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Mid-Term Examination, Odd Semester 2021-22  
Programme: MCA Year: II/ III  
Cloud Computing, MCAE 0306 Maximum Marks: 30  
Time: 2 Hours

### Section- A

Note: Attempt All Three Questions.  $3 \times 2 = 6$  Marks

- I. Explain various challenges in cloud computing environment.
- II. Compare desktop virtualization with the application virtualization.
- III. Explain different types of Cloud delivery models with the help of examples.

### Section- B

Note: Attempt All Three Questions.  $3 \times 3 = 9$  Marks

- I. What are the shortcomings of physical infrastructure? Also, compare the traditional IT infrastructure with the virtualized infrastructure.
- II. Explain different types of hypervisor with the help of examples.
- III. Define Cloud Bursting? Also, give the differences between hybrid and community cloud.

### Section - C

Note: Attempt Any Three Questions.  $3 \times 5 = 15$  Marks

- I. Explain Operating system level virtualization. Also, compare virtualization with containerization.
- II. Compare full virtualization with para virtualization? Also, compare hardware assisted virtualization with software assisted virtualization.

- III.** Explain at least five different types of services that fall in the category of XaaS?
- IV.** How cloud computing is related to client server model, cluster computing, grid computing and utility computing?

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Mid-Term Examination, Odd Semester 2021-22

MCA, II Year, III Semester

Subject Code: MCAE0202 Machine Learning

Time : 2 Hours

Maximum Marks: 30

### Section- A

*Note: Attempt All Three Questions.*

$3 \times 2 = 6$  Marks

1. In a linear regression model for a particular data set, you observe the coefficient of one of the features having a relatively high negative value, what you can say about whether this feature has a strong effect on the model or not. Justify.
2. A binary model makes predictions and predicts 160 samples as belonging to the section A, 105 of which are correct, and 55 of which are incorrect. Calculate the precision value for this model.
3. What is the drawback associated with squared error loss while evaluating the Logistics Regression Model.

### Section- B

*Note: Attempt All Three Questions.*

$3 \times 3 = 9$  Marks

1. What are the different performance measures while evaluating the performance of a learning system? Explain.
2. While designing a learning system what are the issues which needs to be dealt with. Explain.
3. Illustrate the difference between supervised learning system and reinforcement-based learning system.

### Section - C

Note: Attempt Any Three Questions.

3 x 5 = 15 Marks

1. Let us say that we are fitting one-parameter model to the data, i.e.  $y_n \approx \beta_0$ . The average of  $y_1, y_2, \dots, y_N$  is 1. We start gradient descent at  $\beta_0^{(0)} = 0$  and set the step-size to 0.5. What is the value of  $\beta_0$  after 3 iterations, i.e., the value of  $\beta_0^{(3)}$ .

2. The sales of a company (in million dollars) for each year are shown in the table below.

|           |      |      |      |      |      |
|-----------|------|------|------|------|------|
| x (year)  | 2005 | 2006 | 2007 | 2008 | 2009 |
| y (sales) | 12   | 19   | 29   | 37   | 45   |

- a) Find the least square regression line  $y = a x + b$ .
- b) Use the least squares regression line as a model to estimate the sales of the company in 2012.
3. Explain Bias variance Trade off also elaborate how overfitting can be removed with one strategy.
4. How the parameters are updated in regression Model. How the learning rate changes the convergence criteria of an objective function. Explain.

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**University Roll No.....**

**Mid-Term Examination, Odd Semester 2021-22**

**MCA, II & III Year, III & V Sem.**

**MCAE0402: .NET Framework by using C#**

**Time :2 Hours**

**Maximum Marks: 30**

**Section- A**

**Note: Attempt All Three Questions.**

**$3 \times 2 = 6$  Marks**

Q1. Enlist all concepts of Object oriented programming language?

Q2. How we can declare constant in C#?

Q3. Write properties of a constructor in C#?

**Section- B**

**Note: Attempt All Three Questions.**  $3 \times 3 = 9$  Marks

Q1. Differentiate between value types and reference types?

Q2. Which utility is useful to convert MSIL Code to Native Code? What is the importance of MSIL Code in .Net Framework and how it is differ from Native Code?

Q3. Why we use smart array in C#? Write syntax of smart array and explain default parameter in it?

**Section – C**

**Note: Attempt Any Three Questions.**

**$3 \times 5 = 15$  Marks**

Q1. Define the Layered Architecture of .Net Framework in detail?

Q2. Why we use Delegate in C#? Discuss its life cycle with example?

Q3. Discuss smart field with example?

Q4. WAP in C# to design a class name is “student” with parametrized constructor to initialize name and rollno of student. And design smart field “NAME” to access name of student object. Write method to display of student. Call all in main method and write output for the same.

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University Roll No.....

Mid-Term Examination, Odd Semester 2021-22

B.Tech (MCA), II & III Year, III & V Semester

**MCAE 0305: INTERNET OF THINGS**

Time: 2 Hours

Maximum Marks: 30

**Section- A**

Note: Attempt All Three Questions.

$3 \times 2 = 6$  Marks

**Q1.** What are the main components of IoT system?

**Q2.** What is sensor, explain their type with example?

**Q3.** How Arduino Uno supportive to start learn IoT and explain their main feature and drawback?

**Section- B**

Note: Attempt All Three Questions.

$3 \times 3 = 9$  Marks

**Q1.** Explain the various emerging IoT applications.

**Q2.** Differentiate between Sensor, transducer and Actuators with example.

**Q3.** Explain the scope of IoT and also explain the current status and future aspect of IoT.

**Section – C**

Note: Attempt Any Three Questions.

$3 \times 5 = 15$  Marks

**Q1.** Explain the PIN diagram of Smoke/Alcohol sensor and also gives the details where we can use the MQ2, MQ3, MQ4 and MQ135.

**Q2.** Write a program and steps to interface temperature sensor LM35 and Ultrasonic sensor to Arduino Uno. Turn on the LED if temperature value (For LM35) and distance (for Ultrasonic) met threshold value (Assume).

**Q3.** Internet of Things (IoT) allows us to implement home automation system that can be controlled remotely through internet. The proposed system can monitor different parameters like gas, light, motion detection, temperature, etc. using the sensor data and also trigger a process according to the requirement. The data from the sensors are uploaded to a cloud server and this data can be used to analyze the parameters.

Draw a layout for above proposed system, also mentioning the name of devices, sensors and cloud server.

**Q4.** Write a code in embedded C/ Python using MQ3 sensor and buzzer to measure the intensity of alcohol. If its value crosses 1. 2 mg/L, generate a buzzer alarm for 2 seconds. Send the MQ3 values to the serial monitor also.

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University Roll No.....

Mid-Term Examination, Odd Semester 2021-22

Program: MCA, Year-II/III, Semester III/V

MCAE0003: Cryptography & Network Security

Time :2 Hours

Maximum Marks: 30

Section- A

Note: Attempt All Three Questions.

3 x 2 = 6 Marks

- I. What do you understand by network security attack? Describe Active and Passive attacks with suitable example and diagram.
- II. What is Shannon's theory of confusion and diffusion? A small private club has only 100 members. How many secret keys are needed if all members of the club need to send secret messages to each other?
- III. What do you mean by authentication and message integrity in cryptography? List all the multiplicative inverse pairs in modulus 20.

Section- B

Note: Attempt All Three Questions.

3 x 3=9 Marks

- I. Use the playfair cipher to encipher the message "the key is hidden under the door pad". The secret key can be made by filling the first and part of the second row with the word "GUIDANCE" and filling the rest of the matrix with the rest of the alphabet.
- II. State Extended Euclidean algorithms. Using the Euclidean algorithm find the multiplicative inverse of 132 in Z180.
- III. Find the adjoint of the matrix K, if  $K = \begin{pmatrix} 13 & 4 \\ 14 & 17 \end{pmatrix}$  and then  $K^{-1}$  under modulo 26.

### Section - C

Note: Attempt Any Three Questions.

3 x 5 = 15 Marks

- I. State Chinese Remainder theorem and Use CRT to solve the simultaneous congruences  $X \equiv 1 \pmod{P}$  for all  $P \in \{2,3,5,7\}$ .
- II. Define primitive roots and find the primitive roots of the group  $G = (Z_{11}^*, \cdot)$ .
- III. Explain round structure of Data Encryption Standard (DES) structure in detail by giving the appropriate figure. Also discuss strength and limitations.
- IV. Differentiate between:
  - a. Cryptography and Steganography
  - b. Cryptanalysis attack and Brute Force attack

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Mid-Term Examination, Odd Semester 2021-22

Program: -B.Sc. (Phy), M.Sc. (Maths) & MCA II Year, III Semester  
Subject Code: Environmental Studies (BCHS-0201)

Time: 2 Hours

Maximum Marks: 30

Section- A

Note: Attempt All Three Questions.

$3 \times 2 = 6$  Marks

- I. Define eutrophication and Bio-magnification.
- II. What are herbivores and carnivores?
- III. "Environmental Science is multidisciplinary in nature" Explain.

Section- B

Note: Attempt All Three Questions.

$3 \times 3 = 9$  Marks

- I. Hydrogen energy can be considered as an alternate source of Energy' Justify.
- II. What is an Ecosystem? How an ecosystem can be classified? Explain with examples.
- III. Write an explanatory note on mineral resources of India.

Section – C

Note: Attempt Any Three Questions.

$3 \times 5 = 15$  Marks

- I. Enumerate environmental consequences of transportation and Agriculture.
- II. What is deforestation? Enumerate and discuss the various its causes and effects.
- III. Discuss the vertical structure of atmosphere with the help of a labelled diagram, stating all important activities taking place in different temperature zone regions.
- IV. (a) Fresh water is the biggest crisis facing the world today. Discuss the reasons and remedial measures for fresh water crisis. [3]  
(b) Explain Food Chain & its significance. [2]