively a web page with HTML/JavaScript/XML style.

CO5. **Create** rich internet application using XML

**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**

**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.

**Imagemaps:**Introduction, Client-Side Imagemaps, Server-Side Imagemaps, Using Server-Side And Client-Side Imagempas Together, Alternative Text For Imagemaps, 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** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understanding** of E- Mail, Telnet, FTP, E-Commerce, Video Conferencing, E-Business | **PO3,PO5,PO8,PO12,PSO2** |
| **CO2** | **Formalize**HTML Tag Reference, Global Attributes, Event Handlers, Document Structure | **PO3,PO5,PO8,PO12,PSO2** |
| **CO3** | **Classify** a detailed analysis of form, frame and CSS in HTML | **PO3,PO5,PO8,PO12,PSO1** |
| **CO4** | **Demonstrate**effectively a web page with HTML/JavaScript/XML style**.** | **PO3,PO5,PO8,PO12,PSO2** |
| **CO5** | **Create** rich internet application using XML | **PO3,PO5,PO8,PO12,PSO1** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  52141 | Web Technology | - | - | 3 | - | 3 | - | - | 3 | - | - | - | 3 | 2 | 3 | - |

**Model Question Paper**

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

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

PAPER TITLE: Web TECHNOLOGY PAPER CODE: ECS52141

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. | **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** 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 **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Describe** the characteristics of Java script arithmetic operator)?  . | **U** | **CO1** |
| 7. | **Examine** the frame with HTML tag C:\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. | **U** | **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 . | **R** | **CO4** |
| 12. | **Distinguish** XML DTD by taking suitable example? | **An** | **CO5** |

**Course Objectives:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **EEC52101** | Data Communication & Computer Network | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour-45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Computer Fundamentals** | | | | |
| **Co-requisites** | **--** | | | | |

* To become familiar with fundamentals of computer network.
* To become familiar with transmission media and data communication.
* To become familiar with addressing techniques and protocols.
* To become familiar with file transfer protocols, and concepts of secured data communication technique.

**Course Outcomes:**

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

1. **Explain** key networking concepts, principles, design issues and techniques at all protocol layers.
2. **Contrast** between different types of networks (e.g., wide area networks vs. local area networks, wired vs. wireless) in terms of their characteristics and protocols used.
3. **Describe** different types of networked applications and what underlying network protocols are needed to meet their diverse requirements.
4. **Distinguish** between control and data planes in computer networks, and their corresponding architectures in real-world networks (including the Internet).
5. **Illustrate** reliable transport protocols and networked system architectures via implementation using Socket APIs, measurement and analysis.

**Catalog Description:**

In this course, students will study architectures, protocols, and layers in computer networks and develop client-server applications. Topics include the OSI and TCP/IP models, transmission fundamentals, flow and error control, switching and routing, network and transport layer protocols, local and wide-area networks, wireless networks, client-server models, and network security. Students will extend course topics via programming assignments, library assignments and other requirements.

**Course Content:**

**Unit I: 5 lecture hours**

What Is the Internet?, Network Edge, Network Core, Delay, Loss, and Throughput in Packet-Switched Networks, Protocol Layers and Their Service Models, Networks Under Attack.

**Unit II: 8 lecture hours**

Principles of Network Applications, Web and HTTP, Electronic mail in Internet, DNS—The Internet’s Directory Service, Peer-to-Peer Applications.

**Unit III: 9 lecture hours**

Introduction and Transport-Layer Services, Multiplexing and De-multiplexing, Connectionless Transport: UDP, Connection-Oriented Transport: TCP, Principles of Congestion Control, TCP Congestion Control

**Unit IV: 9 lecture hours**

 Introduction, Virtual Circuit and Datagram Networks, Internet Protocol (IP): Forwarding and Addressing in the Internet, Routing Algorithms, Routing in the Internet, Routing in the Internet, Broadcast and Multicast Routing

**Unit V: 9 lecture hours**

Introduction to the Link Layer, Error-Detection and -Correction Techniques, Multiple Access Links and Protocols, Switched Local Area Networks, Link Virtualization.

**Unit VI: 3 lecture hours**

WhatIs Network Security? Principles of Cryptography

**Unit VII: 2 lecture hours**

What Is Network Management? Internet-Standard Management Framework

**Text Books:**

1. Computer Networking -Top Down Approach- James F. Kurose and Keith W. Ross-- Pearson 2013, sixth Edition

2. Data Communications and Networking- Behrouz A. Forouzan-McGraw-Hill 2007, fourth Edition.

**Reference Books:**

1. Data Networks- DimitriBertsekas and Robert Gallager- Prentice Hall, 1992
2. Computer Networks (5th Edition) – Andrew S. Tanenbaum, Pearson 2011

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Explain** key networking concepts, principles, design issues and techniques at all protocol layers. | **PO1, PO2** |
| **CO2** | **Contrast** between different types of networks (e.g., wide area networks vs. local area networks, wired vs. wireless) in terms of their characteristics and protocols used. | **PO3, PO4. PO6** |
| **CO3** | **Describe** different types of networked applications and what underlying network protocols are needed to meet their diverse requirements. | **PO2, PO3, PO4** |
| **CO4** | **Distinguish** between control and data planes in computer networks, and their corresponding architectures in real-world networks (including the Internet). | **PO2, PO4, PSO1** |
| **CO5** | **Illustrate** reliable transport protocols and networked system architectures via implementation using Socket APIs, measurement and analysis. | **PO12, PSO2, PSO3** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO  10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| EEC  52101 | Data Communication and Computer Network | 1 | 3 | 2 | 3 |  | 1 | - | - | - | - | - | - | 1 | 1 | 1 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION**

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

PAPER TITLE: Data Communication & Computer Network PAPER CODE: EEC52101

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, 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 questions)(5x1=5)** | | | |
| 1. | **List** the role of sender, receiver and transmission media during data communication. | **R** | **CO1** |
| 2. | **Explain** the basic elements of Quality System | **U** | **CO2** |
| ­­­ 3. | **Define** the name of all the layers of TCP/IP protocol. | **U&R** | **CO4** |
| 4. | **What** is Network Topology? | **R** | **CO3** |
| 5. | **List** the role of transmission media during data communication. | **U** | **CO5** |
|  | **SECTION B (**Attempt any **Three Questions)(3x5=15)** |  | |
| 6. | **Describe** in details all the LAN Topologies with respective diagrams. | **Ap** | **CO3** |
| 7. | **Explain** Leaky Bucket Algorithm in details. | **U** | **CO2** |
| 8. | **Explain** in details the general concept of Stop and Wait Flow Control mechanism with suitable diagram. | **An** | **CO5** |
| 9. | **What** Briefly state the difference between Pure ALOHA and Slotted ALOHA. | **U** | **CO2** |
|  | **SECTION C (Answer any Two Questions)(2x10=20)** |  | |
| 10. | **Explain**with suitable diagram the layer to layer message communication between sender and receiver using OSI model. | **E & R** | **CO4,**  **CO1, CO2** |
| 11. | **Define** Error. Explain Single bit Error and Burst Error with suitable diagrams. | **R & U** | **CO5** |
| 12. | **Explain** Two Dimensional Parity Check for Error Detection with appropriate diagram. | **E & R** | **CO2** |

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| **ECS52143** | Cyber Security | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour-45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Computer Fundamentals** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To understand of information assurance as practiced in computer operating systems, distributed systems, networks and representative applications.
* To demonstrate the familiarity with prevalent network and distributed system attacks, defences against them, and forensics to investigate the aftermath.
* To appraise a basic understanding of cryptography, how it has evolved, and some key encryption techniques used today.
* To Examine security policies (such as authentication, integrity and confidentiality), as well as protocols to
* To evaluate such policies in the form of message exchanges.

**Course Outcomes:**

On completion of this course students will be able to:

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

**Catalog 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** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

**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** |
| **CO2** | **Demonstrate** and practice the application of Network Protection tools. | **PO1** |
| **CO3** | **Appraise** the application of different types of tools against web vulnerabilities. | **PO5** |
| **CO4** | **Examine**Cyber Crime and Law. | **PO2** |
| **CO5** | **Evaluate**Cyber Crime Investigation**.** | **PO3, PSO3** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  52143 | Cyber Security | 2 | 1 | 1 | - | 1 | - | - | - | - | - | - | -  - | - | - | 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: MCA Semester: III Stream: CSE

PAPER TITLE: Cyber Security PAPER CODE: ECS52143

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. | **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** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **HEN42111** | HSS-III (English communication) | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour-45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **12th class English Fundamentals** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To know the importance and techniques of communication skills in order to improve professional skills
* To enhance the knowledge of the students on vocabulary, syntax, and grammatical skills
* To improve writing skills by applying writing techniques, tools in practice sessions
* 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

1. **Choose** grammar correctly and unambiguously
2. **Compare** formats of business communication like reports, letters, and other technical

writings

1. **Improve** competence in speaking, reading, listening, and writing in English.
2. **Build** English pronunciation and use neutral accent successfully
3. **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: 9 lecture 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, precis paragraph 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** | **Attendance** | **Class Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

**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** |
| **CO5** | **Build** English pronunciation and use neutral accent successfully | **PO5, PO6** |
| **CO6** | **Build** different other accents of spoken English | **PO5, PO6, PO11** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| HEN42111 | HSS –III (English Communication) | - | - | - | - | 3 | 3 | - | 1 | - | - | 3 | - | - | - | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name:**  **Enrolment No:** | |  | | |
| **Course: HEN42111 – HSS –III (English Communication) Program: MCA Semester: III**  **Time: 03 hrs. Max. Marks:40**  **Instructions:**  Attempt all questions from **Group A** (each carrying 1 mark); any **Three Questions** from **Group B** (each carrying 5 marks)**; any Two questions from Group 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** | |
|  | **Group C (**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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| --- | --- | --- | --- | --- | --- |
| **ECS52145** | Artificial Intelligence and Machine Learning (Elective -1) | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Basics of Algorithm, Linear Algebra, Probability, and Statistics** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To help the student to acquire knowledge of basics of artificial intelligent computing.
* To enable students to gain basic knowledge of machine learning.
* To incorporate the evolutionary computational knowledge.
* To enable students to acquire various problem solving, learning, and planning ability.
* To enable students to apply machine learning models to solve real-life problems.

**Course Outcomes:**

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

CO1**.Define** solution according to real problem, apply search proper strategies for a particular

problem, and construct logical propositions to conclude a proof statement.

CO2. **Construct** and differentiate plan for specific problem solution using various planning strategies.

CO3. **Implemen**t predictive and classification model using regression method.

CO4**.Design** and deploy Multilayer Artificial Neural Network using backpropagation algorithm for different dataset, probabilistic model using conditional probability (Baye’s Theorem).

CO5**. Construct** SVM for linearly and non-linearly (kernel method) separable data. Generate Ability to select best features from the dataset using PCA.

**Catalog Description:**

There is a growing need for talented machine learning/data scientist developers across every industry. As technology advances, the ability to build quality machine learning driven 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.

Machine Learning applies the knowledge and theoretical understanding gained through computer science to building high-quality intelligent software products. As a maturing discipline, Artificial Intelligence is becoming more and more important in our everyday lives. Our [software development and engineering](http://www.pace.edu/seidenberg/software-development-engineering-ms) professional program is University’s response to the tremendous growth of the software development industry.

**Course Content:**

**Unit I: 8 lecture hours**

**Module 1:**

Introduction, Agents, Problem formulation, Uninformed search strategies, Heuristics, Informed search strategies, Satisfying constraints

Logical agents, Propositional logic, Inference rules, First-order logic, Inferences in first order logic

**Unit II: 10 lecture hours**

Planning with state-space search, Partial-order planning, planning graphs, Planning and acting in the real world Forward and backward chaining, Unification, Resolution.

Introduction to Machine Learning: Overview of machine learning, related areas, applications, software tools, course objectives.

**Basics of Machine Learning:** Learning Topologies: Training-Testing-Validation; Error: Actual Output; Target Output; Error Optimization: Gradient Descent (SGD, Minibatch); Parameter Update; Dataset and cleaning, Normalization; Bias and Variance; Hypothesis Testing;

**Unit III: 6 lecture hours**

**Regression:** Linear Regression: Single, Polynomial Regression, Gradient Descent, ANOVA, Logistic Regression, Generalization: Ridge and Lasso regression.

**Case Study:** Media Company Case Study; Cynlate Bank Loan Disbursement.

**Unit IV: 11 lecture hours**

**Neural networks:** The perceptron algorithm, various activation functions and their differentiability, multilayer perceptrons, back-propagation, nonlinear regression, multiclass discrimination, training procedures,

Bayesian Learning, Decision Tree

**Unsupervised Learning:** Uses of Unsupervised Learning; Data Clustering: K-means and Kernel K-means;

**Unit V: 10 lecture hours**

**Support vector machines:** Functional and geometric margins, optimum margin classifier, constrained optimization, Lagrange multipliers, KKT conditions, soft margins, kernels.

**Dimensionality Reduction:** Feature Selection, Principle Component Analysis (PCA).

**Text Books:**

1.Artificial Intelligence – A Modern Approach, Second Edition, S. Russel and P. Norvig Pearson Education, 2003.

2.Artificial Intelligence, Ritch& Knight, TMH

3.“Machine Learning”, 1st Edition, Tom M. Mitchell, McGraw-Hill Series In Computer Science

**Reference Books:**

1.Artificial Intelligence; Structures for Complex Problem Solving, Fourth edition, G. Lugar, Pearson Education, 2002

2.Artificial Intelligence: A New Synthesis, Nils J. Nilsson, Morgan Kaufmann Publishing, Inc., Year 1998

3.“INTRODUCTIONTOMACHINE LEARNING”, 2005 Edition, Nils J Nillsson, Morgan Kaufmann

4.“Foundations of Machine Learning”, 2012 Edition, Mehryar Mohri, Afshin Rostamezadeh, Ameet Talwalkar, The MIT Press

5.Python Data Science Handbook Essential Tools for Working with Data”, 1st Edition, Jake Vander Plas, O’Reilly

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Define** solution according to real problem, apply search proper strategies for a particular problem, and construct logical propositions to conclude a proof statement. | **PO1, PO2, PSO3** |
| **CO2** | **Construc**t and differentiate plan for specific problem solution using various planning strategies. | **PO1, PO3** |
| **CO3** | **Implement** predictive and classification model using regression method. | **PO3, PO4** |
| **CO4** | **Design** and deploy Multilayer Artificial Neural Network using backpropagation algorithm for different dataset, probabilistic model using conditional probability (Baye’s Theorem). | **PO1, PO5, PO12, PSO1** |
| **CO5** | **Construct** SVM for linearly and non-linearly (kernel method) separable data. Generate Ability to select best features from the dataset using PCA. | **PO2, PO5, PSO1, PSO2** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS52145 | Artificial Intelligence and Machine Learning | 3 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | - | 2 | 1 | 1 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

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

PAPER TITLE: Artificial Intelligence and Machine Learning PAPER CODE: ECS52145

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, 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 Heuristic value? | **R** | **CO1** |
| 2. | **How** do you symbolize existential quantifiers? | **R** | **CO2** |
| ­­­3. | **State** if Bayesian Learning is parametric model or not? | **R** | **CO2** |
| 4. | In **which** category of clustering K-Means clustering belong to? | **R** | **CO4** |
| 5. | In PCA **which** concept of mathematics is used? | **R** | **CO3** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | Express **what** is ridge in context of Hill-Climbing algorithm? | **R** | **CO2** |
| 7. | **Explain** the theme of Backtracking search for CSP. | **U** | **CO2** |
| 8. | **What** is maximum margin classifier? Explain what are Support vectors in SVM. | **R** | **CO3** |
| 9. | **Describe** the process of PCA. How PCA helps reducing the size of the dataset? | **U** | **CO4** |
|  | **SECTION C (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Define** problem solving agents and list its algorithms. R **Why** problem formulation must follow goal Formulation? | **Ap** | **CO2** |
| 11. | **Write** short notes on: - i) Bias ii) Variance. **Explain** using Simple Linear Regression R | **An** | **CO1** |
| 12. | Cluster the dataset using K-Means clustering into 4 clusters. **Find out** the inter-cluster dissimilarity and intra-cluster similarity. | **U** | **CO4** |

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| **ECS52153** | **Fundamental of Cloud Computing (Elective-1)** | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **DBMS, Java, Python, Computer Networking** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To introduce cloud computing-based programming techniques and cloud services.
* To introduce concepts and security issues of cloud paradigm.
* To impart the fundamentals of virtualization techniques.

**Course Outcomes:**

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

CO1. **How** to provide Flexible and scalable infrastructures.

CO2. **Organize** process to reduce implementation and maintenance costs.

CO3. The case studies will help us to **understand** more of practice of cloud computing in the market.

CO4. **Determine** flexible and scalable infrastructure suitable to the organizational need.

CO5. **Comparison** of cost-wise solution to the problem and selecting the best solution for the problem suggested to the organization.

**Catalog Description:**

This course focuses on concepts of cloud, fundamental building blocks like Resource Consolidation, Hypervisor, VM etc. and the cloud service models. It gives students the insight into how to build clouds. And provides practices on building the cloud. It also gives exposure to Public and Privacy Clouds. It gives students the future directions in cloud domain.

**Course Content:**

**Unit I: 08 lecture hours**

Data communication Components: Overview, Roots of Cloud Computing, Layers and Types of Cloud, Desired Features of a Cloud, Benefits and Disadvantages of Cloud Computing, Cloud Infrastructure Management, Infrastructure as a Service Providers, Platform as a Service Providers, Challenges and Risks.

**Unit II: 10 lecture hours**

Working with Cloud- Infrastructure as a Service: conceptual model and working Platform as a Service: conceptual model and functionalities Software as a Service: conceptual model and working Technologies and Trends in Service provisioning with clouds.

Service management, Computing on demand, Identity as a Service, Compliance as a Service

**Unit III: 6 lecture hours**

Abstraction and Virtualization: Introduction to Virtualization Technologies, Load Balancing and Virtualization, Understanding Hyper visors, Understanding Machine Imaging, Porting Applications, Virtual Machines Provisioning and Manageability, Virtual Machines Manageability, Virtual Machine Migration Services, Virtual Machine Provisioning and Migration in Action, Provisioning in the Cloud Context.

**Unit IV: 10 lecture hours**

Cloud Infrastructure and Cloud Resource: Management Architectural Design of Compute and Storage Clouds, Layered Cloud Architecture Development, Design Challenges, Inter Cloud Resource Management, Resource Provisioning and Platform Deployment, Global Exchange of Cloud Resources., Administrating the Cloud, Cloud Management Products, Emerging Cloud Management Standards.

**Unit V: 11 lecture hours**

**Cloud Security**: Security Overview, Cloud Security Challenges and Risks, Software-as-a Service Security, Cloud computing security architecture: Architectural Considerations, General Issues Securing the Cloud, Securing Data, Data Security, Application Security, Virtual Machine Security, Identity and Presence, Identity Management and Access Control, Autonomic Security, Storage Area Networks, Disaster Recovery in Clouds.

**Text Books:**

1. Rajkumar Buyya et. el., Cloud Computing: Principles and Paradigms, Wiley India Edition

2. Sosinsky B., “Cloud Computing Bible”, Wiley India

**Reference Books:**

1. Mastering Cloud Computing by Rajkumar Buyya, C. Vecchiola & S. Thamarai SelviMcGRAW Hill Publication

2. Miller Michael, “Cloud Computing: Web Based Applications that Change the Way You Work and Collaborate Online”, Pearson Education India

3. Velte T., Velte A., Elsenpeter R., “Cloud Computing – A practical Approach”, Tata McGrawHill

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **How** to provide Flexible and scalable infrastructures. | **PO1, PO5,PSO2** |
| **CO2** | **Organize** process to reduceimplementation and maintenance costs. | **PO1,PO2,PSO1** |
| **CO3** | The case studies will help us to **understand** more of practice of cloud computing in the market. | **PO4,PO7,PSO2** |
| **CO4** | **Determine** flexible and scalable infrastructure suitable to the organizational need. | **PO4,PO12** |
| **CO5** | **Comparison** of cost-wise solution to the problem and selecting the best solution for the problem suggested to the organization. | **PO1,PO5,PSO3** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS52153 | Cloud Computing | 3 | 1 | 1 | 2 | 2 | - | 1 | - | - | - | - | 1 | 1 | 2 | 1 |

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

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

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

PAPER TITLE: Fundamentals of Cloud Computing

PAPER CODE: ECS52153

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** is meant Scale-Up scale-Down? | **U** | **CO2** |
| 2. | **Express** data center with example. | **U** | **CO3** |
| ­­­ 3. | **What is** Hardware Virtualization? | **R** | **CO1** |
| 4. | **Define** is cloud computing with example? | **R** | **CO3** |
| 5. | **List** the main characteristics of cloud computing? | **R** | **CO5** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Describe** in detail about Deployment Models in cloud computing. | **U** | **CO4** |
| 7. | **Distinguish** three major differencesthat separate cloud architecture from the tradition one? | **An** | **CO5** |
| 8. | **Describe** Distributed computing? | **R** | **CO2** |
| 9. | **List** the pros and cons of cloud computing. | **U** | **CO2** |
|  | **SECTION C(Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Illustrate** the following in detail  i. Demand-Driven Resource Provisioning  ii. Event-Driven Resource Provisioning  iii. Popularity-Driven Resource Provisioning | **U** | **CO3** |
| 11. | What is the difference between recovery time objective and recovery point objective? How do they depend on each other? **Justify** your answer with appropriate examples. | **E** | **CO4** |
| 12. | **Demonstrate** thee architectural design of compute and storage clouds. | **AP** | **CO2** |

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| **ECS52147** | Natural Language Processing and Its Application (Elective-II) | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours-45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Computer Programming with python, Computer Programming with Python Lab** | | | | |
| **Co-requisites** | **-** | | | | |

**Course Objectives:**

* To understand key concepts from NLP are used to describe and analyse language
* To understand semantics and pragmatics of language for processing
* To apply structured semantic models on information retrieval and natural language applications.

**Course Outcomes:**

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

CO**1. Recall** linguistic phenomena and an ability to model them with formal grammars.

CO2**. Illustrate** proper experimental methodology for training and evaluating empirical NLP

systems

CO3**. Identify** natural language processing techniques to process speech and analyse text.

CO4**. Examine** algorithms of natural language processing

CO5. **Evaluate** different language modeling Techniques.

**Catalog Description:**

This course introduces the fundamental concepts and techniques of natural language

processing (NLP). Students will gain an in-depth understanding of the computational

properties of natural languages and the commonly used algorithms for processing

linguistic information. The course examines NLP models and algorithms using both the

traditional symbolic and the more recent statistical approaches.

**Course Content:**

**Unit I: 5lecture hours**

Introduction: Context - Classical Toolkit - Text Pre-processing – Tokenization – Sentence Segmentation

Lexical Analysis: Finite State Morphonology Paradigm based Lexical Analysis - Syntactic Parsing – Cocke-Kasami-Younger Algorithm – Deductive Parsing – LR Parsing – Constraint based Grammars – Issues in Parsing

Semantic Analysis: Theories and approaches to Semantic Representation – Fine Grained Lexical

Case studies - Natural Language Generation – Components of a Generator – Approaches to Text Planning – Linguistic Component.

**Unit II: 11lecture hours**

Corpus Size, Representation, Sampling – Data Capture – Corpus Markup and Annotation – Multilingual Corpora – Multimodal Corpora -Corpus Annotation Types

Morphosyntactic Annotation – Treebanks: Syntactic, Semantic, and Discourse Annotation - Process of Building Treebanks - Applications of Treebanks - Searching Treebanks.

Fundamental Statistical Techniques: Binary Linear Classification – One-versus-All Method for Multi-Category Classification - Maximum Likelihood Estimation - Generative and Discriminative Models - Mixture Model and EM - Sequence Prediction Models.

Part-of-Speech Tagging: General Framework – POS Tagging Approaches – Other Statistical and Machine Learning Approaches.

Statistical Parsing: Basics - Probabilistic Context-Free Grammars - Generative Models – Discriminative Models - Beyond Supervised Parsing.

**Unit III: 10lecture hours**

Multiword Expressions (MWE): Linguistic Properties, Types, Classification of MWEs – Research Issues

Methods of Word Similarity – Normalized Web Distance Method – Kolmogorov Complexity – Information Distance – Normalized Web Distance – Applications –

Word Sense Inventories and Problem Characteristics – Applications of Word Sense Disambiguation – Approaches to Sense Disambiguation: Supervised, Lightly Supervised and Unsupervised.

**Unit IV: 10lecture hours**

Modern Speech Recognition: Architectural Components – Historical Developments – Speech Recognition Applications – Technical Challenges and Future Research Directions

Alignment: Basics – Sentence Alignment – Character, Word, Phrase Alignment – Structure and Tree Alignment – Biparsing and ITG Tree Alignment

Statistical Machine Translation: Approaches – Language Models – Parallel Corpora – Word Alignment – Phrase Library – Translation Models – Search Strategies – Research Areas.

**Unit V: 09lecture hours**

Information Retrieval – Indexing – IR Models – Evaluation and Failure Analysis

Natural Language Processing and Information Retrieval – Question Answering – Generic Question Answering System – Evaluation of Question Answering system – Multilingualism in Question Answering System

Recent trends and Related Works – Information Extraction – IE with Cascaded Finite State Transducers – Learning based Approaches in IE – Report generation – Emerging Applications of Natural language Generation in Information – Biomedical Text Mining – Sentiment Analysis and Subjectivity.

**Text Books:**

1. Daniel Jurafsky and James H. Martin Speech and Language Processing (2nd Edition), Prentice Hall; 2 editions, 2008

2. Foundations of Statistical Natural Language Processing by Christopher D. Manning and Hinrich Schuetze, MIT Press, 1999

**Reference Books:**

1.James Allen, Natural Language Understanding, Addison Wesley; 2 edition 1994

2.Steven Bird, Ewan Klein and Edward Loper Natural Language Processing with Python, O’Reilly Media; 1 edition, 2009

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Mid Term** | **Attendance** | **Class Assessment** | **End Term** |
| **Weightage (%)** | **20** | **10** | **30** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Recall** linguistic phenomena and an ability to model them with formal grammars. | **PO1,PO2, PO3,PO4,PO5, PSO1,PSO3** |
| **CO2** | **Illustrate** proper experimental methodology for training and evaluating empirical NLP systems | **PO1,PO2,PO3,PO4,PO5**  **PSO1, PSO3** |
| **CO3** | **Identify** natural language processing techniques to process speech and analyse text. | **PO1,PO2,**  **PO3,PO4, PO5,PSO1, PSO3** |
| **CO4** | **Examine** algorithms of natural language processing | **PO1,PO2,PO3,**  **PO4,PO5 ,PSO1,PSO3** |
| **CO5** | **Evaluate** different language modeling Techniques. | **PO1,PO2,PO3,PO4, PO5, PSO1, PSO3** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS52147 | Natural Language Processing and Its Applications | 3 | 3 | 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: MCA Semester: IIICode- ECS52147 Stream- CSETime: 03 Hrs.Paper title– Natural Language Processing and Its Applications Total pages- 1Max. Marks: 40 Total no. of questions- 12Instructions: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 Carrying10 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)** | | | | | |
| 1. | **Explain** the concept of Hidden Markov Model. | | **U** | **CO1**  **CO2** | |
| 2 | **What** is IDF? | | **R** | **CO3** | |
| 3. | **How** a natural language model is being tested? Name some packages used for NLP tasks. | | **U** | **CO1** | |
| ­­­4. | Suppose a real case where you have to **identify** the customers to be included in a promotional campaign for maximizing response regarding a product in a textual form. What kind of methods would you suggest to analyze the responses? | | **U** | **CO1** | |
| 5. | **Explain** the concept of Latent Semantics Indexing. Suppose we want to extract some features. Is it possible in NLP? If yes how it can be done? | | **U** | **CO2**  **CO3** | |
|  | **SECTION B (**Attempt any **Three Questions)** | |  | | |
| 6. | **Design** a grammar that handles C English-subject verb agreement. The grammar that can be handled as follows   1. She sings 2. We sing | | **U** | **CO1**  **CO3** | |
| 7. | **What** are the major challenges in NLP? What is morphology? Briefly explain the concept of parts of speech tagging. | | **R** | **CO3**  **CO4** | |
| 8. | **Explain** working of Information retrieval Systems with proper schematic diagram. | | **U** | **CO4**  **CO5** | |
| 9. | **Compare** Information Extraction and Information Retrieval in NLP Applications. | | **U** |  | |
|  | **SECTION C (**Attempt any **Two Questions)** | |  | | |
| 10. | Levenshtein edit distance is the number of insertions, substitutions, or deletions required to convert to one string to other.   1. **Define** a finite-state acceptor that accepts all strings with edit distance *l* from the target string. *Target* 2. **How** to generalize design to accept all strings edit distance from the target string equal to d. If the target string has length *l,* what is the minimal number of states required? | | **U** | **CO1**  **CO2** | |
| 11. | **How** Hidden Markov Model is used in speech processing? Explain with the help of state diagram. | | **Ap** | **CO4** | |
| 12. | Sentiment Analysis are used as Social Media Analytics. **Explain** with the help of some example. | | **U** | **CO5** | |

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| **ECS51150** | **Data Warehousing & Data Analytics(Elective-II)** | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **DBMS, Java, Python, Computer Networking** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To be familiar with mathematical foundations of data mining tools.
* To understand and implement classical models and algorithms in data warehouses and data mining
* To characterize the kinds of patterns that can be discovered by association rule

mining, classification and clustering.

* To understand the Big Data Platform and its Use cases
* To provide an overview of Apache Hadoop
* To provide HDFS Concepts and Interfacing with HDFS
* To understand Map Reduce Jobs

**Course Outcomes:**

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

CO1. **Understand** the functionality of the various data mining and data warehousing component.

CO2. **Appreciate** the strengths and limitations of various data mining and data warehousing models.

CO3. **Explain** the analyzing techniques of various data.

CO4. **Identify** Big Data and its Business Implications.

CO5. **List** the components of Hadoop and Hadoop Eco-System

**Catalog Description:**

This course will introduce the concepts of data ware house and data mining, which gives a complete description about the principles, used, architectures, applications, design and implementation of data mining and data ware housing concepts along with the added advantage of data analytics. Which will familiarize students with big data analysis as a tool for addressing substantive research questions. The course begins with a basic introduction to big data and discusses what the analysis of these data entails, as well as associated technical, conceptual and ethical challenges. Strength and limitations of big data research are discussed in depth using real-world examples.

**Course Content:**

**Unit I: 09 lecture hours**

Data Warehouse Fundamentals: Introduction  to Data Warehouse, Data Warehouse Environment, OLTP Systems; Differences between   OLTP Systems and Data Warehouse: Characteristics of Data Warehouse; Functionality of Data Warehouse: Advantages and Applications of Data Warehouse; Advantages, Applications

Planning and Requirements: Introduction: Planning Data Warehouse and Key Issues: Planning and Project Management in constructing Datawarehouse: Data Warehouse Project; Data Warehouse development Life Cycle, Kimball Lifecycle Diagram, Requirements Gathering Approaches: Team organization, Roles, and Responsibilities:

**Unit II: 6 lecture hours**

Data Warehouse Architecture: Introductions, Components of Data warehouse Architecture: Data Warehouse vs Data Mart, Component based architecture, Dimensional Modelling: Introduction: E-R Modelling: Dimensional Modelling: E-R Modelling VS Dimensional Modelling: Data Warehouse Schemas; Star Schema, Inside Dimensional Table.

**Unit III: 8 lecture hours**

Bring data into data warehouse: ETL, Role of data transformation, Data Warehouse & OLAP: Introduction: What is OLAP? Characteristics of OLAP, Steps in the OLAP Creation Process, Advantageous of OLAP: What is Multidimensional Data: OLAP Architectures; MOLAP, ROLAP, HOLAP.

**Unit IV: 10 lecture hours**

Data pre-processing : Data cleaning , Data transformation , Data mining knowledge representation, Data Mining Algorithms: Association Rules, Classification, Prediction Data Definitions and Analysis Techniques Elements, Variables, and Data categorization Levels of Measurement Data management and indexing Introduction to statistical learning Descriptive Statistics: Measures of central tendency, Measures of location of dispersions, Basics and Usage of Rapidminer and Weka as mining tool.

**Unit V: 12 lecture hours**

Basic analysis techniques Statistical hypothesis generation and testing Chi-Square test t-Test Analysis of variance Correlation analysis Maximum likelihood test. Foundation of Data Analytics: - Introduction ,Evolution , Concept and Scopes , Data , Metrics and Data classification, Data Reliability & Validity, Problem Solving with Analytics, Different phases of Analytics in the business and Data science domain, Descriptive Analytics, Predictive Analytics and Prescriptive Analytics , Different Applications of Analytics in Business, Data analysis techniques: Regression analysis; Classification techniques; Clustering: Association rules analysis. Case studies and projects: Understanding business scenarios; Feature engineering and visualization;

Case Studies: Finance, Car Sales, Bank Customer Complaints, etc.

**Text Books:**

1. Data Ware Housing Fundamentals, Pualraj Ponnaiah, Wiley Student Edition

2. Data Mining-Concepts and Techniques- Jiawei Han, Micheline Kamber, Morgan Kaufmann Publishers, Elsevier, 2 Edition, 2006.

3. Data Warehousing, Data Mining, and OLAP, Alex Berson, Stephen J. Smith, MGH, 1998.

4. Data Analytics: Become A Master In Data Analytics, Richard Dorsay, CreateSpace Independent Publishing Platform.

**Reference Books:**

1. The Data Ware House Life Cycle Toolkit- Ralph Kimball, Wiley Student Edition.

2. Data Mining Introductory and advanced topics –MARGARET H DUNHAM, PEARSON EDUCATION

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understand** the functionality of the various data mining and data warehousing component. | **PO1,PSO2** |
| **CO2** | **Appreciate** the strengths and limitations of various data mining and data warehousing models. | **PO2,PO4,PSO1** |
| **CO3** | **Explain** the analyzing techniques of various data. | **PO1,PO2,PO5,PSO2** |
| **CO4** | **Identify** Big Data and its Business Implications. | **PO1, PO5,PSO3** |
| **CO5** | **List** the components of Hadoop and Hadoop Eco-System. | **PO5,PO7,PSO2** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS51150 | Data Warehousing & Data Analytics | 3 | 2 | - | 1 | 3 | - | 1 | - | - | - | - | - | 1 | 3 | 1 |

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

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

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

PAPER TITLE: Data Warehousing & Data Analytics

PAPER CODE: ECS51150

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.

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| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 1 = 5)** | | | |
| 1. | **List** the key features of Data Ware house? | **R** | **CO1** |
| 2. | **What** do you mean by HiveQL Data Definition Language? | **R** | **CO4** |
| ­­­ 3. | **Explain** how big data processing differs from distributed processing? | **U** | **CO5** |
| 4. | **List** various application of big data? | **R** | **CO5** |
| 5. | **Define** Data Mart? | **R** | **CO2** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | With proper examples **compare** structured, unstructured and semi-structured data? **Describe** how type of data affects data serialization? | **U** | **CO5** |
| 7. | Name the OLAP operations and **explain** about various schemas? | **U** | **CO3** |
| 8. | **Explain** about Multidimensional data models? | **R** | **CO2** |
| 9. | **Discuss** briefly with an example about multidimensional schemas? | **U** | **CO1** |
|  | **SECTION (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Identify** the areas where Big data analytics can be useful for a smart city? Write a short note on NoSQL databases? | **AP & R** | **CO4** |
| 11. | **Discuss** briefly about data smoothing techniques? | **E** | **CO2** |
| 12. | **Explain** mining of huge amount of data (eg: billions of tuples) in comparison with mining a small amount of data (Eg: data set of few hundred of tuples). | **AP** | **CO2** |

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| **ECS52155** | **Cloud Storage (Elective -II)** | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **DBMS, Java, Python, Computer Networking** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To introduce cloud computing-based programming techniques and cloud services.
* To introduce concepts and security issues of cloud paradigm.
* To impart the fundamentals of virtualization techniques.

**Course Outcomes:**

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

CO1. **Explain** the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing.

CO2. **Identify** the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc..

CO3. **Explain** the core issues of cloud computing such as security, privacy, and interoperability CO4. **Determine** flexible and scalable infrastructure suitable to the organizational need.

CO4.**Identify** problems, and explain, analyze, and evaluate various cloud computing solutions.

CO5. **Explain** the appropriate cloud computing solutions and recommendations according to the applications used.

**Catalog Description:**

This course provides a post graduate-level comprehensive introduction to cloud computing with an emphasis on advanced topics. The objective of this course is to provide graduate students of MCA with the comprehensive and in-depth knowledge of Cloud Computing concepts, technologies, architecture and applications by introducing and researching state-of-the-art in Cloud Computing fundamental issues, technologies, applications and implementations. Another objective is to expose the students to frontier areas of Cloud Computing and information systems, while providing sufficient foundations to enable further study and research. The goal of the final paper is to present a new idea or innovation using cloud computing.

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**Course Content:**

**Unit I: 8 lecture hours**

**Virtualized data center architecture:**  Cloud infrastructures; public, private,Hybrid Cloud**,**  Service provider interfaces; Saas, Paas, Iaas**,**  VDC environments; concept, planning and design**,**  Business continuity principles, Disaster recovery principles, Managing VDC, Managing cloud environments and infrastructures.

**Unit II: 10 lecture hours**

**Information storage security & design**: Storage strategy and governance; Security and regulations, Designing secure solutions; The considerations and implementations involved, Securing storage in virtualized environments., Securing storage in cloud environments,Monitoring and management; Security auditing and SIEM.

**Unit III: 6 lecture hours**

**Information availability design:**  Designing backup/recovery solutions to guarantee data availability in a virtualized environment, Design a replication solution, local remote and advanced, Investigate Replication in NAS and SAN environments, Data archiving solutions; analyzing compliance and archiving design considerations.

**Unit IV: 10 lecture hours**

**Storage network design:**  Architecture of storage, analysis, Planning, Storage network design considerations; NAS and FC sans, Hybrid storage networking technologies (iscsi, FCIP, fcoe), Design for storage virtualization in cloud computing, Host system design considerations.

**Unit V: 11 lecture hours**

**Optimization of cloud storage:**  Global storage management locations, Scalability, Operational efficiency. Global storage distribution; terabytes to petabytes and greater, Policy based information management; metadata attitudes; file systems or object storage.

**Text Books:**

1. Greg Schulz, “Cloud and Virtual Data Storage Networking”, Auerbach Publications [ISBN: 978-1439851739], 2011.
2. Marty Poniatowski, “Foundations of Green IT” Prentice Hall; 1 edition [ISBN: 978-0137043750], 2009.

**Reference Books:**

1. Mastering Cloud Computing by Rajkumar Buyya, C. Vecchiola & S. Thamarai SelviMcGRAW Hill Publication

2. Miller Michael, “Cloud Computing: Web Based Applications that Change the Way You Work and Collaborate Online”, Pearson Education India

3. Velte T., Velte A., Elsenpeter R., “Cloud Computing – A practical Approach”, Tata McGrawHill

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Explain** the main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for state-of-the-art cloud computing | **PO1, PO2. PO6** |
| **CO2** | **Identify** the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc. | **PO3, PO4, PO7** |
| **CO3** | **Explain** the core issues of cloud computing such as security, privacy, and interoperability. | **PO4, PO12** |
| **CO4** | **Identify** problems, and explain, analyze, and evaluate various cloud computing solutions. | **PO12, PSO2, PSO3** |
| **CO5** | **Explain** the appropriate cloud computing solutions and recommendations according to the applications used. | **PSO2, PSO3** |

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|  |  | **Computational Knowledge** | **Problem Analysis** | **Design / Development of Solutions** | **Design / Development of Solutions** | Modern Tool Usage | **Professional Ethics** | **Life-long Learning** | **Project Management and Financ** | **Communication Efficacy** | **Societal & Environmental Concern** | **Individual & Team Work** | **Innovation and Entrepreneurship** | **Globally expertise the technological planning and development of software applications in the usage of the modern era.** | **Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare.** | **Ability to enhance and develop techniques for independent and lifelong learning in computer application.** |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS52155 | Elective – II (Cloud Storage) | 1 | 1 | 1 | 2 | - | 1 | 1 | - | - | - | - | 2 | - | 2 | 2 |

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

**Model Question Paper**

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION**

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

PAPER TITLE: Elective Course – II (Cloud Storage) PAPER CODE: ECS52155

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. | **Define** Hybrid Cloud. | **R** | **CO1** |
| 2. | **What** are the advantages of Cloud Computing? | **U** | **CO2** |
| ­­­ 3. | **What** are some of the popularly used cloud computing services? | **U&R** | **CO3** |
| 4. | **Explain** DFS**.** | **R** | **CO1, CO4** |
| 5. | **What** is Hybrid IT? | **R & U** | **CO5** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Describe** the different cloud service models? | **Ap** | **CO3** |
| 7. | **What** is the difference between the Hybrid Cloud and Hybrid IT? | **U** | **CO2** |
| 8. | **What** is The Packaging of Hybrid Cloud? | **An** | **CO5** |
| 9, | **What** is cloud computing? |  |  |
|  | **SECTION C(Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **What** is a Distributed Cloud? | **E & R** | **CO3,**  **CO1, CO2** |
| 11. | **What** is a multi-cloud strategy? | **R & U** | **CO5** |
| 12. | **What** are the two main types of packaged hybrid cloud? | **U** | **CO4** |

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| **ECS52245** | Artificial Intelligence and Machine Learning Lab using Tensor flow | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Data Structure and Python Basics** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To help students gain practical insights of AI Algorithm through functional programming.
* To enable students, communicate with clarity and precision of ML Algorithm.
* To give the students a perspective enhancement of present system.
* To enable students to make a comparative study and further improvement.

**Course Outcomes:**

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

1. **Implement** and Evaluate different search strategies using Prolog.
2. **Execute** and Memorize and different various libraries and the most frequently used functions, methods, constants required for the implementation of any machine learning.
3. **Implement and Appraise** Linear and Logistic Regression and Classify using K-NN for smaller dataset.
4. I**mplement** clustering algorithm and judge the appropriate clustering method for a particular dataset. Also, to design Artificial Neural Network for different dataset and to classify for multiclass datasets.
5. **Implement D**ecision Tree and Naïve Bayes classifier, Design Linear SVM and appraise.

**Catalog Description:**

Every laboratory course brings an open world to a student. It helps the most in exploring and innovating. In Artificial Intelligence and Machine Learning Lab all experiments are given based on real-life problems. Through this kind of practice students become more analytic more inclined to practical thinking. Also, this course brings inquisitiveness to the students. This course is a rationale to the advance courses such as Artificial Neural Network and Deep Learning”, “Soft Computing”, etc. First Part of this course is the implementation of some important Artificial intelligence aspects such as Agents, Knowledge Representation and Planning. The later part implements all major Machine Learning algorithms with the online datasets.

**Course Content:**

**Experiments:**

1. Introduction to Tensorflow:
   1. Introduction;
   2. Installation; Introduction to Tensors – Variable, Constants; Data Flow Graph; TensorBoard; Mathematics with TensorFlow.
2. Starting with Machine Learning using TensorFlow:
   1. Linear Regression (Lasso and Ridge Regression, Elastic Net Regression)
   2. Dataset loading
   3. Gradient Descent Algorithm
   4. Accuracy
   5. Optimization
   6. ROC and AUROC Curve generation
   7. Nearest Neighbour Model (K-NN) Classifier
   8. Data Clustering (K-Means, K-Medoid, Hierarchical Clustering)
3. Artificial Neural Network
   1. Introducing Neural Networks
   2. TensorFlow implementation of Single Layer Perceptron using logistic regression
      1. Building the model
      2. Fit the model
      3. Test evaluation
   3. TensorFlow implementation of Multi-Layer Perceptron
   4. Multi-Layer Perceptron classification
      1. Build the model
      2. Fit the model
      3. Test evaluation
   5. Multi-Layer Perceptron function approximation
      1. Build the model
      2. Fit the model
      3. Test evaluation
4. Bayesian Method implementation using TensorFlow
5. Decision Tree
   1. Implementation of ID3 algorithm using Tensorflow
6. Support Vector Machine (SVM)
   1. Linear SVM
   2. Reduction to Linear Regression
   3. SVM Kernels in TensorFlow
   4. Implementation of a Non-Linear SVM
   5. Implementation of a Multi-Class SVM
7. Principle Component Analysis using TensorFlow
   1. Linear Dependence and Span
   2. Norms
   3. Special Kinds of Matrices and Vectors
   4. Eigen decomposition
   5. Singular Value Decomposition
   6. The Moore-Penrose Pseudoinverse
   7. The Trace Operator
   8. The Determinant

**Text Books:**

1. G. Zaccone, Getting started with TensorFlow: Get up and running with the latest numerical computing library by google and dive deeper into your data! Community experience distilled, Packt Publishing, 2016.
2. A. G´eron, Hands-on machine learning with SciKit-Learn, Keras, And TensorFlow: Concepts, tools, and techniques to build intelligent systems, O’Reilly Media, Incorporated, 2019.

**Reference Books:**

1. “Python Data Science HandbookEssential Tools for Working with Data”, 1st Edition, Jake VanderPlas, O’Reilly

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Implement** and Evaluate different search strategies using Prolog | **PO4, PSO1** |
| **CO2** | **Execute** and Memorize and different various libraries and the most frequently used functions, methods, constants required for the implementation of any machine learning | **PO2, PSO1** |
| **CO3** | **Implemen**t and Appraise Linear and Logistic Regression and Classify using K-NN for smaller dataset. | **PO1, PO3, PSO1** |
| **CO4** | **Implemen**t clustering algorithm and judge the appropriate clustering method for a particular dataset. Also, to design Artificial Neural Network for different dataset and to classify for multiclass datasets | **PO3, PO5, PSO2** |
| **CO5** | **Implement** Decision Tree and Naïve Bayes classifier, Design Linear SVM and appraise. | **PO3, PO5, PSO2** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Computational Knowledge** | **Problem Analysis** | **Design / Development of Solutions** | **Design / Development of Solutions** | Modern Tool Usage | **Professional Ethics** | **Life-long Learning** | **Project Management and Financ** | **Communication Efficacy** | **Societal & Environmental Concern** | **Individual & Team Work** | **Innovation and Entrepreneurship** | **Globally expertise the technological planning and development of software applications in the usage of the modern era.** | **Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare.** | **Ability to enhance and develop techniques for independent and lifelong learning in computer application.** |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  52245 | Artificial Intelligence and Machine Learning Lab | 1 | 1 | 3 | 1 | 2 | - | - | - | - | - | - | - | 3 | 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: MCA Semester: III Stream: CSE

PAPER TITLE: Artificial Intelligence and Machine Learning Lab using Tensor flow PAPER CODE: ECS52245

Maximum Marks: 40 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 8 = 40)** | | | |
| 1. | **Implement** A\* search strategy using Python. Don’t use any Python library for implementing A\* search. Only basic libraries are to be used. Display the heuristic value at each step. | **Ap** | **CO1** |
| 2. | **Solve** Hill Climbing problem to overcome local minima problem by writing a program. | **Ap** | **CO2** |
| 3. | **Implement Fuzzy K-Means clustering.** Use Sklearn library of Python. | **Ap** | **CO3** |
| 4. | **Write** a prolog program to determine if a string is a palindrome or not. | **U** | **CO1** |
| 5. | **Implement** PCA. | **Ap** | **CO3** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ECS52253** | **Foundation of Cloud Computing Lab** | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **DBMS, Java, Python** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

1. To understand the installation of hypervisors.

2. To understand the installation of different cloud simulation tools and cloud setup tools.

3. To deploy cloud services.

**Course Outcomes:**

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

CO1. **Describe** the key concepts and technologies in cloud computing.

CO2. **Evaluate** cloud computing technologies and platforms in the context of the needs of a specific application

CO3. **Design** data storage components for cloud-based software systems.

CO4**. Assess** and monitor resource use of applications in virtualized environments

CO5. **Design, implement, and deploy** cloud applications for current cloud platforms

CO6. **Evaluate** privacy and security issues for cloud infrastructure and cloud applications

**Catalog Description:**

This course introduces students to fundamentals of cloud computing and software development for cloud platforms. It covers topics such as virtualization, architecture of cloud systems, programming for the cloud, resource management, as well as privacy and security issues. Students gain practical experience developing applications for cloud platforms through a series of hands-on assignments.

**Course Content:**

**Experiment 1:**

Introduction to cloud computing

**Experiment 2:**

Hands on creation of virtual machine using computer server.

**Experiment 3:**

Design virtual machine

**Experiment 4:**

Key based authentication and login virtual machine from the host machine

**Experiment 5:**

Create Backend logic to communication with frontend app using Ajax

**Experiment 6:**

Using Backend logic setup communication with frontend app using Ajax

**Experiment 7:**

1. Create SQL DB and design schema for user session
2. Login using username and password and validate in SQL

**Experiment 8:**

1. Procedure to setup one Hadoop Cluster
2. Access the Hadoop using API’s from the application and show the data

**Experiment 9:**

1. Demonstrate the use of map/reduce using simple program
2. AWS Free Tier Account Creation

**Experiment 10:**

1. In AWS account enabling Multi-Factor Authentication to Secure Your Access and create your First Linux Instance
2. In AWS create your First EC2 windows instance In AWS assign Elastic IP Addresses to Instance (Static IP Address)

**Text Books:**

1. Barrie Sosinsky, “Cloud Computing Bible”, Wiley India Edition.

2. Anthony Velte, tobyVelte, Robert Elsenpeter, “Cloud Computing – A Practical Approach”, Tata McGraw-Hill Edition.

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Describe** the key concepts and technologies in cloud computing. | **PO1, PSO2** |
| **CO2** | **Evaluate** cloud computing technologies and platforms in the context of the needs of a specific application. | **PO2, PO5, PSO2** |
| **CO3** | **Design** data storage components for cloud-based software systems. | **PO5,PSO1** |
| **CO4** | **Assess** and monitor resource use of applications in virtualized environments. | **PO1,PO7, PSO1** |
| **CO5** | **Design, implement, and deploy** cloud applications for current cloud platforms | **PO4, PSO1,PSO3** |
| **CO6** | **Evaluate** privacy and security issues for cloud infrastructure and cloud applications | **PO1,PO3, PO5** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS52253 | Foundation Cloud Computing  Lab | 3 | 1 | 1 | 1 | 1 | - | 1 | - | - | - | - | - | 2 | 2 | 1 |

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

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

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

PAPER TITLE: Foundation of Cloud ComputingLab

PAPER CODE: ECS52253

Maximum Marks: 40 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 8 = 40)** | | | |
| 1. | 1. **Demonstrate** the use of map/reduce using simple program 2. AWS Free Tier Account Creation | **AP** | **CO2** |
| 2. | 1. Procedure to setup one Hadoop Cluster 2. **Access** the Hadoop using API’s from the application and show the data | **U** | **CO3** |
| ­­­ 3. | 1. **Create** SQL DB and design schema for user session 2. Login using username and password and validate in SQL | **U** | **CO4** |
| 4. | 1. Using Backend logic setup communication with frontend app using Ajax 2. **Create** Backend logic to communication with frontend app using Ajax | **U** | **CO5,CO6** |
| 5. | 1. **Design** virtual machine 2. Key based authentication and login virtual machine from the host machine | **AP** | **CO1** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ECS52241** | Web Technology Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Basic Knowledge  of Coding** | | | | |
| **Co-requisites** | **---** | | | | |

**Course Objectives:**

1. To introduce students how to design static webpage using HTML and CSS
2. To provide knowledge on web architecture, web services, client side and server side scripting technologies to focus on the development of web-based information systems and web services
3. To provide skills to design interactive and dynamic web sites
4. To develop students knowledge for implementing web applications using PhP

**Course Outcomes:**

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

CO1:       **Design** a static webpage by applying HTML elements  
CO2:       **Apply** CSS concepts for designing HTML web pages.  
CO3:       **Develop** DHTML pages by using JavaScript with DOM events  
CO4**:       Implement** a webpage with database connectivity using PhP  
CO5:       **Create** rich internet application using XML.

**Catalog Description:**

The main objective of this course is on the World Wide Web as a platform for interactive applications, content publishing and social services. The development of web-based applications requires knowledge about the underlying technology and the formats and standards the web is based upon. In this course you will learn about the HTTP communication protocol, the markup languages HTML, XHTML and XML, the CSS and XSLT standards for formatting and transforming web content, interactive graphics and multimedia content on the web, client-side programming using JavaScript.

**Course Content:**

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

HTML, CSS, Java script, XML and PH

**Experiment 1:**

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

**Experiment 2:**

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

**Experiment 3:**

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

**Experiment 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)

**Experiment 5:**

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

**Experiment 6:**

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

**Experiment 7:**

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

**Experiment 8:**

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

**Experiment 9:**

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

**Experiment 10:**

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

**Experiment 11:**

Write a PHP class that sorts an ordered integer array with the help of sort () function.

**Experiment 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.“Web Design The Complete Reference”, Thomas Powell, Tata McGraw-Hill

2.“Web Design The Complete Reference”, Thomas Powell, Tata McGraw-Hill.

**Reference Books:**

1.“PHP : The Complete Reference”, Steven Holzner, Tata McGraw-Hill The Easy Guide to Operating Systems, Larry Miller, 2012.

2.“Javascript 2.0 : The Complete Reference”, Second Edition By Thomas Powell And Fritz Schneider

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Design** a static webpage by applying HTML elements | **PO3,PO5,PO8,PO12,PSO1** |
| **CO2** | **Apply** CSS concepts for designing HTML web pages | **PO3,PO5,PO8,PO12,PSO1** |
| **CO3** | **Develop** DHTML pages by using JavaScript with DOM events | **PO3,PO5,PO8,PO12,PSO1** |
| **CO4** | **Implemen**t a webpage with database connectivity using PhP | **PO3,PO5,PO8,PO12** |
| **CO5** | **Create** rich internet application using XML | **PO3,PO5,PO8,PO12,PSO1** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  52241 | Web Technology Lab | - | - | 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: MCA Semester: IIICode- ECS52241 Stream- CSETime: 03 Hrs.Paper title– Web Technology Lab Total pages- 1Max. Marks: 40 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)(8 x 5=40)** | | | | |
| 1. | **Develop** the web page for Student database. | | **Ap** | **CO4** |
| 2. | **Define** Imagemap? Design a webpage to display the cricket player’s information using Imagemap. | | **R** | **CO1** |
| ­­­ 3. | **Construct** a webpage for creating a registration form using HTML &CSS. | | **Ap** | **CO4** |
| 4. | **Build** a webpage in such a way that display MCA course Details with Routine | | **Ap** | **CO5** |
| 5. | **Illustrate** the use of <form> tag and action Attribute with an example. | | **U** | **CO1** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ECS52243** | Cyber Security Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours-45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Basic Knowledge  of Coding** | | | | |
| **Co-requisites** | **---** | | | | |

**Course Objectives:**

* To create architectural, algorithmic and technological foundations for the maintenance of the security of individuals.
* To enable the confidentiality of organizations.
* To give the protection of sensitive information.
* To enable students acquire the requirement that information be released publicly or semi-publicly.

**Course Outcomes:**

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

1. **Achieve** Knowledge of web application‘s vulnerability and malicious attacks.
2. **Able** to illustrate different attacking illustrations.
3. **Illustrate** different attacking illustrations.
4. **Analyze** Basic concepts of Attacking Data Stores.

**Catalog Description:**

IT Application & Data Security is an integral part of life. Student will understand the concepts of privacy in today’s environment. Obtain the understanding of how automation is changing the concepts and expectations concerning privacy and the increasingly interconnected issue of security. Obtain the knowledge of the role of private regulatory and self-help efforts. Have an understanding of how emerging issues are affecting society and business, with a concentration on how information security must shape corporate practices.

**Course Content:**

**List of Experiment:**

1. Perform Buffer Overflow operation.
2. Perform DNS Spoofing Attack.
3. Perform ARP Spoofing Attack.
4. Perform Data Packet filtering using Wireshark.
5. Perform Cross Site Scripting Attack.
6. Perform SQL Injection attack.
7. Perform Session Hijacking Attack.

**Text Books:**

1. The Web Application Hacker's Handbook: Finding And Exploiting Security

2. Defydd Stuttard, Marcus Pinto Wiley Publishing, Second Edition.

**Reference Books:**

1. Professional Pen Testing for Web application, Andres Andreu, Wrox Press.
2. Carlos Serrao, Vicente Aguilera, Fabio Cerullo, ―Web Application Security‖ Springer; 1st Edition
3. Joel Scambray, Vincent Liu, Caleb Sima ,―Hacking exposed‖, McGraw-Hill; 3rd Edition, (October, 2010).
4. OReilly Web Security Privacy and Commerce 2nd Edition 2011.

5. Software Security Theory Programming and Practice, Richard sinn, Cengage Learning.

6. Database Security and Auditing, Hassan, Cengage Learning.

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Achieve** Knowledge of web application‘s vulnerability and malicious attacks. | **PO2** |
| **CO2** | **Able** to illustrate different attacking illustrations. | **PO2** |
| **CO3** | **Illustrate** different attacking illustrations. | **PO5** |
| **CO4** | **Analyze** Basic concepts of Attacking Data Stores. | **PO2** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  52243 | Cyber Security Lab | - | 3 | - | - | 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: MCA Semester: III Stream: CSE

PAPER TITLE: Cyber Security Lab PAPER CODE: ECS52243

Maximum Marks: 40 Time duration: 3 hours

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

|  |  |  |  |
| --- | --- | --- | --- |
| **Section A (Answer All the Questions) (5 x 8 = 40)** | | | |
| 1. | **Write** the algorithm of Injecting into Interpreted Contexts. | **Ap** | **CO1** |
| 2. | **Examine**HTTP Requests and HTTP Responses. | **Ap** | **CO2** |
| 3. | **Describe** Server-Side Technologies in details. | **U** | **CO6** |
| 4. | **Describe** with Example Handling User Access Authentication. | **U** | **CO3, CO4** |
| 5. | **Examine**HTTP Requests and HTTP Responses. | **Ap** | **CO2** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ECS52241** | Project -I | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Basic Knowledge  of Coding** | | | | |
| **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 Viva voce)

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **-** | **-** | **-** | **100** |

**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, PO7,PO9, PSO2** |
| **CO4** | **Plan** a projects involving both technological aspects and finance | **PO3,PO7,PO9,PO10** |
| **CO5** | **Identify** newer areas of in depth study and research and lifelong learning | **PO7,PO9,PO12,PSO2** |

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|  |  | **Computational Knowledge** | **Problem Analysis** | **Design / Development of Solutions** | **Conduct Investigations of Complex Computing Problems** | Modern Tool Usage | **Professional Ethics** | **Life-long Learning** | **Project Management and Finance** | **Communication Efficacy** | **Societal & Environmental Concern:** | **Individual & Team Work** | **Innovation and Entrepreneurship** | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  52441 | Project -I | 1 | 2 | 3 | - | - | - | 3 | - | 3 | 1 | - | 1 | 2 | 2 | - |

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

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| **ECS52157** | Elective Course – III (Game Design) | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hours- 45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Computer Graphics** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To understand of the game design phase of process of game production.
* To develop soft skills required for game designers.
* To incorporate game idea creation.
* To enable mechanics and gameplay elaboration.
* 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 design and development.

CO2. **Apply** the mathematics used in game design.

CO3. **Practice** animation production and creation tools.

CO4. **Select** and evaluate programming and scripting languages to design particular games.

CO5.**Classify** 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:**

**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, 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 Playtesting, 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** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

**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, PO3, PSO3** |
| **CO2** | **Apply** the mathematics used in game design. | **PO1,PO3** |
| **CO3** | **Practice** animation production and creation tools. | **PO3, PO4** |
| **CO4** | **Select** and **evaluate** programming and scripting languages to design particular games. | **PO1, PSO1** |
| **CO5** | **Classify** The development of critical thinking, quantitative reasoning, written, and oral communication. | **PO5, PSO1, PSO2,PO1** |

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|  |  | **Computational Knowledge** | **Problem Analysis** | **Design / Development of Solutions** | **Conduct Investigations of Complex Computing Problems** | Modern Tool Usage | **Professional Ethics** | **Life-long Learning** | **Project Management and Finance** | **Communication Efficacy** | **Societal & Environmental Concern:** | **Individual & Team Work** | **Innovation and Entrepreneurship** | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  52157 | Elective Course – III (Game Design) | 3 | - | 2 | 1 | 1 | - | - | - | - | - | - | - | 2 | 1 | 1 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

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

PAPER TITLE: Elective Course – III (Game Design)

PAPER CODE: ECS52157

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, 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. | **U** | **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. | **An** | **CO1** |
| 12. | **Describe** the following: i) Players and ii) Conflict | **C** | **CO4** |

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| **ECS52142** | Public Blockchain-Ethereum | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours-45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Crypto currency and computer security basics** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To gain knowledge about the building blocks of blockchain ethereum.
* To enable students to install and configure Mist browser,
* To give the students a perspective to learn the basics of EVM and Solidity programming.
* To enable students acquire knowledge about smart contract and tokens..

**Course Outcomes:**

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

CO1**. Understand** the basics of blockchain ethereum.

CO2**. Explain** the procedure of installation of Mist browser and its configuration.

CO3**. Explain** the role of Ethereum protocol in Banking.

CO4**. Understand** the basics of Solidity programming primer.

CO5**. Understand** the utility of smart contract and token.

CO6**. Evaluate** the ancestry of blocks and transactions.

**Catalog Description:**

This course is the definitive introduction to permissioned blockchain for the students. Beyond the technology, this course will introduce you to some of the philosophy behind decentralization and why there is so much excitement around it.

During the tenure of the course, the students will be introduced to blockchain and the technology behind it. In the later modules, the topics beyond bitcoin will be taken up and delve deeper into a next-generation blockchain called Ethereum to introduce students to what modern blockchains can do.

**Course Content:**

**Unit I: 6 lecture hours**

**Bridging the Blockchain Knowledge Gap**: What Ethereum Does, Three Parts of a Blockchain, Ether as a Currency and Commodity , The Power Is in the Protocol , You Can Build Trustless Systems, What Smart Contracts: Objects and Methods for Value , Just Add Commerce ,Content Creation; Where’s the Data? : What Is Mining? , Ether and Electricity Prices; EVM:The Mist Browser , Browser vs. Wallet or Keychain; What Ethereum Is Good For : State of Smart Contract Development Today, A Note to New Programmers : Ethereum Is Free and Open Source , The EVM Is Here to Stay ; What You Can Build Today : Private and Public Chains , The Promise of Decentralized Databases, What’s Next: New Ways of Working

**Unit II: 8 lecture hours**

**The Mist Browser:** introduction, The Bank Teller Metaphor , In Cryptocurrency, You Hold Your Own Assets , Visualizing Ethereum Transactions, Breaking with Banking History , How Encryption Leads to Trust, System Requirements , More about Eth.guide and This Book, Tools for Developers, CLI Nodes, Recommended: Using Parity with Geth, Finally, into the Mist! , Downloading and Installing Mist, Configuring Mist, Finding Your New Address, Sending and Receiving Ether, Understanding Ethereum Account Types, Backing Up and Restoring Your Keys, Using Paper Wallets, Using Mobile Wallets, Working with Messages and Transactions, So, What Is a Blockchain? , Paying for Transactions, Understanding Denominations, Getting Ether, Anonymity in Cryptocurrency, Blockchain Explorers .

**Unit III: 8 lecture hours**

**The EVM:**  The Role of the Ethereum Protocol in Banking , What the EVM Does, EVM Applications Are Called Smart Contracts, The Name “Smart Contracts” , Understanding State Machines , Digital vs. Analog, “Statements” , Data’s Role in State , How the Guts of the EVM Work, The EVM Constantly Checks for Transactions, Creating a Common Machine Narrative of What Happened, Cryptographic Hashing , Hash Functions (or Hash Algorithms), Blocks: The History of State Changes, Block Time, Drawbacks of Short Blocks, “Solo Node” Blockchain , Distributed Security, Mining’s Place in the State Transition Function , Renting Time on the EVM , Gas : Why Is Gas So Important?, Why Isn’t Gas Priced in Ether?, Fees as Regulation , Working with Gas , Gas Specifics, How Gas Relates to Scaling the System, Accounts, Transactions, and Messages, Externally Owned Accounts , Contract Accounts , Transactions and Messages, Characteristics of Transactions , Characteristics of Messages , Estimating Gas Fees for Operations , Opcodes in the EVM .

**Unit IV: 8 lecture hours**

Solidity Programming Primer: Global Banking Made (Almost) Real, Extra-Large Infrastructure, Worldwide Currency? , Complementary Currency, The Promise of Solidity, Browser Compiler, Learning to Program the EVM , Easy Deployment, The Case for Writing Business Logic in Solidity, Code, Deploy, Relax, Design Rationale , Writing Loops in Solidity, Expressiveness and Security, The Importance of Formal Proofs, Historical Impact of a Shared Global Resource , How Attackers Bring Down Communities, Hypothetical Attack Written in Solidity , Automated Proofs to the Rescue?, Determinism in Practice , Lost in Translation, Testing, Testing, Testing, Command Line Optional! , Formatting Solidity Files, Tips for Reading Code, Statements and Expressions in Solidity, What Is an Expression? What Is a Statement? , Functions, Public and Private , Value Types, Booleans, Signed and Unsigned Integers, Addresses, Members of Addresses, Address-Related Keywords , Less-Common Value Types , Complex (Reference) Types , Global Special Variables, Units, and Functions, Block and Transaction Properties , Operators Cheat Sheet, Global Functions, Exceptions and Inheritance .

**Unit V: 7 lecture hours**

**Smart Contracts and Tokens**: EVM as Back End, Smart Contracts to Dapps, Assets Backed by Anything , Bartering with Fiat Currency, Ether as Glass Beads, Cryptocurrency Is a Measure of Time, Asset Ownership and Civilization , Coins are Collectibles , The Function of Collectibles in Human Systems , Early Counterfeiting, Jewelry and Art as Money , The Step Toward Banknotes , Platforms for High-Value Digital Collectibles , Tokens Are a Category of Smart Contract , Tokens as Social Contracts, Tokens Are a Great First App, Creating a Token on the Testnet , Getting Test Ether from the Faucet, Registering Your Tokens , Deploying Your First Contract, Same House, Different Address , Playing with Contracts .

**Unit VI: 8 lecture hours**

**Mining Ether**: Ether’s Source, Mining , Self-Regulation, and the Race for Profit , How Proof of Work Helps Regulate Block Time , What’s Going on with the DAG and Nonce?, Making Fast Blocks Work , How Ethereum Uses Stale Blocks , Uncle Rules and Rewards, The Difficulty Bomb, Miner’s Winning Payout Structure , Limits on Ancestry, The Block Processing Play by Play , Evaluating the Ancestry of Blocks and Transactions, How Ethereum and Bitcoin Use Trees , Merkle-Patricia Trees, Contents of an Ethereum Block Header, Forking , Installing Geth on macOS , Installing Geth on Windows , Getting Comfortable with the Command Line, Installing Geth on Ubuntu 14.04 , Executing Commands in the EVM via the Geth Console, Launching Geth with Flags, Fire Up Your Miner! , Mining on the Testnet, GPU Mining Rigs, Mining on a Pool with Multiple GPUs.; use Cases: Chains Everywhere, The Internet of Ethereum Things, Retail and E-Commerce, Community and Government Financing, Human and Organizational Behavior, Financial and Insurance Applications, Inventory and Accounting Systems, Software Development, Gaming, Gambling, and Investing.

**Text Books:**

1.Mayukh Mukhopadhyay - Ethereum smart contract development\_ build blockchain-based decentralized applications using Solidity-Packt Publishing (2018)

2.Chris Dannen (auth.) - Introducing Ethereum and Solidity\_ Foundations of Cryptocurrency and Blockchain Programming for Beginners-Apress (2017)

3.Mastering Bitcoin: Programming The Open Blockchain, Andreas M. Antonopoulos, O'Reilly, ISBN: 9789352135745.

**Reference Books:**

1.Ethereum for Architects and Developers: With Case Studies and Code Samples in Solidity by Debajani Mohanty

2.Blockchain for Business by Jai Singh Arun

3.Blockchain Applications: A Hands-on Approach by Arshdeep Bahga and

Vijay K. Madisetti, ISBN: 9780996025560.

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

**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 blockchain ethereum. | **PO1,PO2,PO3** |
| **CO2** | **Explain** the procedure of installation of Mist browser and its configuration. | **PO2,PO1,PO3** |
| **CO3** | **Explain** the role of Ethereum protocol in Banking. | **PO3,PO1,PO2** |
| **CO4** | **Understand** the basics of Solidity programming primer. | **PO4,PO5** |
| **CO5** | **Understand** the utility of smart contract and token. | **PO2,PO3** |
| **CO6** | **Evaluate** the ancestry of blocks and transactions. | **PO4,PO6** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS52142 | Public Blockchain-Ethereum | 3 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

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

PAPER TITLE: Public Blockchain-Ethereum PAPER CODE: ECS52142

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, 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 three parts of a blockchain. | **U** | **CO1** |
| 2. | **Enumerate** the steps of installation of Mist browser. | **U** | **CO2** |
| ­­­ 3. | **Define** mining. | **R** | **CO3** |
| 4. | **What** is EVM? | **R** | **CO4** |
| 5. | **Define Smart contract.** | **R** | **CO5** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Describe** the characteristics of cryptocurrency | **U** | **CO1** |
| 7. | **Examine** the ancestry of blocks and transactions. | **An** | **CO6** |
| 8. | **Explain** the historical impact of a shared global resource. | **U** | **CO4** |
| 9. | **Explain** Ethereum protocol in banking. | **U** | **CO3** |
|  | **SECTION C(Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Explain** any two use cases of Internet of Ethereum things. | **U** | **CO4** |
| 11. | **Write** short notes on Ethereum transactions. | **U** | **CO2** |
| 12. | **Distinguish** between private and public chain. | **An** | **CO1** |

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| **HPS44101** | HSS-VI(Basics of Organizational Behaviour) | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours-45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **Organization evolution at basic level of social study** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To help the student to acquire knowledge of organization evolution process.
* To enable students modelling organization project with appropriate metric and precision at workplace.
* To give the students a perspective to organization design process variables by exposing them to organization specification document.
* To enable students, acquire testing and quality assessment of organization model required for their profession.

**Course Outcomes:**

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

CO1**. Understand** the impact of organizational behaviour.

CO2. **Communicate** with proper organizational model paradigm to pupils.

CO3**. Enhancement** of organizational metric engineering application in industry.

CO4. **Effectively** analyse organization and maintenance of project.

CO5. **Illustrate** organizational metric analysis for an effective model.

**Catalog Description:**

There is a growing need for talented organizational developers across every industry. As technology advances, the ability to build quality organisation while considering design, development, security, and maintenance is sought after amongst all kinds of companies, from finance and banking to healthcare and national security.

Organisational behaviour applies the knowledge and theoretical understanding gained through behavioural science to building high-quality products in organisation. As a maturing discipline, Organisational behaviour is becoming more and more important in our everyday lives.

**Course Content:**

**5 Lecture Hour**

**Module 1:** Introduction: Historical development; concept of organization; elements of organizational structure; scope of organizational behaviour.

**8 Lecture Hour**

**Module 2:** Motivation and job satisfaction: Major theories; content and process; (Adams, Maslow, Vroom, Herzberg). Intrinsic and extrinsic motivation; incentive systems - Job satisfaction; concept and determinants.

**8 Lecture Hour**

**Module 3:** Leadership: Functions and approaches; trait, behavioural and contingency models; characteristics of successful leaders; role of power in leadership.

**8 Lecture Hour**

**Module 4:** Communication: Communication process- types of communication; communication channels and networks; barriers to communication.

**8 Lecture Hour**

**Module 5:** Group behavior and conflict: Defining and classifying groups; stages of group development; concept, causes and consequences of conflicts; methods of conflict-resolution.

**8 Lecture Hour**

**Module 6:** Behavior in organizations: Human perception and motivation, human learning and problem solving, people are unique, groups in organizations, leader and group effectiveness

**Text Books:**

1. Aamodt, M. G. (2001). Industrial/organizational psychology. New Delhi: Cengage
2. Muchincky. (2009). Psychology applied to work. New Delhi: Cengage.

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Class Assessment** | **Mid Term** | **End Term** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

**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 organizational behaviour. | **PO1, PO11,PO7,PO10** |
| **CO2** | **Communicate** with proper organizational model paradigm to pupils. | **PO1, PO2, PO3, PO4, PO5, PO11, PSO1, PSO2** |
| **CO3** | **Enhancement** of organizational metric engineering application in industry. | **PO1, PO5, PO12, PSO2** |
| **CO4** | **Effectively** analyse organization and maintenance of project | **PO1, PO6, PO8, PO9, PO12, PSO3** |
| **CO5** | **Illustrate** organizational metric analysis for an effective model. | **PO1, PO6, PO8, PO9, PO12, PSO2,PO12** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| HPS  44101 | HSS-IV(Basics of Organizational Behaviour) | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 3 | 2 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

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

PAPER TITLE: HSS –IV (Basics of Organizational Behaviour) PAPER CODE: HPS44101

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. | **List** the steps involved in organizational structure? Write a note on it. | **U** | **CO1** |
| 2. | **Enumerate** the basic elements of organizational behaviour requirement specification. | **U** | **CO2** |
| ­­­ 3. | **Define** leader ship strategy. | **R** | **CO3** |
| 4. | **What** is group behavior? | **R** | **CO4** |
| 5. | **Give** the principles of conflict management. | **U** | **CO4** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Describe** the stages of evolutionary organization model? | **U** | **CO1** |
| 7. | **Examine** the essential phases of communication channels and networks? | **Ap** | **CO2** |
| 8. | **Elucidate** the barriers to communication with suitable example. | **Ap** | **CO3** |
| 9. | **Explain** incentive system with proper example? | **Evaluate** | **CO4 /CO2** |
|  | **SECTION C (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | **Explain** in detail about Intrinsic and extrinsic motivation | **U** | **CO4** |
| 11. | **Write** a Project estimation technique and estimation issues in project progress line.?Explain with a Case Study | **Create** | **CO4** |
| 12. | **Distinguish** features of the factors i) behavioral and contingency models, ii)Leadership strategy? | **An** | **CO5** |

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| **MBA 52180** | Project Management | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours-45** | **3** | **0** | **0** | **3** |
| **Pre-requisites/Exposure** | **The participants should have knowledge of Operations Management and Basic knowledge of Accounting** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To make them understand the concepts of Project Management for planning to execution of projects.
* To make them understand the feasibility analysis in Project Management and network analysis tools for cost and time estimation.
* To enable them to comprehend the fundamentals of Contract Administration, Costing and Budgeting.
* Make them capable to analyze, apply and appreciate contemporary project management tools and methodologies in Indian context.

**Course Outcomes:**

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

CO1**. Understand** the concept of Project Management.

CO2**. Illustrate** and **explain** the steps involved in implementation of Projects.

CO3**. Understand** how the project management organization performs.

CO4. **Construct** and **solve** the PERT and CPM related problems of Project Management.

CO5**. Explain** how project execution and quality control can be done.

**Course Description:**

This course will introduce project management. This course will equip the students to various feasibility analyses – Market, Technical, Financial and Economic. To equip them with the knowledge and skills required to be successful in applying Project Management. To make them understand techniques for Project planning, scheduling and Execution Control. Lectures the focus will be on quizzes, group projects and case studies. Students are encouraged to work on live projects on various topics related to oil and gas sector. Students are developed to get exposure to Subcontract Administration and Control are practiced in Oil and Gas sector mainly downstream/retail.

**Course Content:**

**Unit I: Introduction 9 lecture hours**

Introduction to Project Management, Need and Scope of Project Management, Project Management Process, Project Life Cycle, Impact of various factors of Project, Project Management Principles.

**Unit II: Project Implementation 9 lecture hours**

Process of Identifying Projects, Initiation, Project Feasibility Studies, Calculating Break Even and its implementation.

**Unit III: Project Organization 9 lecture hours**

Concept of Project Organization Structure, Roles and Responsibilities of a Project Leader, Line and Staff Relationship, Leadership Styles of Project Managers, Team and Diversity Management.

**Unit IV: PERT and CPM 9 lecture hours**

Development of Project Network, Critical Path Analysis, Crashing of Project, Risk Management,

**Unit V: Project Execution and Quality Control 9 lecture hours**

Project Quality Management, Performance Measurement, Project Close Out, Project Termination, and Introduction to different Project Management Software.

**Text Books:**

1. Prasanna Chandra; Projects- Planning, Analysis, Selection, Financing, Implementation and Review’, VI Edition, Tata Mc Graw Hill, 8th Edition 2015.

2. Gopalakrishnan P., Ramamoorthy V.E; Textbook of Project Management, MacMillan Publishers.

**Reference Books:**

1. Meredith Jack R., Mantel Samuel J.; Project Management, IV Edition, John Wiley & Sons

2. Patel Bhavesh M.; Project Management- Strategic Financial Plannisng, Education & Control, Vikas Pub. House, 2014

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Understand** the concept of Project Management. | **PO1, PO11, PSO1** |
| **CO2** | **Illustrate** and **explain** the steps involved in implementation of Projects. | **PO1, PO9, PO11, PO12** |
| **CO3** | **Understand** how the project management organization performs. | **PO6, PO8, PO11, PO12** |
| **CO4** | **Construct** and **solve** the PERT and CPM related problems of Project Management. | **PO1, PO2, PO3, PO4, PO5, PO9, PO11, PO12, PSO2** |
| **CO5** | **Explain** how project execution and quality control that can be done. | **PO1, PO2, PO9, PO11, PO12** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| MBA  52180 | Project Management | 3 | 2 | 2 | 2 | 3 | 1 | - | 2 | 2 | - | 3 | 3 | 2 | 1 | - |

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

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2021**

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

PAPER TITLE: Project Management PAPER CODE: MBA52180

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. | **Define** Project Management. | **U** | **CO1** |
| 2. | **Define** Break Even. | **U** | **CO2** |
| ­­­ 3. | **Define** Line and Staff Functions | **U** | **CO3** |
| 4. | **Define** Total Float. | **U** | **CO4** |
| 5. | **Define** Kaizen. | **U** | **CO5** |
|  | **SECTION B (**Attempt any **Three Questions) (3 x 5 = 15)** |  | |
| 6. | **Compare** Greenfield project from Brownfield project. Illustrate. | **A** | **CO1** |
| 7. | **Discuss** the merits and demerits of Gantt Chart. | **C** | **CO2** |
| 8. | **Discuss** the methods of Project Appraisal. | **C** | **CO5** |
| 9. | **Explain** the Break Even Point with suitable example. | **E** | **CO4** |
|  | **SECTION (Answer Any Two Questions) (2 x 10 = 20)** |  | |
| 10. | Following details are available for a particular project –   |  |  |  | | --- | --- | --- | | **Activity** | **Immediate Predecessor** | **Duration (Weeks)** | | A |  | 1 | | B | A | 4 | | C | A | 3 | | D | B | 2 | | E | C, D | 5 | | F | D | 2 | | G | F | 2 | | H | E, G | 3 |   a) Calculate the total duration of the project.  b) **Lis**t all Critical Activities.  c) Calculate Total Float and Free Float of each activity. | **AP, A** | **CO4** |
| 11. | You are on to launch a new Software Company. **List** all the feasibility study issues that you will be going to analyze. | **A** | **CO2** |
| 12. | **Compare** between NPV and ROI. Which one you will favor and why? | **E** | **CO3** |

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| --- | --- | --- | --- | --- | --- |
| **ECS52257** | Elective Course – III Lab (Game Design Lab using CONSTRUCT) | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Computer Graphics** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To help the student to comprehend of the game design phase of process of 3d game production.
* To develop soft skills required for game designers.
* To incorporate game idea creation.
* To enable mechanics and gameplay elaboration.
* 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.Apply** techniques and methods in the production of a diverse portfolio of industry-standard game-art animation assets, game prototypes ad documents.

**CO2**. Implement game assets to execute the production of a game within a team setting.

**CO3.Apply** the appropriate skills necessary for proper project production planning and management of computer and video games.

**CO4.Deploy** technology as a discipline, understanding its relationship to other disciplines and its implications and impact on the individual, society and the future.

**CO5.** The **development** of critical thinking, quantitative reasoning, written, and oral communication.

**Catalog Description:**

This course is an introduction to the primary concepts of gaming, and an exploration of how these basic concepts affect the way gamers interact with our games. In this course you will understand what defines a “game” and the mechanics and rules behind different types of games. Through four linked assignments you'll learn ways to create and describe a game concept, and specifically what makes a compelling game. This course focuses on the conceptual underpinnings of games, and all assignments can be completed with a pencil and paper – no previous programming knowledge is required.

**Course Content:**

**Unit I: 8 lecture hours**

**Module 1:**

Introduction: Games Overview; History of Computer Games. Definition of Computer Games and overview of Game Genre.

The Role of Game Designer: Passion and Skills, A Play centric design process, Designing for Innovation. Designer’s perspective.

**Unit II: 11 lecture hours**

Game Platform and Genres: Game Platforms, Console, PC; Mobile, etc. Game Development Cycle and Production Team, Game Genres I; Strategy in Video Games, Game Genres II

**Basics of Machine Learning:** Learning Topologies: Training-Testing-Validation; Error: Actual Output; Target Output; Error Optimization: Gradient Descent (SGD, Minibatch); Parameter Update; Dataset and cleaning, Normalization; Bias and Variance; Hypothesis Testing;

**Unit III: 10 lecture hours**

Game Structure: Layers of Game Design, Design Issues, Pre-production and Documentation, Design Trade-offs.

Working with Formal Elements: Players, Objectives, Procedures, Resources, Conflict, Boundaries

Working with Dramatic Elements: Premise, Character, Story, World Building; The Dramatic Arc.

**Unit IV: 9 lecture hours**

**Prototype**: Digital Prototyping; Types, Designing Controls Schemes, Selecting Viewpoints, Effective Interface Design, Tools for prototyping.

**Testing**: Test Design and Iterative Design, Methods of Playtesting, The Play Matrix, Basic Usability Techniques, Data Gathering and Test Control Situation.

**Unit V: 7 lecture hours**

**Game Ethics and Social Communication**: Legalities of Game Development, Ethics, Culture, Violence in Games, Responsibilities, and ESRB Ratings

Competitive Analysis (SWOT): Understanding the Company, Market Analysis: Understanding the Customer; Games Marketing and Distribution, Industry Roles and Careers, Salary Survey and Quality of Life, Future of Video Games.

**Text Books:**

1.Artificial Intelligence – A Modern Approach, Second Edition, S. Russel and P. Norvig Pearson Education, 2003.

2.Artificial Intelligence, Ritch& Knight, TMH

3.“Machine Learning”, 1st Edition, Tom M. Mitchell, McGraw-Hill Series In Computer Science

4.“Neural Networks and Learning Machines”, 3rd Edition, Simon O. Haykin, Prentice Hall

5.“Introduction to Machine Learning”, 2nd Edition, Ethem Alpaydın, The MIT Press

**Reference Books:**

1.Artificial Intelligence; Structures for Complex Problem Solving, Fourth edition, G. Lugar, Pearson Education, 2002

2.Artificial Intelligence: A New Synthesis, Nils J. Nilsson, Morgan Kaufmann Publishing, Inc., Year 1998

3.“INTRODUCTIONTOMACHINE LEARNING”, 2005 Edition, Nils J Nillsson, Morgan Kaufmann

4.“Foundations of Machine Learning”, 2012 Edition, Mehryar Mohri, Afshin Rostamezadeh, Ameet Talwalkar, The MIT Press

5.“Python Data Science Handbook Essential Tools for Working with Data”, 1st Edition, Jake Vander Plas, O’Reilly

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Apply t**echniques and methods in the production of a diverse portfolio of industry-standard game-art animation assets, game prototypes ad documents. | **PO1, PO2, PSO3** |
| **CO2** | I**mplement** game assets to execute the production of a game within a team setting | **PO1, PO3** |
| **CO3** | **Apply** the appropriate skills necessary for proper project production planning and management of computer and video games. | **PO3, PO4** |
| **CO4** | **Deploy t**echnology as a discipline, understanding its relationship to other disciplines and its implications and impact on the individual, society and the future. | **PO1, PO5, PO12, PSO1** |
| **CO5** | The **development** of critical thinking, quantitative reasoning, written, and oral communication. | **PO2, PO5, PSO1, PSO2** |

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|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS52257 | Elective Course – III Lab (Game Design Lab using CONSTRUCT) | 3 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | 1 | 2 | 1 | 1 |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

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

PAPER TITLE: Elective Course – III Lab (Game Design Lab using CONSTRUCT)

PAPER CODE: ECS52257

Maximum Marks: 40 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 8 =40)** | | | |
| 1. 4. | **Design** characters. | **Ap** | **CO2** |
| 1. 5. | **Design** of various gaming constraints. | **Ap** | **CO2** |
| 1. 6. | **Design** a TIC-TAC-TOE Game interface. | **Ap** | **CO3** |
| 1. 7. | **Design** frame. | **Ap** | **CO4** |
| 1. 8. | **Design** a ghost, shooter demo game in Construct by adding event. | **Ap** | **CO2** |

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| --- | --- | --- | --- | --- | --- |
| **ECS52242** | Public Blockchain-Ethereum Lab | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact Hours -45** | **0** | **0** | **3** | **2** |
| **Pre-requisites/Exposure** | **Crypto currency and computer security basics** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To gain knowledge about the building blocks of blockchain ethereum.
* To enable students to install and configure Mist browser,
* To give the students a perspective to learn the basics of EVM and Solidity programming.
* To enable students acquire knowledge about smart contract and tokens..

**Course Outcomes:**

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

CO1**. Understand** the basics of Solidity programming.

CO2**. Apply** the decision making constructs and loops to perform conditional execution.

CO3**. Apply** the various types of inheritance in Solidity programming.

CO4**. Distinguish** between function and contract polymorphism.

CO5**. Explain** and apply error handling use cases.

**Catalog Description:**

This course is the definitive introduction to permissioned blockchain for the students. Beyond the technology, this course will introduce you to some of the philosophy behind decentralization and why there is so much excitement around it.

During the tenure of the course, the students will be introduced to blockchain and the technology behind it. In the later modules, the topics beyond bitcoin will be taken up and delve deeper into a next-generation blockchain called Ethereum to introduce students to what modern blockchains can do.

**Course Content:**

**Experiments:**

|  |  |
| --- | --- |
| 1 | Write a Solidity program to create a smart contract. |
| 2 | Solidity program to demonstrate the use of decision making statements. |
| 3 | Solidity program to demonstrate the use of loops. |
| 4 | Solidity program to demonstrate the creation of an event. |
| 5 | Solidity program to demonstrate the use of pure and view functions. |
| 6 | Solidity program to demonstrate the use of different types of inheritance. |
| 7 | Solidity program to demonstrate the use of abstract contract. |
| 8 | Solidity program to demonstrate the use of Function polymorphism. |
| 9 | Solidity program to demonstrate the use of contract polymorphism. |
| 10 | Solidity program to demonstrate the error handling. |

**Text Books:**

1.Mayukh Mukhopadhyay - Ethereum smart contract development\_ build blockchain-based decentralized applications using Solidity-Packt Publishing (2018)

2.Chris Dannen (auth.) - Introducing Ethereum and Solidity\_ Foundations of Cryptocurrency and Blockchain Programming for Beginners-Apress (2017)

3.Mastering Bitcoin: Programming The Open Blockchain, Andreas M. Antonopoulos, O'Reilly, ISBN: 9789352135745.

**Reference Books:**

1.Ethereum for Architects and Developers: With Case Studies and Code Samples in Solidity by Debajani Mohanty

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

**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 Solidity programming. | **PO1,PO2,PO3** |
| **CO2** | **Apply** the decision making constructs and loops to perform conditional execution. | **PO2,PO1,PO3** |
| **CO3** | **Apply** the various types of inheritance in Solidity programming. | **PO3,PO1,PO2** |
| **CO4** | **Distinguish** between function and contract polymorphism | **PO4,PO5** |
| **CO5** | **Explain** and apply error handling use cases. | **PO2,PO3** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS52242 | Public Blockchain-Ethereum Lab (Elective – III Lab) | 3 | 3 | 3 | 1 | 1 | - | - | - | - | - | - | - | - | - | - |

1=weakly mapped

2= moderately mapped

3=strongly mapped

**Model Question Paper**

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING AND TECHNOLOGY**

**END-SEMESTER EXAMINATION: JULY 2020**

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

PAPER TITLE: Public Blockchain-Ethereum Lab PAPER CODE: ECS52242

Maximum Marks: 40 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. | **Develop** a Solidity program to create a smart contract. | **AP** | **CO1** |
| 2. | **Develop** Solidity program to demonstrate the use of decision making statements. | **AP** | **CO2** |
| ­­­ 3. | **Develop** Solidity program to demonstrate the use of loops. | **AP** | **CO2** |
| 4. | **Develop** Solidity program to demonstrate the creation of an event. | **AP** | **CO4** |
| 5. | **Develop** Solidity program to demonstrate the error handling. | **AP** | **CO5** |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ECS52342** | Seminar | **L** | **T** | **P** | **C** |
| **Version 1.0** | **Contact hour -30** | **0** | **2** | **0** | **2** |
| **Pre-requisites/Exposure** | **Knowledge on Computer domain** | | | | |
| **Co-requisites** | **--** | | | | |

**Course Objectives:**

* To **develop** skills in doing literature survey, technical presentation and report preparation.
* To **enable** project identification and execution of preliminary works on final semester project

**Course Outcomes:**

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

CO1. **Identify** the advanced technologies and globalization

CO2. **Develop** communication and representation skills towards becoming a good team leader and

manager

CO3. **Plan** for lifelong learning towards industry readiness

CO4. **Build** the ability to identify an engineering problem, analyze it and propose a work plan to

solve it.

**Catalog Description:**

The course involves presentation and report submission by every student. Reference search and technical writing skills along with effective presentation skills are focused. The course strengthens the research attributes including literature survey.

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

**Examination Scheme:**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **10** | **30** | **20** | **40** |

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

|  |  |  |
| --- | --- | --- |
| **Mapping between COs and POs** | | |
|  | **Course Outcomes (COs)** | **Mapped Program Outcomes** |
| **CO1** | **Identify** the advanced technologies and globalization | **PO1, PO2, PO3, PSO3** |
| **CO2** | **Develop** communication and representation skills towards becoming a good team leader and manager | **PO7,PO9, PO11, PSO3** |
| **CO3** | **Plan** for lifelong learning towards industry readiness | **PO7,PO9,PO12, PSO3** |
| **CO4** | **Build** the ability to identify an engineering problem, analyze it and propose a work plan to solve it. | **PO2, PO3, PO4, PO5,PO7,PO9,PSO3** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | Computational Knowledge | Problem analysis | Design/development of solutions | Conduct investigations of complex computing problems | Modern tool usage | Professional Ethics | Life-long Learning | Project Management and Finance: | Communication Efficacy | Societal & Environmental Concern: | Individual & Team Work | Innovation and Entrepreneurship | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  52342 | Seminar | 1 | 2 | 2 | 1 | 1 | - | 3 | - | 3 | - | 1 | 1 | - | - | 3 |

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ECS52442** | PROJECT -II | **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 Viva voce)

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

**Examination Scheme:**

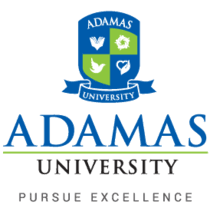
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Components** | **Attendance** | **Internal Assessment** | **MTE** | **ETE** |
| **Weightage (%)** | **-** | **-** | **-** | **100** |

**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,PO7,PSO1** |
| **CO2** | **Utilize** the modern tools to solve the problems | **PO2,PO3,PO10,PSO1** |
| **CO3** | **Discuss** in a group to promote team spirit and leadership quality among the students | **PO1, PO9, PSO2** |
| **CO4** | **Plan** a projects involving both technological aspects and finance | **PO3,PO7,PO9,PO10, PSO1** |
| **CO5** | **Identify** newer areas of in depth study and research and lifelong learning | **PO7,PO9,PO10,PO12,PSO2** |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Computational Knowledge** | **Problem Analysis** | **Design / Development of Solutions** | **Conduct Investigations of Complex Computing Problems** | Modern Tool Usage | **Professional Ethics** | **Life-long Learning** | **Project Management and Finance** | **Communication Efficacy** | **Societal & Environmental Concern:** | **Individual & Team Work** | **Innovation and Entrepreneurship** | Globally expertise the technological planning and development of software applications in the usage of the modern era. | Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare. | Ability to enhance and develop techniques for independent and lifelong learning in computer application. |
| Course Code | Course Title | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
| ECS  52442 | Project -II | 1 | 2 | 3 | - | - | - | 3 | - | 3 | 3 | - | 1 | 3 | 2 | - |

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

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**ADAMAS UNIVERSITY**

**SCHOOL OF ENGINEERING & TECHNOLOGY**

**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**

**CO – PO & PSO MAPPING**

**Name of the Programme: Master of Computer Application (MCA)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| ECS51141 | Computer Programming with Python | 3 | 3 | 3 | 3 | 2 | - | - | - | - | - | 1 | 3 | - | - | 3 |
| SMA51141 | Numerical & Statistical Methods | 3 | 3 | - | 1 | - | - | - | - | - | - | - | - | - | - | 2 |
| ECS 51143 | Computer Organization & Architecture | 3 | 1 | 3 | - | 2 | 3 | - | - | - | - | - | 3 | 3 | 1 | 3 |
| ECS51145 | Software Engineering | 3 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 | 1 | 3 | 1 |
| HEN51129 | HSS I (English Communication) | 3 | 3 | 3 | 1 | 2 | - | 1 | 1 | - | - | - | 1 | - | - | - |
| ECS51147 | Data Structure with Python | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 1 | 3 | - | 1 |
| ECS51241 | Computer Programming with Python Lab | 2 | 3 | 3 | - | - | - | - | - | - | - | - | - | - | - | 3 |
| SMA51241 | Numerical & Statistical Methods Lab | 3 | - | - | - | - | - | - | - | - | - | - | - | - | - | 3 |
| ECS 51243 | Computer Organization & Architecture Lab | 2 | - | 2 | - | 2 | - | - | - | - | - | - | 2 | 2 | 2 | - |
| ECS51247 | Data Structures with Python Lab | 3 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | 3 | 3 | 3 |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| ECS51142 | Mobile application using android/IOS | 1 | 2 | 1 | - | 1 | - | - | - | - | - | - | - | - | - | 1 |
| ECS51144 | Object Oriented Programming with Java | 3 | 3 | 3 | - | - | - | - | - | - | - | - | - | 3 | - | 3 |
| ECS51146 | Operating system | 2 | 2 | 3 | 2 | 3 | - | - | - | - | - | - | - | - | - | - |
| ECS51148 | Database Management Systems | 3 | 3 | 1 | 1 | 1 | - | 1 | - | - | - | - | 2 | 1 | - | 3 |
| SMA51142 | Discrete Mathematics | 3 | 3 | - | - | 1 | - | - | - | - | - | - | - | 2 | 3 | - |
| ECS51242 | Mobile application using android/IOS Lab | 3 | 2 | 1 | 1 | 1 | - | - | - | - | - | - | - | - | - | - |
| ECS51244 | Object Oriented Programming with Java Lab | 3 | 3 | - | 3 | - | - | - | - | - | - | - | - | 3 | - | 3 |
| ECS51246 | Operating System Lab | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | - | 3 | - | - |
| ECS51248 | Database Management Systems Lab | 1 | 1 | 1 | 2 | 1 | - | - | - | - | - | - | - | 1 | 2 | 1 |
| ECS52141 | Web Technology | - | - | 3 | - | 3 | - | - | 3 | - | - | - | 3 | 2 | 3 | - |
| EEC52101 | Data Communication and Computer Network | 1 | 3 | 2 | 3 |  | 1 | - | - | - | - | - | - | 1 | 1 | 1 |
| ECS52143 | Cyber Security | 2 | 1 | 1 | - | 1 | - | - | - | - | - | - | - | - | - | 1 |
| HEN42111 | HSS –III(English Communication) | - | - | - | - | 3 | 3 | - | 1 | - | - | 3 | - | - | - | 2 |
| ECS52145 | Artificial Intelligence and Machine Learning(Elective -I) | 3 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | - | 2 | 1 | 1 |
| ECS52153 | Cloud Computing(Elective -I) | 3 | 1 | 1 | 2 | 2 | - | 1 | - | - | - | - | 1 | 1 | 2 | 1 |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| ECS52147 | Natural Language Processing and Its Applications(Elective -II) | 3 | 3 | 3 | 3 | 3 | - | - | - | - | - | - | - | 3 | - | 3 |
| ECS51150 | Data Warehousing & Data Analytics (Elective -II) | 3 | 2 | - | 1 | 3 | - | 1 | - | - | - | - | - | 1 | 3 | 1 |
| ECS52155 | Cloud Storage (Elective -I) | 1 | 1 | 1 | 2 | - | 1 | 1 | - | - | - | - | 2 | - | 2 | 2 |
| ECS52245 | Artificial Intelligence and Machine Learning Lab(Elective –I Lab) | 1 | 1 | 3 | 1 | 2 | - | - | - | - | - | - | - | 3 | 2 | 1 |
| ECS52253 | Foundation of Cloud Computing(Elective –I Lab) | 3 | 1 | 1 | 1 | 1 | - | 1 | - | - | - | - | - | 2 | 2 | 1 |
| ECS52241 | Web Technology Lab | - | - | 3 | - | 3 | - | - | 3 | - | - | - | 3 | 3 | - | - |
| ECS52243 | Cyber security lab | - | 3 | - | - | 1 | - | - | - | - | - | - | - | - | - | - |
| ECS52441 | Project -I | 1 | 2 | 3 | - | - | - | 3 | - | 3 | 1 | - | 1 | 2 | 2 | - |
| ECS52157 | Elective Course – III (Game Design) | 3 | - | 2 | 1 | 1 | - | - | - | - | - | - | - | 2 | 1 | 1 |
| ECSXXXXX | Public Blockchain-Ethereum | 3 | 3 | 3 | 2 | - | - | - | - | - | - | - | - | - | - | - |
| HPS44101 | HSS-IV(Basics of Organizational Behaviour) | 3 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 3 | 2 |
| MBA52180 | Project Management | 3 | 2 | 2 | 2 | 3 | 1 | - | 2 | 2 | - | 3 | 3 | 2 | 1 | - |
| ECS52257 | Elective – III Lab (Game Design Lab using CONSTRUCT) | 3 | 2 | 2 | 1 | 2 | - | - | - | - | - | - | 1 | 2 | 1 | 1 |
| **Course Code** | **Course Title** | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PreO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** | **PO12** | **PSO1** | **PSO2** | **PSO3** |
| ECS XXXXX | Public Blockchain-Ethereum Lab (Elective – III Lab) | 3 | 3 | 3 | 1 | 1 | - | - | - | - | - | - | - | - | - | - |
| ECS52342 | Seminar | 1 | 2 | 2 | 1 | 1 | - | 3 | - | 3 | - | 1 | 1 | - | - | 3 |
| ECS52442 | Project -II | 1 | 2 | 3 | - | - | - | 3 | - | 3 | 3 | - | 1 | 3 | 2 | - |
| **Average of CO-PO Mapping** | | **2.46** | **2.17** | **2.12** | **1.67** | **1.71** | **1.71** | **1.55** | **2.14** | **2.33** | **1.50** | **2.00** | **1.88** | **2.04** | **2.00** | **1.89** |