

Printed Pages:02 University Roll No:,
End Term Examination, Odd Semester 2021-22
Program: MCA Year: II/III Semester: III/V
Subject Code: MCAE0306 Subject: Cloud Computing
Time: 3 Hours Maximum Marks: 50

Section- A

Note: Attempt ANY FIVE Questions. 5 x 4 = 20 marks

- (I) Explain different models for deployment in cloud computing with the help of examples.
- (II) What are the advantages and disadvantages of using cloud computing? What is cloud-enabling technologies?
- (III) Is virtualization necessary for cloud computing? Discuss types of virtualization with the help of diagrammatic presentation.
- (IV) What is web 2.0? Also discuss the difference between 1.0 and 2.0?
- (V) What do you mean by Multi-cloud? Write main features of multi-cloud environment.
- (VI) Discuss various cloud security threats in detail.

Section- B

Note: Attempt ALL Questions. 5 x 3 = 15 marks

- (I) How do you ensure security in cloud computing? Explain in detail.
- (II) What software can help with automation for a multi cloud environment? Why use a multi cloud strategy?

- (III) What do you understand by Abuse and Nefarious of Cloud Computing? How as a user you can protect yourself from this?
- (IV) What security aspects do you receive along with the cloud? Explain the host-hopping attack.
- (V) What is VPN? Name the security services VPN provides. Explain with the help of example.

Section- C

Note: Attempt ANY THREE Questions. $3 \times 5 = 15$ marks

- (I) What are the security challenges in cloud computing? Suggest appropriate approaches to overcome these challenges.
- (II) Discuss the role of cloud computing in SCM and CRM. Explain with the help of example
- (III) During pandemic how the industries such as education and social networking used cloud computing for their business?
- (IV) Why should you use cloud computing? Discuss Cloud delivery models with the help of a diagrammatic presentation and examples.

Printed Pages:04 **University Roll No:**
End Term Examination, Odd Semester 2021-22
Program : MCA, Year: II / III, Semester: III / V

Subject Code: MCAE 0202, Subject: Introduction to Machine Learning

Time: 3 Hour

Maximum Marks: 50

Section-A

Note: Attempt ANY FIVE Questions 5*4=20 marks

- I. Differentiate between linear and Logistic Regression with the help of suitable examples.
- II. What is the difference between over-fitting and under-fitting? Explain in brief with the help of suitable examples. Why there is requirement of low bias and low variance for a good machine learning model.
- III. Determine the general principle of an ensemble method. Discuss the bagging and boosting in detail with their key differences.
- IV. Cluster the following eight points (with (x, y) representing locations) into three clusters:
A1(2, 10), A2(2, 5), A3(8, 4), A4(5, 8), A5(7, 5), A6(6, 4), A7(1, 2),
A8(4, 9)
Initial cluster centers are: A1(2, 10), A4(5, 8) and A7(1, 2).
The distance function between two points a = (x₁, y₁) and b = (x₂, y₂) is defined as- P(a, b) = |x₂ - x₁| + |y₂ - y₁|
Use K-Means Algorithm to find the three cluster centers after the first iteration.
- V. What is the curse of dimensionality? Discuss the steps of PCA algorithm with an example.

- VI. What do you mean by a hard margin in SVM? The minimum time complexity for training an SVM is $O(n^2)$. According to this fact, what sizes of datasets are not best suited for SVM's? Suppose you are using RBF kernel in SVM with high Gamma value. What does this signify?

Section-B

Note: Attempt ALL Questions

5*3=15 marks

- I. How does Naïve Bayes classifier work? An art competition has entries from three painters: Vipin, Rohit and Ajay.
 - Vipin put in 15 paintings, 4% of his works have won First Prize.
 - Rohit put in 5 paintings, 6% of his works have won First Prize.
 - Ajay put in 10 paintings, 3% of his works have won First Prize.What is the chance that Vipin will win First Prize?
- II. Describe Bias and Variance Tradeoff and why we do the regularization. Three different people weigh a standard mass of 2.00 g on the same balance. Each person obtains a reading of exactly 7.32 g for the mass of the standard. What does this results imply?
- III. Enlist steps of K-means clustering methods. Explain the reason behind the convergence of the K-means method.
- IV. Consider an Object recognition system to classify objects in an image as cats or dogs.

The system takes an image with 8 dogs and 2 cats as input, and predicted 9 dog and 1 cat.

 - a. Judge the precision of the system?
 - b. Compute the recall of the system?
- V. Estimate the accuracy of the system? Write ID3 algorithm for building decision trees. What are the limitation of ID3 algorithm?

Section-C

Note: Attempt ANY THREE Questions

3*5=15 marks

- I. Explain the Naïve Bayesian Classifier algorithm. Consider the following training record.

Tid	Refund	Marital Status	Taxable Income	Evade
1	Yes	Single	125K	No
2	No	Married	100K	No
3	No	Single	70K	No
4	Yes	Married	120K	No
5	No	Divorced	95K	Yes
6	No	Married	60K	No
7	Yes	Divorced	220K	No
8	No	Single	85K	Yes
9	No	Married	75K	No
10	No	Single	90K	Yes

Given a new instance X=(Refund=No, Married, Income=120K), Predict whether the Evade is Yes or No.

- II. Consider the dataset (D) as given below. The attribute elevation, road type, and speed limit are features. However, Speed is the target variable.

Elevation	Road Type	Speed-Limit	Speed
Steep	Uneven	Yes	Slow
Steep	Smooth	Yes	Slow
Flat	Uneven	No	Fast
Steep	Smooth	No	Fast

- a. Find the entropy of the target variable.
- b. Find Information gain of the target variable with respect to Elevation.
- c. Find the root node of the decision-tree.

III. Explain the Adaboost algorithm with an example. How it is different from random Forest?

IV. Explain SVM classifier. What are the support vectors, hyper plane and kernel in SVM? Discuss the mathematical modeling of support vector machine (SVM).

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University Roll No:

End Term Examination, Odd Semester 2021-22

MCA, II/ III Year, III/ V Sem

MCAE0402: .Net Framework using C#

Time: 3 Hour

Maximum Marks: 50

Section- A

Note: Attempt ANY FIVE Questions.

5 x 4 = 20 marks

- (I) Explain the various *task performed by CLR*?
- (II) What is Object-Oriented Programming (OOP)? Describe various features of OOPs.
- (III) Define jagged Array with Example?
- (IV) Define Unsafe block? Explain `int *ptr, i;` statement in C#?
- (V) What is Thread? Draw the life cycle of Thread with associated methods?
- (VI) What is Exceptions? Illustrate how we use multiple catch with single try block with the help of an example?

Section- B

Note: Attempt ALL Questions.

5 x 3 = 15 marks

- (I) What do you mean by stream? Enlist various methods used in File Stream class with their usage?
- (II) Write three major difference between GDI and GDI+?
- (III) Explain advantages of disconnected mode as compare to connected mode in ADO. NET?
- (IV) What is assembly? Discuss various component and types of assembly?
- (V) Define Window service with example?

Section- C

Note: Attempt ANY THREE Questions.

$3 \times 5 = 15$ marks

- (I) If there is a method which already exist at any server in all over the world, then how can you call such method? Define concept with required components with example?
- (II) Write C# program to write (A-Z) in “abc.txt” file by using character stream.
- (III) Write C# program to display student details from student table by using connected mode in ADO.NET.
- (IV) Write short note on: Background and Foreground thread, Byte and character stream, and System. Drawing Namespace

Printed Pages: University Roll No:

End Term Examination, Odd Semester 2021-22

MCA, II & III Year, III & V Semester

MCAE0305: Internet of Things

Time: 3 Hour

Maximum Marks: 50

Section- A

Note: Attempt ANY FIVE Questions. 5 x 4 = 20 marks

- (I) Define Actuators with examples?
- (II) Draw and describe the PIN diagram of Smoke/Alcohol sensor? Write use of MQ2 protocol?
- (III) Differentiate between passive infrared sensor with Ultrasonic sensor with their application.
- (IV) Explain MQTT and MQTTS protocol in details.
- (V) Why scheduling is important in IoT application?
- (VI) Why RPi is better than Node MCU?

Section- B

Note: Attempt ALL Questions. 5 x 3 = 15 marks

- (I) Explain the potential and benefits of an IoT oriented approach over M2M by considering a Health band as the real world use case example. Compare the Main characteristics of M2M and IoT.
- (II) How does the Internet of Things (IoT) affect our everyday lives? Draw a block diagram of rain sensor.
- (III) Write the steps to connect with Node MCU and Blink App. Explain PIR sensor with block diagram.

- (IV) How to configure Arduino board with wi-fi and Ethernet module? Also show connectivity with normal sensor.
(V) Which one is better Node MCU or Arduino board? How to make battery in deep sleep mode and awake it?

Section- C

Note: Attempt ANY THREE Questions.

$3 \times 5 = 15$ marks

- (I) How does IoT influence the development of smart cities?
Write the name of essential sensor, needs in smart city project.
(II) What are the major impacts of IoT in the Healthcare Industry? What are the sensors needs in smart home?
(III) Explain Rate Monotonic Algorithm with suitable example.
(IV) Explain Deadline First Algorithm with suitable example.

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End Term Examination, Odd Semester 2021-22

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

MCAE0003 Cryptography & Network Security

Time: 3 Hour

Maximum Marks: 50

Section- A

Note: Attempt ANY FIVE Questions.

$5 \times 4 = 20$ marks

- I. Discuss the block cipher mode which can address the limitation of electronic codebook mode. Using Fermat's theorem, find $3^{201} \bmod 11$.
- II. Taking reference from OSI security architecture draw a matrix that shows the relationship between security services and security mechanisms.
- III. For the group $G = \langle Z_7^*, \times \rangle$, 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.
- IV. Explain pretty good privacy (PGP) algorithm, list various services supported by PGP.
- V. Give the format of X.509 certificate showing the important elements of the certificate. Explain the format.
- VI. What is firewall? Discuss its different types and possible configurations with suitable diagrams.

Section- B

Note: Attempt ALL Questions.

$5 \times 3 = 15$ marks

- I. Explain RSA Algorithm with computation for public key cryptography. Also Perform encryption and decryption using RSA algorithm for $p=17$, $q=11$, $e=7$, $M=88$.
- II. What is digital signature standard (DSS).Write the DSS scheme of digital signature generation and verification?
- III. Use and briefly define the principal categories of secure electronic transaction (SET).further briefly define the sequence of events that are required for a transaction in SET environment. Explain the concept of dual signature.
- IV. Briefly explain Diffie-Hellman key exchange algorithm. Consider a Diffie-Hellman scheme with a common prime $q=13$, and a primitive root $\alpha=7$.
 - a. If Alice has a private key $X_A=97$, what is Alice's public key Y_A ?
 - b. If Bob has a private key $X_B=233$, what is Bob's public key Y_B ?
 - c. What is the shared secret key?
- V. Discuss and explain the basic building blocks of SHA-512 algorithm. If the size of the input plaintext is 5044 bits, then how many bits of padding is required in SHA-1 algorithm.

Section- C

Note: Attempt ANY THREE Questions.

3 x 5 = 15 marks

- I. What do we need Kerberos authentication protocol? Discuss the role of authentication server, ticket granting server and real server. State the interaction of client with different servers to get the services of real server.
- II. Explain SSL (secure socket layer protocol). Explain SSL protocol stack in detail. Discuss the following sub-protocol of SSL.
 - a).Handshake protocol
 - b).Record protocol
 - c).Alert protocol.
- III. What do you understand by IP security? Explain IP security architecture. Define the following term in context of IP security and explain their purpose.
 - a).Security association (SA).
 - b).Security association database (SAD).
 - c).Security policy database (SPD).
- IV. Give the basic steps of Elgamal Digital Signature Scheme? Perform encryption and decryption using Elgamal scheme for the plaintext 17 by using the group $G = \langle Z_{19}^*, X \rangle$. Give one primitive for the group $G = \langle Z_{19}^*, X \rangle$ is 10 and random integer k is 7. Alice select private key X_A is 5.

Printed Pages:02

University Roll No:

End Term Examination, Odd Semester 2021-22

MCA, M.Sc. (Maths) B.Sc. (Phy.) II Year, IIIrd Semester

BCHS-0201: Environmental Studies

Time: 3 Hour

Maximum Marks: 50

Section- A

Note: Attempt ANY FIVE Questions.

$5 \times 4 = 20$ marks

- (I) Write an explanatory note on forest resources in India.
- (II) Differentiate ecology and environmental science.
- (III) Define Ecosystem. Explain its various components in detail.
- (IV) Write a short note on 'Green House Effect' with special emphasis on causes and effects.
- (V) Discuss 'Acid Rain' with special emphasis on causes and effects.
- (VI) State and discuss the reasons and effects of Urbanization in India

Section- B

Note: Attempt ALL Questions.

$5 \times 3 = 15$ marks

- (I) Explain any one method of disposal of solid waste.
- (II) Enumerate global warming and discuss the various its causes and effects
- (III) Discuss the case study of:
i) Bhopal Gas tragedy ii) London smog
- (IV) Elaborate various types of air pollutants in detail with examples.
- (V) Write a short note on Biodiversity depletion.

Section- C

Note: Attempt ANY THREE Questions.

$3 \times 5 = 15$ marks

- (I) Enumerate NGO. Write the various prominent NGOs in India and Also discuss the work of NGOs in the field of environment.
- (II) What is EIA? Explain various steps involved in EIA process.
- (III) Explain various types, sources and effects of solid waste.
- (IV) Discuss the causes, effects, and preventive measures of Noise pollution.