Course Name: Cloud Computing

Course Outcome

CO1: Describe importance of virtualization along with their technologies like system, network, and storage virtualizations.
CO2: Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, XaaS, Public Cloud, Private Cloud, Hybrid Cloud and the core issues of cloud computing such as security, privacy, and interoperability.
CO3: Justify the need of new technology of Virtualization & Cloud Computing and its ecological impact.
CO4: Identify the known threats, risks, vulnerabilities and privacy issues associated with Cloud based IT services
CO5: Apply fundamental concepts in cloud infrastructures to understand the tradeoffs in power, efficiency and cost
CO6: Identify the Challenges in managing heterogeneous clouds.
CO7: Analyze various cloud programming models and apply them to solve problems on the cloud.
CO8: Describe the key components of Amazon web Service

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**Mid Term Examination, Odd Semester 2022-23**
**MCA/MSC, 2nd Year, 3rd Semester**
**MCAE0306 - Cloud Computing**

**Time: 2 Hours** **Maximum Marks: 30**

Attempt All Questions: -

**Section – A**

*Attempt **All** Questions* 3 X 5 = 15 Marks

| No. | Detail of Question | Marks | CO | BL | KL |
|---|---|---|---|---|---|
| 1 | Imagine that you are running a website that is subject to wide fluctuations in demand, such as a ticket-selling system for events. How would you plan for migrating the system from traditional to cloud? | 3 | 2 | U | C |
| 2 | Outline the computing platforms and technologies for the development of cloud computing applications. | 3 | 2 | R | C |
| 3 | Discuss the various business drivers for adopting Cloud Computing. | 3 | 2 | A | F |
| 4 | Outline the various deployment models of cloud with neat sketch and identify which among them could be applied to formulate cloud structure for a small firm. | 3 | 3 | An | C |
| 5 | As per the NIST, define Cloud Computing. How utility computing benefits user? | 3 | 2 | R | F |

**Section – B**

*Attempt **All** Questions* 5 X 3 = 15 Marks

| No. | Detail of Question | Marks | CO | BL | KL |
|---|---|---|---|---|---|
| 6 | You are a member of a 4 - member project team. During the Covid time, all the members are struck in their native places. With no means of physical meeting, your project has come to a halt. Give the solution how cloud services can help you and your team in this pandemic time. | 5 | 1 | U | C |
| 7 | Explain the different phenomenon that has gained an interest towards virtualization technologies. | 5 | 2 | R | C |
| 8 | Illustrate "Infrastructure as a Service Offerings". Also Give examples of IaaS Vendors and PaaS vendors | 5 | 2 | An | F |

| | | | | | |
|---|---|---|---|---|---|
| 8 | Following is the training data for a group of athletes. Based on this data, use K-NN algorithm and classify Sayan (Weight = 56 Kg, Speed = 10 kmph) as Good, Average, or Poor sprinter. Solve it for both **K=3** and **K=5**. | 5 | 2 | A | P |

| **Name** | **Weight (Kg)** | **Speed (kmph)** | **Class** |
|---|---|---|---|
| Nitesh | 55 | 9 | Average |
| Gurpreet | 58 | 8 | Poor |
| Goutam | 60 | 7.5 | Poor |
| Gulshan | 59 | 8.5 | Average |
| Mohit | 57 | 10 | Good |
| Sahil | 53 | 10.5 | Good |
| Samyak | 53 | 10 | Good |

Course Name: Machine Learning

Course Outcome

CO1- Understand the basic concepts of machine learning.
CO2- Apply the concepts of regression, classification, and re-sampling methods
CO3- Design supervised and re-enforcement learning based solution.
CO4- Apply the ensemble methods for improving classification.
CO5- Identify the ways of feature extraction, reduction, and selection.

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# Mid Term Examination, Odd Semester 2022-23
## MCA/MSc(Maths), II-Year, III-Semester
## MCAE 0202: Machine Learning

**Time: 2 Hours** **Maximum Marks: 30**

Instruction for students:

- *This paper is divided into two sections: **A** and **B**. All the sections are **compulsory**.*
- *Write down the Serial Number of the question before attempting it and do all questions of a section at one place.*

**Section – A** 3 X 5 = 15 Marks

| No. | Detail of Question | Marks | CO | BL | KL |
|---|---|---|---|---|---|
| 1 | What is regression? Give examples of practical problems solved using regression. | 3 | 1 | U | C |
| 2 | Explain the different strategies of addressing missing data values. | 3 | 2 | U | F |
| 3 | Let's assume the confusion matrix of win/loss prediction of cricket match problem to be as below:<br>**Actual Win** / **Actual Loss**<br>**Predicted Win**: 85 / 4<br>**Predicted Loss**: 2 / 9<br>Calculate the accuracy, precision, recall, and F1-score. | 3 | 2 | A | P |

| | | | | | |
|---|---|---|---|---|---|
| 4 | Covid-19 tests are common nowadays, but some results of tests are not true. Let's assume; a diagnostic test has 99% accuracy and 60% of all people have Covid-19. If a patient tests positive, what is the probability that they actually have the disease? | 3 | 3 | A | P |
| 5 | Differentiate between feature selection and feature extraction. Explain the need for the PCA. | 3 | 5 | U | C |

**Section – B** 5 X 3 = 15 Marks

| No. | Detail of Question | Marks | CO | BL | KL |
|---|---|---|---|---|---|
| 6 | Consider the following results obtained on correlation of number of hours spent in driving (X) with the risk of developing acute backache (Y). Compute parameters of a linear regression model.<br><br>**Number of hours (X)**: 10, 9, 2, 15, 10, 16, 11, 16<br>**Risk Score on a scale of 0-100 (Y)**: 95, 80, 10, 50, 45, 98, 38, 93<br><br>a)Find the regression line Y = A.X + B.<br>b)Use the regression line as a model to estimate the Risk Score on **12** hours of driving. | 5 | 2 | A | P |
| 7 | What is the difference between simple linear regression, multi-linear regression, and polynomial regression? Write down the hypothesis and cost function of Logistic Regression. | 5 | 1 | U | C |

Course Name: .NET FRAMEWORK by using C#

Course Outcome

CO1- Understanding architecture of visual studio.net.
CO2- Understand object oriented concept with exception handling using c# language.
CO3- Understand multithreading, file handling and concept generic classes.
CO4- Understand structure of assembly with built in attributes
CO5- Develop window services and web service as advance concept
CO6 -Understand graphics based programming and image processing.

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**Mid Term Examination, Odd Semester 2022-23**
**MCA, 2nd Yr, III Sem**
**MCAE0402:.NET FRAMEWORK by using C#**

**Time: 2 Hours** **Maximum Marks: 30**

**Section – A**

*Attempt All Questions* 3 X 5 = 15 Marks

| No. | Detail of Question | Marks | CO | BL | KL |
|---|---|---|---|---|---|
| 1 | Differentiate Managed code and Unmanaged code with example and define the role of garbage collection in C#. | 3 | CO1 | U | C |
| 2 | What is variable in C#? Write the difference between read only and constant variable with example. | 3 | CO2 | R | F |
| 3 | Write down the difference between identifiers and keyword. Explain static variable in C# with the help of example. Enlist the identifiers and keyword in following program:<br>using System;<br>namespace HelloWorld<br>{<br>class Hello<br>{<br>static void Main(string[] args)<br>{<br>Console.WriteLine("Hello World!");<br>}<br>}<br>} | 3 | CO4 | A | P |
| 4 | Explain jagged Array in C#. Write the syntax of jagged Array and WAP to illustrate the use of jagged array . | 3 | CO3 | A | C |

| | | | | | |
|---|---|---|---|---|---|
| 5 | Explain delegate in C# and write the syntax for declaration of delegate. WAP to illustrate the use of Delegates. | 3 | CO4 | A | P |

**Section – B**

*Attempt All Questions* 5 X 3 = 15 Marks

| No. | Detail of Question | Marks | CO | BL | KL |
|---|---|---|---|---|---|
| 6 | Define the Layered Architecture of .net framework in detail. | 5 | CO1 | U | C |
| 7 | Enlist all concept of Object Oriented programming language with example. | 5 | CO2 | U | F |
| 8 | Define polymorphism. Write the difference between Runtime Polymorphism and Compile time polymorphism with example and How we can achieve runtime polymorphism? | 5 | CO2 | A | P |

Course Name: Internet of Things

Course Outcome

CO1: Explain the principles of operation of the main types of sensors.
CO2: Understand the main characteristics of sensors.
CO3: Select appropriate sensors for a given application and design simple electronic sensor interface systems.
CO4: Utilize the merits of various types of sensors for a wide range of applications

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# Mid Term Examination, Odd Semester 2022-23
## MCA, II Year, III Semester
## MCAE 0305 Internet of Things

**Time: 2 Hours** **Maximum Marks: 30**

### Section – A

*Attempt All Questions* 3 X 5 = 15 Marks

| No. | Detail of Question | Marks | CO | BL | KL |
|---|---|---|---|---|---|
| 1 | How can you best define the word "Internet of Things"? Explain the role of "Things" in IoT along with its main components. | 3 | 1 | R | D |
| 2 | Why "Sensors" are considered as the main prominent component of IoT. Justify the importance of Sensors in the field of IoT. | 3 | 2 | U | F |
| 3 | What are "microcontrollers". Compare Arduino UNO with NodeMcu in respect with their main feature and drawbacks. | 3 | 1 | E | C |
| 4 | Write in brief about 5 different sensor with respect to their working and functionality. | 3 | 2 | U | C |
| 5 | Write about actuators and transducers. How it is related with sensor? Justify with the example. | 3 | 1 | R | P |

### Section – B

*Attempt All Questions* 5 X 3 = 15 Marks

| No. | Detail of Question | Marks | CO | BL | KL |
|---|---|---|---|---|---|
| 6 | What is Machine to Machine architecture (M2M). How it is different from IoT? | 5 | 2 | R | C |
| 7 | Write a sketch in Arduino UNO and 3 LED's RED, GREEN and BLUE. Blink RED LED after every 2 seconds, Blink GREEN LED after every 1 second and Blink BLUE LED after every 1/2 second. | 5 | 3 | U | F |

| | | | | | |
|---|---|---|---|---|---|
| 8 | Insects and pests are a major cause of concern for the agriculture industry. They affect the agricultural produce at various stages in farming like pre-harvest, harvest, and post-harvest. In order to increase the agricultural productivity, crops and produce needs to be protected from these rodents and pests.<br>**Propose an IoT-based solution to make the process of pest and insect control and management accurate, timely, and efficient. Think and Discuss the type of sensors that can be used. Mention how your proposed solution addresses all the mentioned requirements.** | 5 | 2 | R | C |

Course Name: **CRYPTOGRAPHY & NETWORK SECURITY**

Course Outcome

CO1- Understands the basic concepts of cryptography.
CO2: Apply the symmetric key concepts of DES and AES for securing data.
CO3: Apply the concepts of number theory of Asymmetric key cryptosystem.
CO4: Understand the concepts of hash function, MAC and digital signature for data integrity.
CO5: Explain the symmetric and asymmetric key distribution techniques.
CO6: Understand the concepts of security mechanism at TCP/IP layer.

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# Mid Term Examination, Odd Semester 2022-23
## MCA YEAR:II . Semester- III
## CRYPTOGRAPHY & NETWORK SECURITY (MCAE0003)

**Time: 2 Hours** **Maximum Marks: 30**

**Section – A**

*Attempt All Questions* 3 X 5 = 15 Marks

| No. | Detail of Question | Marks | CO | BL | KL |
|---|---|---|---|---|---|
| 1 | Which security mechanism(s) are provided in each of the following cases?<br>I: A school demands student identification and a password to let students log into the school server.<br>II. A school server disconnects a student if she is logged into the system for more than two hours.<br>III. A professor refuses to send students their grades by e-mail unless they provide student identification they were pre assigned by the professor.<br>IV. A bank requires the customer's signature for a withdrawal. | 3 | 1 | U | P |
| 2 | State Chinese Remainder theorem and Use CRT to solve the simultaneous congruences $X \equiv 2 \bmod 3$, $X \equiv 3 \bmod 5$, $X \equiv 2 \bmod 7$ | 3 | 3 | A | C |
| 3 | State Extended Euclidean algorithms. Use an affine cipher to encrypt the message "life is full of surprises" with the key pair (11, 2) in modulus 26. Use encoding of 00 to 25 for letters A to Z respectively. | 3 | 3 | A | F |
| 4 | What do you understand by Euler's phi Function? Enlist various properties of Euler's phi Function.<br>Find the result of $3^{100000} \bmod 53$ using fermat's theorem. | 3 | 3 | U | F |
| 5 | Given e=7 and n=527; encrypt and decrypt the message "GOD" by using the RSA algorithm. Use encoding of 00 to 25 for letters A to Z respectively. | 3 | 3 | E | P |

## Section – B

*Attempt **All** Questions* 5 X 3 = 15 Marks

| No. | Detail of Question | Marks | CO | BL | KL |
|---|---|---|---|---|---|
| 6 | **a.** Explain the round structure of DES in detail by giving the appropriate figure. In DES algorithm, if we generate 8 subkeys instead of 16 and will use those 8 subkeys in the 16 rounds of the DES i.e. one subkey will be used in two rounds. What be effect of that change in the DES algorithm?<br>**b.** Discuss the block of cipher mode of operation which can address the limitation of electronic codebook mode. | 5 | 2 | U | F |
| 7 | Define primitive root. For the group $G=< Z_{13}^*, X >$. Find the order of the group, order of each element of the group, number of primitive roots and all the primitive roots of the group. | 5 | 3 | A | C |
| 8 | **a.** What do you mean by GF(p). Show that GF(7) is a field.<br>**b.** Use the playfair cipher to encipher the message "must see you over cadogan west". The secret key can be made by filling the first and part of the second row with the word "occurrence" and filling the rest of the matrix with the rest of the alphabet. | 5 | 1 | An | P |

Course Name: Environmental Studies

Course Outcome

CO1- To recognize the environmental issues pertaining to daily life, gain awareness for the need of environmental education for sustainable development.

CO2- To acquire knowledge in ecological perspective and value of environment, biotic components, ecosystem process: energy, food chain, water cycle etc

CO3- To interpret water quality standards and parameters, assessment of water quality, air pollution, pollutants, acid rain, global climate change and greenhouse gases.

CO4- To appreciate the concept of green energy and alternate energy resource for future energy demand.

CO5- To classify the variety of social issues associated with environmental deterioration involving human component including legislative tool such as population, ethics and urban settlements.

CO6- To contribute to create awareness among generation to come and society at large.

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## Mid Term Examination, Odd Semester 2022-23
## BSc. (Phy), II Year, III Semester
## B.Tech. (Civil), III Year, V Semester
## BCHS 0201 Environmental Studies

**Time: 2 Hours** **Maximum Marks: 30**

### Section – A

*Attempt **All** Questions* 3 X 5 = 15 Marks

| No. | Detail of Question | Marks | CO | BL | KL |
|---|---|---|---|---|---|
| 1 | Write the scope and importance of environment. | 3 | 1 | R | F |
| 2 | Write the various classification of ecosystem in briefly. | 3 | 2 | A | C |
| 3 | Define Ecosystem? Discuss briefly balanced ecosystem. | 3 | 2 | U | P |
| 4 | Define Bio-magnification and Eutrophication. | 3 | 2 | R | F |
| 5 | Write an explanatory note on water crises in India. | 3 | 3 | U | P |

### Section – B

*Attempt **All** Questions* 5 X 3 = 15 Marks

| No. | Detail of Question | Marks | CO | BL | KL |
|---|---|---|---|---|---|
| 6 | Explain briefly the structure of atmosphere with the help of a labelled diagram, stating all important activities taking place in different temperature zone regions. | 5 | 2 | A | P |
| 7 | Enumerate Natural Resources? Discuss the various causes and effects of deforestation on Environment. | 5 | 2 | R | C |
| 8 | Enumerate environmental consequences of Mining and industries. | 5 | 3 | A | P |