Total No. of Questions : 12]

SEAT No. :

PD-5237

[Total No. of Pages : 3

[6406]-201

S.Y. M.C.A. (Engineering)

DATA SCIENCE

(2020 Pattern) (Semester - III) (410901)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 , Q.7 or Q.8, Q.9 or Q.10 and Q.11 or Q.12.***
2) ***Neat diagrams must be drawn whenever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Elaborate the use of Data Science with a proper example. **[6]**

b) State the difference between Data Analytics and Data Science. **[6]**

OR

Q2) a) Dcscribc the role of Data Scientist for successful analytic project? **[6]**

b) Differentiate between Quantitative vs. Categorical data and Discrete Data vs. Continuous Data. **[6]**

Q3) a) Paraphrase data warehouse concept. What is the need of a data warehouse? **[6]**

b) Write the importance of data preprocessing in real world scenario? **[6]**

OR

Q4) a) Explain different methods of data Preprocessing. **[6]**

b) With respect to data warehouse explain following terms with suitable example : **[6]**

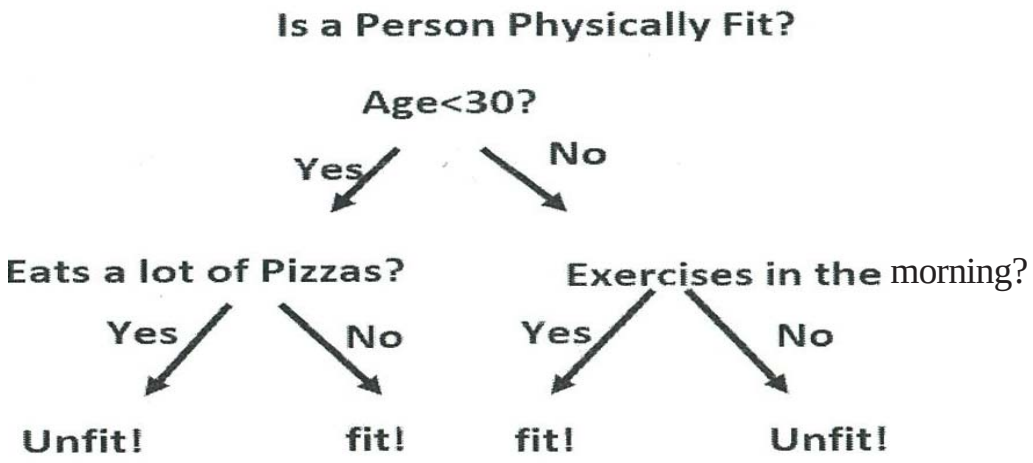
i) Data Lake

ii) Data Mart

iii) Fact table

P.T.O.

Q5) a) Define Decision tree. Find out all possible decisions that can be made by the following decision tree. **[6]**



b) Given a real-world scenario, how would you use the KNN algorithm to solve a practical problem? **[5]**

OR

Q6) a) Distinguish between decision tree and random forest. **[6]**

b) Define classification in Data Science field. Discuss about various types of classification. **[5]**

Q7) a) Construct an FP-Tree for the following data **[6]**

TID	Item
1	A,B,C
2	D,A,C,B
3	C,A,B
4	B,A,D
5	D
6	D,B
7	A,D,B
8	B,C

b) Discuss Support, Confidence, Lift in details. **[6]**

OR

Q8) a) Compare and Contrast FP growth and Apriori algorithm. **[6]**

b) Explain any 6 application of association rule mining. **[6]**

Q9) a) Give a thorough explanation of partitioning clustering. **[6]**

b) State the different types of clustering in details? **[6]**

OR

Q10)a) Illustrate bottom-up and top-down hierarchical clustering approach with an example in detail. **[6]**

b) What is clustering? Clarify the various applications of clustering. **[6]**

Q11)a) Describe Bar Graph, Stacked Bar Chart, Area Chart. **[6]**

b) Analyze the various types of data visualization. **[5]**

OR

Q12)a) Write use and importance of following chart types in data analysis. **[6]**

i) Histogram

ii) Line Chart

iii) Pie Chart

b) Illustrate the data visualization techniques. **[5]**



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SEAT No. :

PD5238

[Total No. of Pages : 2

[6406]-202
S.Y.M.C.A. (Engineering)
WEB TECHNOLOGIES
(2020 Pattern) (Semester - III) (410902)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answers Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) Provide an introduction to Style Sheets (CSS) and explain their significance in web development. **[6]**

b) What is the difference between the Internet and the World Wide Web (WWW)? **[6]**

OR

Q2) a) Discuss the key aspects of website planning and design issues that developers need to consider. **[6]**

b) Discuss the importance of responsive design in modern web development and how CSS facilitates it. **[6]**

Q3) a) Discuss the structure of XML document with suitable example. **[6]**

b) Elaborate different elements and attributes in XML document with example. **[6]**

OR

Q4) a) What are the features of XML? Explain. Also explain its applications. **[6]**

b) Write a code in XML for online book store. **[6]**

Q5) a) Discuss any 6 build in JavaScript objects along with suitable example. **[6]**

b) Explain various ways of accepting the user input via dialog box in JavaScript. **[5]**

OR

P.T.O.

Q6) a) Explain any 5 array properties and methods in JavaScript with suitable example. **[6]**

b) Discuss various control structure in JavaScript. **[5]**

Q7) a) Discuss AngularJS Features in detail. **[6]**

b) Explain any three filters in Angular JS with example. **[6]**

OR

Q8) a) Discuss the way in which the developers used AngularJS to manipulate the table data. **[6]**

b) Describe the process in which external template can be included in AngularJS. **[6]**

Q9) a) What are the different ways of formatting string in PHP. Explain with suitable example. **[6]**

b) Illustrate different types of operators in PHP with example. **[6]**

OR

Q10)a) Discuss the usage of cookies in PHP. How are cookies set, retrieved, and deleted? **[6]**

b) What are associative arrays in PHP? Explain their usage with examples.**[6]**

Q11)a) Explain ActiveX control with reference to ASP.NET. **[6]**

b) What is Managed and Unmanaged code? Explain in detail. **[5]**

OR

Q12)a) What are the different security features available in ASP. Net. **[6]**

b) Discuss the built in features and control for data manipulation in ASP. Net. **[5]**

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Total No. of Questions : 12]

SEAT No. :

PD-5239

[Total No. of Pages : 2

[6406]-203

S.Y. M.C.A. (Engineering)

CLOUD COMPUTING

(410903) (2020 Pattern) (Semester - III)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the rightside indicate full marks.***
3) ***Assume Suitable data if necessary.***

Q1) a) Explain Cloud computing architecture with diagram. **[6]**

b) State the Advantages and Disadvantages of Cloud Computing. **[6]**

OR

Q2) a) Draw and explain Cloud Computing client-server model. **[6]**

b) What is Utility Computing? Explain with example. **[6]**

Q3) a) What is Software as a Service (SaaS) model? Explain features of SaaS and benefits of it? **[6]**

b) Explain Layers in cloud architecture? **[6]**

OR

Q4) a) What is Infrastructure as a Service (Iaa'S) model? Explain features of SaaS and benefits of it? **[6]**

b) Which are different cloud service providers? List features of any 2 cloud providers. **[6]**

Q5) a) What is virtual cluster and resource management? **[6]**

b) Discuss any two Stnadards for Application Developers? **[5]**

OR

Q6) a) Explain Virtualization for Data-Center Automation with example. **[6]**

b) Explain Standards for Security in cloud computing? **[5]**

P.T.O.

Q7) a) What is resource provisioning? Explain various methods of resource provisioning. **[6]**

b) Explain the working of following cloud applications : **[6]**

i) Social Networking

ii) Google Apps

OR

Q8) a) Explain how cloud resources are exchanged globally with a suitable example. **[6]**

b) Write Short notes on:

i) Amazon cloud services ii) Google cloud applications. **[6]**

Q9) a) Explain the following cloud security mechanisms. **[6]**

i) Public key infrastrucutre (PKI),

ii) Identity and Access Management (IAM).

b) Discuss various cloud issues like **[6]**

i) Stability

ii) Regulatory Issues

iii) Service level agreements.

OR

Q10) a) Explain the concept of hashing and digital signature in detail. **[6]**

b) What is single sign on (SSO)? Explain in detail. **[6]**

Q11) a) How cloud can be implemented in futuristic applications like intelligent fabrics and paints? Explain in detail. **[6]**

b) What is mobile cloud and multimedia cloud? Explain in detail. **[5]**

OR

Q12) a) Explain the concept of energy aware cloud computing. **[6]**

b) What is docker? Explain its architecture and workflow? **[5]**



Total No. of Questions : 12]

SEAT No. :

PD5240

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[6406]-204
S.Y. M.C.A. (Engineering)
BIGDATA ANALYTICS
(2020 Pattern) (Semester - III) (410904A) (Elective - II)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume Suitable data if necessary***

Q1) a) What is Big Data? Explain any 5 characteristics of Big data. **[6]**

b) Explain challenges of Big Data. **[6]**

OR

Q2) a) Write short note on - Evolution of Big Data. **[6]**

b) Explain any 3 applications of Big Data. **[6]**

Q3) a) Briefly describe SVM -Support Vector Machine technique. **[6]**

b) Discuss Analysis of Variance (ANOVA) of correlation indicators of linear relationship. **[6]**

OR

Q4) a) List the categories of Clustering methods. **[6]**

b) What is Association rule? **[6]**

Q5) a) Explain Content-based filtering in detail? **[6]**

b) Define Social networks and Social Networking mining. **[5]**

OR

P.T.O.

Q6) a) Explain Collaborative filtering in detail? **[6]**

b) Why is a "Community" in a Social Network Graphs? Explain any one algorithm for finding communities in a Social Graph. **[5]**

Q7) a) What is data modeling and what is the need for it. **[6]**

b) How to deploy a Big Data Model? Mention the key steps involved. **[6]**

OR

Q8) a) What is data visualization? Why is data visualization important? **[6]**

b) What do you mean by "The science of data visualization"? **[6]**

Q9) a) Explain in detail about HIVE. **[6]**

b) Briefly discuss about Map Reduce and YARN? **[6]**

OR

Q10)a) What is Map Reduce Programming Model? How to apply Map Reduce Analysis on social media data like twitter? **[6]**

b) Discuss about How E-Commerce is Using Big Data to Improve Business in detail. **[6]**

Q11)a) Explain the Storage Unit In Hadoop (HDFS)? **[6]**

b) Mention different Features of HDFS? **[5]**

OR

Q12)a) What are the Limitations of Hadoop 1.0? **[6]**

b) What is Hadoop cluster configuration ? How MapReduce works explain with example? **[5]**



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SEAT No. :

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[6406]-205
S.Y. M.C.A. (Engineering)
MACHINE LEARNING
(2020 Pattern) (Semester - III) (410904B) (Elective - II)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data if necessary***

Q1) a) Describe Machine Learning and highlight its key differences from traditional programming methods. **[6]**

b) Explain the main difference between Linear Discriminant Analysis (LDA) and Principal Component Analysis (PCA) in reducing dimensions. **[6]**

OR

Q2) a) What is supervised, unsupervised and semi-supervised learning? **[6]**

b) Explain the main difference between Forward and Backward subset selection methods for dimension reduction. **[6]**

Q3) a) Consider the following three-classes confusion matrix. Consider the following 3- class confusion matrix. Calculate precision and recall per class. Also calculate overall accuracy, precision. **[6]**

	Predicted		
Actual	15	2	3
	7	15	8
	2	3	45

b) Explain construction of multi-class classifiers. **[6]**

i) One Vs. All approach

ii) One Vs. One approach

iii) Error correcting output codes approach.

OR

P.T.O.

Q4) a) Consider the following data to predict the student pass or fail using the K-Nearest Neighbor Algorithm (KNN) for the values physics = 6 marks, Chemistry = 8 marks with number of Neighbors K = 3. **[6]**

Physics (marks)	chemistry (marks)	Results
4	3	Fail
6	7	Pass
7	8	Pass
5	5	Fail
8	8	Pass

b) Explain Kernel methods for non-linearity. **[6]**

Q5) a) Explain with examples: Overfitting and Underfitting. **[6]**

b) Explain ridge regression and lasso regression in detail. **[5]**

OR

Q6) a) Draw and Explain the bias-Variance tradeoff. **[6]**

b) Explain the term "Polynomial regression". **[5]**

Q7) a) Explain the concept of Hierarchical Clustering with example. **[6]**

b) Define and explain the following terms. **[6]**

i) Minority class.

ii) Gini Index.

iii) Entropy.

OR

Q8) a) Explain K-Means clustering algorithm and how the elbow method is used to decide the value of cluster k. **[6]**

b) How empirical probabilities can be used in ranking and probability estimation trees? **[6]**

Q9) a) Write and explain Native Bayes Classification Algorithm. **[6]**

b) Describe Normal Distribution with its features. **[6]**

OR

Q10)a) Write a short note on GMM(Gaussian Mixture Method). **[6]**

b) Explain discriminative learning. **[6]**

Q11)a) Explain bagging and boosting as ensemble methods. **[6]**

b) Write a short note on Feed-forward Neural Network. **[5]**

OR

Q12)a) What is the motivation behind Reinforcement Learning? Explain it with help of diagram stating its important entities **[6]**

b) Write note on Deep Learning and its applications. **[5]**



Total No. of Questions : 12]

SEAT No. :

PD5242

[Total No. of Pages : 2

[6406]-206
S.Y.M.C.A. (Engineering)
OBJECT ORIENTED ANALYSIS AND DESIGN
(2020 Pattern) (Semester - III) (410904C)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) Explain 4+1 architecture view. **[6]**

b) Draw Use case diagram for online shopping system. **[6]**

OR

Q2) a) Explain unified process in detail. **[6]**

b) Draw Use case diagram for admission process. **[6]**

Q3) a) Differentiate between Aggregation and Composition. **[6]**

b) Draw Class diagram for library management system. **[6]**

OR

Q4) a) What is association? Explain different types of association. **[6]**

b) Draw class diagram for online bus reservation system. **[6]**

Q5) a) Explain Component diagram with example. **[6]**

b) Write note on package diagram. **[5]**

OR

Q6) a) Explain deployment diagram with example. **[6]**

b) Write note on Applications of UML. **[5]**

P.T.O.

Q7) a) Draw Activity diagram for opening e-mail account. **[6]**

b) Draw sequence diagram for online registration for medical test. **[6]**

OR

Q8) a) Draw the state transition diagram for Online Auction Process. **[6]**

b) Draw activity diagram for online test for candidate for placement. Make suitable assumptions. **[6]**

Q9) a) Write a note on Object oriented software architecture. **[6]**

b) What are 5 principles of architecture? **[6]**

OR

Q10)a) Write a note on client server architecture. **[6]**

b) Explain component diagram with suitable example. **[6]**

Q11)a) Write a note on adaptor design pattern. **[6]**

b) What is meant by Iterator design pattern? **[5]**

OR

Q12)a) Write a note on observer design pattern. **[6]**

b) Describe architectural design patterns in brief. **[5]**

* * *

Total No. of Questions : 12]

SEAT No. :

PD-5243

[Total No. of Pages : 2

[6406]-207
S.Y. M.C.A. Engineering
INTERNET OF THINGS
(2020 Pattern) (Semester - III) (410904 D) (Elective - II)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidate:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6,Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data if necessary.***

Q1) a) What are the main functional blocks of an IoT system? **[6]**

b) What are the key characteristics of embedded systems? **[6]**

OR

Q2) a) Write a short note on common hardware components used in IoT devices? **[6]**

b) Describe how IoT devices typically communicate with each other? **[6]**

Q3) a) Write in brief about " Without Machine can IoT Technology Survive". **[6]**

b) Explain the Capabilities of IoT. **[6]**

OR

Q4) a) Explain the Design Principle of IoT. **[6]**

b) Define M2M and Explain M2M Value Chain. **[6]**

Q5) a) Explain the Architecture of IoT. **[6]**

b) Define An IoT Architecture as a State of the Art. **[5]**

OR

P.T.O.

Q6) a) Explain the Architectural View of IoT. **[6]**

b) Describe the Functional View of IoT. **[5]**

Q7) a) Describe KNX Protocol in IoT. **[6]**

b) Explain Network Layer and APS Layer. **[6]**

OR

Q8) a) Explain The Protocol Standardization of IoT? **[6]**

b) Describe the WSN Protocol. **[6]**

Q9) a) Explain the Privacy and Security Issues? **[6]**

b) Explain the IoT Security. **[6]**

OR

Q10) a) Describe “The Smart city concept through IoT”. **[6]**

b) Explain the Privacy In IoT Data Platforms. **[6]**

Q11) a) Write the case study on IoT technology utilized in Aadhar Card systems **[6]**

b) Explain how do IoT-enabled Smart Parking Systems improve urban mobility? **[5]**

OR

Q12) a) Explain Future Factory Concepts and how do they leverage IoT? **[6]**

b) Discuss the role of voice assistants in home automation systems? **[5]**

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SEAT No. : ____

PD-5244

[Total No. of Pages : 2

[6406]-209
S.Y. M.C.A. (Engg.)
SOFTWARE TESTING & QUALITY ASSURANCE
(2020 Pattern) (Semester - III) (410905)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume Suitable data if necessary.***

Q1) a) What is Software Quality Assurance? Explain various activities of SQA. **[6]**

b) Write a note on Software Quality Assurance Trends. **[6]**

OR

Q2) a) List out the tabular difference between Quality Control and Quality Assurance. **[6]**

b) Describe the Software System Security concept in details. **[6]**

Q3) a) What are the basic principles of testing used in software testing? **[6]**

b) List out the components of Test Plan as per IEEE 829 standards in details. **[6]**

OR

Q4) a) Write down the purpose of defect management system and defect repository in details. **[6]**

b) Consider any e Commerce website and write any 6 test cases for online money (payment) transaction. **[6]**

Q5) a) Consider to check given number is even or odd number and calculate Statement coverage and path coverage. **[6]**

b) Draw a CFG for Fibonacci series and calculate Cyclomatic complexity. **[5]**

OR

P.T.O.

Q6) a) What is Black Box testing? Explain Requirement Traceability Matrix and positive and negative testing in details. **[6]**

b) What are the need of User Documentation Testing? **[5]**

Q7) a) What is specification based testing? Explain in detail. **[6]**

b) Explain the concept of usability testing with suitable example. **[6]**

OR

Q8) a) Elaborate the usage of various Regression testing Techniques in details **[6]**

b) What is Ad hoc Testing? Explain the advantages and disadvantages of it. **[6]**

Q9) a) Can automation testing replace manual testing? Justify your answer **[6]**

b) What do you know about different types of Automation Testing? **[6]**

OR

Q10)a) Write a note on : **[6]**

i) Cypress

ii) Protractor

b) What do you think Automation testing is good than manual testing? Justify your answer. **[6]**

Q11)a) What is Selenium? Explain Selenium IDE in details. **[6]**

b) What is the purpose of WebDriver in Selenium? **[5]**

OR

Q12)a) Write a short note on design and architecture for automation. **[6]**

b) List out any 5 Features of Selenium's Tool Suite in details. **[5]**

Total No. of Questions : 12]

SEAT No. : ____

PD-5261

[Total No. of Pages : 3

[6406]-2010R
F.Y. M.C.A.
DISCRETE MATHEMATICS AND STATISTICS
(2020 Pattern) (Semester - I) (310901)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Answer Q. 1 or Q. 2, Q. 3 or Q.4, Q.5 or Q.6 , Q.7 or Q.8, Q.9 or Q.10 and Q.11 or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Among a group of people, 40% liked red, 30% liked blue and 30% linked green. 7% liked both red and green. 5% liked both red and blue. 10% liked both green and blue. If 86% of them liked at least one colour, what percentage of people liked all three? **[6]**

b) Write the following statements in symbolic forms : **[5]**

i) I will go to a movie only if I will not study discrete structures

ii) If I finish my homework before dinner and it does not rain, then I will go to the ball game

iii) Either the food is good or service is good, but not both

OR

Q2) a) What is Relations and explain their properties. **[6]**

b) i) Is $(p \wedge q) \rightarrow p$ Is it tautology or contradiction?

ii) $x \rightarrow (x \vee y)$ Is it tautology or contradiction? **[5]**

Q3) a) If $F : A \rightarrow B$ and R is relation defined on set. Prove that F is bijective also find its inverse if $f(x) = 2x+3$ **[6]**

b) Given relation R = {(1, 2), (2, 3), (3, 4), (2, 1)} on A = {1, 2, 3, 4}. Find the transitive closure of R by Warshall's algorithm. **[6]**

OR

Q4) a) If x = {1, 2, 3, ... 7} and R = {(x, y) |x–y is divisible by 3}. Show that R is an equivalence relation. Draw the diagraph of R. **[6]**

b) Let $f(x) = 2x + 3$. $g(x) = 3x + 4$, $h(x) = 4x$ for $x \in R$. where R = set of all real numbers. Find gof, fog, foh, hof, goh, hog. **[6]**

P.T.O.

Q5) a) How many different seven persons committee can be formed each containing 3 women from an available set of 20 women and 4 men from an available set of 30 men? **[6]**

b) Solve the following : **[6]**

i) How many different car number plates are possible with 2 letters followed by 3 digits.

ii) How many of these number plates begin with 'MH'

OR

Q6) a) How many arrangements of the word INSTRUCTOR are there in which there are exactly two consonants between successive pairs of vowels? **[6]**

b) Suppose repetitions are not possible. **[6]**

i) How many three digit numbers can be formed from six digits 2,3,4,5,7,9,

ii) How many of these numbers are less than 400?

iii) How many numbers are even?

iv) How many are multiple of 5?

Q7) a) Prove Bayes Theorem. **[6]**

b) What is event? Explain types of it. **[5]**

OR

Q8) a) What is probability? Explain Axioms of probability. **[6]**

b) A survey was done for publishing two news paper. It was observed that 52% reads newspaper A and 35% reads news paper B. 8% reads both paper. If one person is chosen at random then what is probability that he reads at least one news paper. Also find probability if he doesn't reads any news paper. **[5]**

Q9) a) What is Sampling? Explain types of it. **[6]**

b) Write note on : **[6]**

i) Population

ii) Sample space

OR

Q10)a) Explain Co-relation, regression and their methods. **[6]**

b) Compute the mean Deviation about mean, median and mode from the following data 0,2,3,5,5,6,7,8,9,10,11 **[6]**

Q11)a) What is hypothesis testing? What are the advantages and disadvantages of it. **[6]**

b) Explain Geometric Distribution. **[6]**

OR

Q12)a) Write note on : **[6]**

i) Random Variables

ii) Discrete probability densities

b) 10 coins are to be tossed simultaneously. According to binomial distribution find the probability that there will be **[6]**

i) Exactly 5 heads

ii) At least 8 heads

iii) not more than 3 heads

♦ ♦ ♦

Total No. of Questions : 12]

SEAT No. : [ ]

PD5246

[Total No. of Pages : 2

[6406]-2011
F.Y.M.C.A (Engineering)
DATA STRUCTURES AND ALGORITHMS
(2020 Pattern) (Semester - I) (310902)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer all questions.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) What is problem Solving? Explain the following Algorithmic Strategies. **[6]**
   i) Divide and Conquer, and
   ii) Greedy strategy

b) Explain the Storage representations row major and column major and their address calculation with example. **[6]**

OR

Q2) a) Explain multidimensional arrays concepts? Explain row major and column major representation of 2-D array storage. **[6]**

b) Write short notes on: **[6]**
   i) Time complexity of algorithm
   ii) Space complexity of algorithm

Q3) a) Explain Linked List Data structure with diagram and its applications? **[6]**

b) Write C/C++ code for insert operations in singly linked list? Explain steps of programs with diagram. **[6]**

OR

Q4) a) With the diagrammatic representation explain the addition of polynomial using Linked list **[6]**
   i) $3\times3+4\times2+x$
   ii) $-10\times1-5x$

b) How circular list are advantageous than singly linked list? Explain working of circular linked list with diagram? **[6]**

Q5) a) Write C/C++ code to implement stack using sequential organization. Explain steps. **[6]**

b) How stacks are useful to implement using recursion process? Explain with application. **[5]**

OR

P.T.O.

Q6) a) Write different types of Queue data structures with its applications? **[6]**

b) What is priority queue? Explain its array implementation? **[5]**

Q7) a) Explain the different tree traversal algorithm with example. **[6]**

b) Explain application of tree as expression tree with example. **[6]**

OR

Q8) a) Build the AVL tree for the following data. Show the step by step construction 25, 12, 17, 30, 15, 14, 37, 27, 40, 29, 28. **[6]**

b) Define following terms. **[6]**

i) Binary Search Tree

ii) Degree of a node

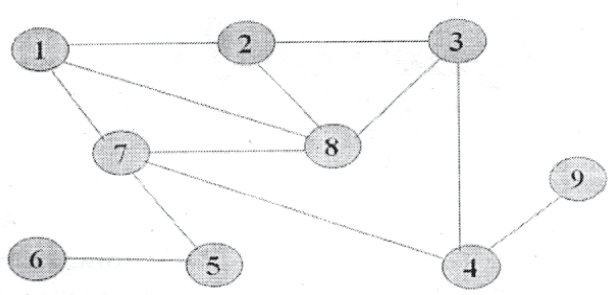
iii) Height of a node

Q9) a) Explain representation of Graph using Adjacency matrix and Adjacency list . **[6]**

b) Explain the minimum cost spanning tree-Prims and Kruskal Algorithms with suitable example. **[6]**

OR

Q10)a) Define DFS and BFS for a graph. Show BFS and DFS for the following graph with starting vertex as I. **[6]**



b) Explain prim's Algorithms with suitable example. **[6]**

Q11)a) Explain quick sort and sort the given list using quick sort: **[6]**
39, 09, 81, 45, 90, 27, 72, 18

b) Write a C/C++ non recursive function for binary search. **[5]**

OR

Q12)a) Show the stepwise execution of the Insertion sort algorithm for the following list. 17, 24, 49, 7, 8, 67, 23. **[6]**

b) Explain Fibonacci search with suitable example. **[5]**

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Total No. of Questions : 12]

SEAT No. : ____

PD-5247

[Total No. of Pages : 2

[6406]-2012

F.Y. M.C.A. (Engineering)

OBJECT ORIENTED PROGRAMMING

(2020 Pattern) (Semester - I) (310903)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right indicate full marks.***

Q1) a) What are the advantages and benefits of Object-Oriented Programming. **[6]**

b) Compare C & C++ platforms. **[6]**

OR

Q2) a) Write down the Syntax and Structure of C++ Programming language. **[6]**

b) Write a note on Four pillars of OOP. **[6]**

Q3) a) Write an OOP to add two complex numbers using copy constructor concept. **[5]**

b) Create a class staff having fields: Staff_id, name, salary. Write a menu driven program for : **[6]**

i) To accept the data

ii) To display the data

OR

Q4) a) Write a note on Constructor & Destructor. **[6]**

b) What is object? Explain its role in OOP. **[5]**

Q5) a) What is an operator overloading? List out the Pitfalls of Operator Overloading. **[6]**

b) Explain two types of polymorphism . **[6]**

OR

P.T.O.

Q6) a) Differentiate between multiple and multilevel inheritance in C++? **[6]**

b) We know that a private member of a base class is not inhertiable. Is it anyway possible for the objects of a derived class to access the private members of the base class? If yes, how? Remember, the base class cannot be modified. **[6]**

Q7) a) What is the use of Friend function, explain with examples. **[6]**

b) What is virtual function? Why do we need virtual functions? **[5]**

OR

Q8) a) Illustrate the concept of dynamic binding with suitable example. **[6]**

b) Explain the concept of this pointer. **[5]**

Q9) a) How many types of templates are there in C++? Explain with example **[6]**

b) Write a Program to find Largest among two numbers using function template. **[6]**

OR

Q10) a) Explain how exception handling mechanism can be used for debugging a program. **[6]**

b) What is generic programming? How is it implemented in C++? **[6]**

Q11) a) Discuss the various forms of get() function supported by the input stream. How are they used? **[6]**

b) What is a file mode? Describe the various file mode options available. **[6]**

OR

Q12) a) What is input stream and output stream? Explain various methods to open a file. **[6]**

b) Write a note on - seek(), tellp(), getline(). **[6]**



Total No. of Questions : 12]

SEAT No. :

PD-5248

[Total No. of Pages : 2

[6406]-2013

F.Y. M.C.A. (Engineering)

SOFTWARE ENGINEERING & PROJECT MANAGEMENT

(2020 Pattern) (Semester - I) (310904)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right indicate full marks.***
3) ***Assume Suitable data if necessary.***

Q1) a) Write note on Clean room software engineering. **[6]**

b) Explain Personal & Team Process Model. **[6]**

OR

Q2) a) Explain all levels of CMM. **[6]**

b) Explain the concept of verification and Validation. **[6]**

Q3) a) How to prioritize software requirements based on Knao Analysis? **[6]**

b) Explain the use of Use case diagram in Requirement Engineering. **[6]**

OR

Q4) a) Explain class diagram with example. **[6]**

b) Draw state diagram for ATM operations. **[6]**

Q5) a) Write short note on following: **[6]**

i) Pair programming

ii) Test Driven development

b) Explain Agile methodology for project development? **[5]**

OR

Q6) a) Write the manifesto for agile software development. **[6]**

b) Explain SCRUM - process flow and scrum roles. **[5]**

P.T.O.

Q7) a) What is the need to project estimation? What are the steps to estimate software. **[6]**

b) Short note on Gantt charts with example. **[6]**

OR

Q8) a) Explain basic principles which guide software project scheduling. **[6]**

b) Short note on Work break down structure with example. **[6]**

Q9) a) What do you mean by risk identification? How will you assess overall project risk. **[6]**

b) Short note on SCM (Software Configuration Management). **[6]**

OR

Q10) a) What is the necessity of risk monitoring? What is its impact on overall development? **[6]**

b) Short note on Business Process Reengineering. **[6]**

Q11) a) Explain Democratic and Autocratic leadership style. **[6]**

b) Short note on Code of Ethics and Code of conduct. **[5]**

OR

Q12) a) Explain Delegative leadership and Authoritative leadership. **[6]**

b) Short note on Ethical Leadership. **[5]**



Total No. of Questions : 12]

SEAT No. :

PD-5249

[Total No. of Pages : 3

[6406]-2014
F.Y. M.C.A. (Engineering)
INFORMATION SYSTEMS AND ENGINEERING ECONOMICS
(2020 Pattern) (Semester - I) (310905)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Solve Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8, Q9 or Q10, Q11 or Q12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data if necessary.***

Q1) a) Explain Role of Information system in organization with suitable example. **[6]**

b) What are the main functions of Management? Discuss them in the order of their importance to an Organization. **[6]**

OR

Q2) a) Write short note on : Memorandum of Association (MOA) and Articles of Association (AOA) **[6]**

b) Briefly explain features of Management. **[6]**

Q3) a) Explain knowledge management system? **[6]**

b) What do you mean Leveraging Information Systems? **[6]**

OR

Q4) a) Briefly Explain Project Management. **[6]**

b) Write a short note on ICT for Development E-Governance. **[6]**

Q5) a) What is Customer Relationship Management? Explain the challenges in Customer Relationship Management. **[6]**

b) Write a short note on - Supply Chain Management (SCM). **[5]**

OR

Q6) a) Define MIS, Explain Role of MIS, Structure of MIS based on management activity and functions. **[6]**

b) Explain Structure of MIS based on Social activity? **[5]**

P.T.O.

Q7) a) Explain different types of Decision making environment with example. **[6]**

b) Write short note on - Herbert Simpson's Model. **[6]**

OR

Q8) a) Explain Decision Making tools. **[6]**

b) Explain Bonded Rationality in detail. **[6]**

Q9) a) Journalize the following transaction in the books of Mr. Prakash : **[6]**

Date	Particulars
2012 April 1	Mr. Prakash started business with Cash Rs.80,000
2012 April 2	Purchased goods from Mona Rs.28,000
2012 April 7	Deposited cash into Dena Bank Rs.39,000.
2012 April 10	Sold goods to Dinesh Rs.41,000
2012 April 13	Purchased Laptop of Rs 30,000 in cash
2012 April 17	Paid Mona by Cheque Rs.30,000

b) Explain the various accounting principles and conventions **[6]**

OR

Q10)a) Prepare Balance Sheet from the following information **[7]**

XYZ Traders Trial Balance as at 31st March 2022

A/c Head	**Dr.(Rs.)**	**Cr.(Rs.)**
Capital		2,50,000
Cash in Hand	40,000	
Cash at Bank	30,000	
Closing Stock	20,000	
Fixed Assets	1,80,000	
Bills Receivable	21,000	
Bills Payable		2000
Sundry Debtor	52,000	
Sundry Creditor		25,000
Liabilities for expenses		10,000
Drawings	12,000	
Investments	15,000	
P&L A/c		70,000
Bank Overdraft		13,000
TOTAL	3,70,000	3,70,000

b) Differentiate between Book Keeping and Accounting. **[5]**

Q11)a) Assuming that the cost structure and selling price remain the same in periods I and II find out. **[6]**

Period	Sales Rs.	Profit Rs.
I	1,20,000	9,000
II	1,40,000	13,000

i) Profit volume ratio.

ii) Break even point

iii) Profit when sales are Rs.1,00,000

b) Balance Sheet as at 31st March 2021 **[5]**

Liabilities	Rs.	Assets	Rs.
Paid up Capital	3,00,000	Land & Building	92,150
General Reserve	55,000	Machinery	1,28,600
Profit and Loss Account	6,750		
Sundary Creditors	26,000	Stock in hand	1,28,200
Provision for depreciation	55,750	Debtors	1,25,000
Provision for taxation	9,250	Prepaid Expenses	1500
Proposed Dividends	15,000	Cash in hand	250
Bank Overdraft	38,000		
TOTAL	5,05,750	TOTAL	5,05,750

Calculate

i) Current Ratio

ii) Liquid Ratio

iii) Proprietors Ratio

OR

Q12)a) Explain the importance of ratio Analysis in brief. **[6]**

b) What are different elements of Cost? Explain in brief. **[5]**

Total No. of Questions : 12]

SEAT No. : ____

PD5263

[Total No. of Pages : 2

[6406]-2015R
First Year M.C.A (Engineering)
DATA BASE MANAGEMENT SYSTEM
(2020 Pattern) (Semester - II) (310912)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q.1or Q.2, Q.3or Q.4, Q.5or Q.6, Q.7or Q.8, Q.9or Q.10, Q.11or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Explain DBMS Architecture with proper diagram. **[6]**

b) Explain: **[6]**
- i) Entity
- ii) Attributes
- iii) Keys
- iv) Constraints
- v) Relationships
- vi) Cardinality

OR

Q2) a) Distinguish between DBMS and File Processing System. **[6]**

b) What is ER Model? Define Entity Attributes & Relationships with neat diagram. **[6]**

Q3) a) What is DDL? Explain all DDL Commands with example. **[6]**

b) What is trigger? Explain types of triggers with example. **[6]**

OR

Q4) a) What are joins in SQL? Explain types of joins with suitable example. **[6]**

b) Write a cursor which will update the employee salary by 5,000 and display the count of employees received the increment. **[6]**

Q5) a) Explain any 6 CODD's rules in detail. **[6]**

b) State the features of good relational design. **[5]**

OR

Q6) a) What is Referential integrity? Explain it with suitable example. **[6]**

b) What is Normalization? Explain BCNF with suitable example. **[5]**

P.T.O.

Q7) a) Explain transaction management in detail. **[6]**

b) Explain the concept of deadlocks with proper example. **[6]**

OR

Q8) a) State & Explain ACID Properties of transactions with suitable example. **[6]**

b) Explain Log-based Recovery method in detail. **[6]**

Q9) a) What are Parallel databases? Explain Shared Memory Architecture in detail. **[6]**

b) Explain Concurrency Control in Distributed Database. **[6]**

OR

Q10)a) Give the Difference between Parallel and Distributed databases. **[6]**

b) Write a short note on Speed up and scale up. **[6]**

Q11)a) Explain Hbase Architecture. **[6]**

b) What is NoSQL explain benefits and drawbacks of NoSQL. **[5]**

OR

Q12)a) What is Hadoop? Explain components of Hadoop. **[6]**

b) What is Big data? Explain 5V's of Big data in detail. **[5]**

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Total No. of Questions : 12]

SEAT No. : [ ]

PD5251

[Total No. of Pages : 2

[6406]-2016
First Year M.C.A (Engineering)
COMPUTER NETWORK
(2020 Pattern) (Semester - II) (310913)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Define Network Types and give an example. **[6]**

b) Compare and contrast the OSI model and the TCP/IP model. **[6]**

OR

Q2) a) Explain Manchester and differential Manchester encoding scheme. **[6]**

b) Draw OSI model and Explain duties of all the 7 layers of OSI model in data transmission. **[6]**

Q3) a) Explain WAN Connectivity protocols. **[6]**

b) Describe flow control mechanisms. **[6]**

OR

Q4) a) Discuss the Services to Network Layer in detail. **[6]**

b) Compare and contrast the methods of error detection and correction including parity bits, Hamming codes (11/12-bits), and CRC (Cyclic Redundancy Check.) **[6]**

Q5) a) Define the two main types of channel allocation methods used in communication networks. **[6]**

b) Illustrating the use of WDMA (Wavelength Division Multiple Access) in a fiberoptic communication network. **[5]**

OR

Q6) a) Compare and contrast multiple access protocols including Pure ALOHA, Slotted ALOHA and CSMA (Carrier Sense Multiple Access). **[6]**

b) State the difference between IEEE 802.3 (Ethernet) and IEEE 802.11 (Wi-Fi) standards in terms of their frame formats. **[5]**

P.T.O.

Q7) a) Explain routing in MANET. **[6]**

b) Define ICMP. Explain in detail how it is use. **[6]**

OR

Q8) a) Explain working of RIP and OSPF in detail. **[6]**

b) Write a short note on Mobile IP. **[6]**

Q9) a) Explain working of RTP and SCTP. **[6]**

b) List and define the primary services provided by the Transport Layer in the OSI model. **[6]**

OR

Q10)a) How TCP timer management is done? Give brief idea about TCP congestion control. **[6]**

b) Define Berkley Socket. Explain how it is used for data transmission? **[6]**

Q11)a) Explain application layer protocols. **[6]**

b) Illustrate the use of DNS (Domain Name System) in a web browsing application. **[5]**

OR

Q12)a) Discuss the functionalities of FTP (File Transfer Protocol), TFTP (Trivial File Transfer Protocol) and TELNET in network communication. **[6]**

b) Explain the role of DHCP in network communication. **[5]**

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Total No. of Questions : 12]

SEAT No. :

PD5252

[Total No. of Pages : 2

[6406]-2017

First Year M.C.A. (Engineering)

JAVA PROGRAMMING

(2020 Pattern) (Semester-II) (310914)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, or Q.11or Q.12.***
2) ***Neat diagrams must be drawn whenever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) Explain exception handling in Java with example. **[6]**

b) What is difference between JDK, JRF and JVM? **[6]**

OR

Q2) a) What is the difference between final, finally and finalize methods? **[6]**

b) Differentiate method overloading and method overriding with example. **[6]**

Q3) a) What is usage of package in Java? How are they created? **[6]**

b) What is thread priority? How can it be set for thread? **[6]**

OR

Q4) a) Explain life cycle of thread with example. **[6]**

b) Distinguish between Outputstream and Writer class. **[6]**

Q5) a) What are different Layout managers? Explain Grid Layout in detail. **[6]**

b) Write a program using applet to draw oval and rectangle. **[5]**

OR

P.T.O.

Q6) a) What are similarities and dissimilarities between Swing and AWT? **[6]**

b) Explain various methods of applet class. **[5]**

Q7) a) Write a java program to create an application which will perform following operation on employee data. (using JDBC). **[6]**

i) Insert

ii) update

iii) delete

b) Illustrate the interfaces of JDBC API. **[6]**

OR

Q8) a) Write a note on JDBC Architecture. **[6]**

b) Write a program to create database of student using information such as name, roll no, marks of 5 subject, percentage etc. Program should display list all the student. **[6]**

Q9) a) Write a note on Java Networking. **[6]**

b) Describe any 3 Classes of java.net Package. **[6]**

OR

Q10)a) Write a note on Datagram Server & Client. **[6]**

b) What is class URL? What is the difference between URL and URL connections? **[6]**

Q11)a) Explain Servlet Life cycle. **[6]**

b) Explain expression and declaration tags in JSP. **[5]**

OR

Q12)a) Write a difference between Servlet and JSP. **[6]**

b) Explain the architecture of JSP. **[5]**



Total No. of Questions : 12]

SEAT No. :

PD5253

[Total No. of Pages : 2

[6406]-2018
F.Y.M.C.A. (Engineering)
OPERATING SYSTEMS
(2020 Pattern) (Semester - II) (310915)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.***
2) ***All questions are compulsory.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) What are the 4 major types of operating system? When was the first operating system developed? **[6]**

b) What are the functions of OS? **[6]**

OR

Q2) a) What is OS structure? Explain with diagram. **[6]**

b) What are the 5 characteristics of operating system? What is the kernel in operating system? **[6]**

Q3) a) What are the different states in a process? **[6]**

b) What are the types of threads in operating system? **[6]**

OR

Q4) a) What are the types of scheduler? **[6]**

b) Consider the following set of process with CPU burst time given in milliseconds. **[6]**

Process	Burst Time	Arrival Time
P1	5	1
P2	3	0
P3	2	2
P4	4	3
P5	8	2

Illustrate the execution of these process using FCFS and preemptive SJF. Calculate average turn around time and average waiting time.

Q5) a) What is mutual exclusion explain with example? How does mutual exclusion cause deadlock? **[6]**

b) How can deadlock be prevented? **[5]**

OR

P.T.O.

Q6) a) What are the 4 conditions required for deadlock to occur? **[6]**

b) Explain Readers/Writers Problem of OS? **[5]**

Q7) a) What is the concept of Virtual Memory? Explain concept of logical and physical addresses. **[6]**

b) Explain demand paging and steps in handling a page fault. **[6]**

OR

Q8) a) Consider the following page reference string 1, 2, 3, 4, 2, 1, 5, 6, 1, 2, 3, 7 Numbers of page frames are three. Show the page trace and calculate the number of page faults for the following page reference schemes: **[6]**

i) LRU

ii) Optimal

b) Explain the following with respect to memory management. **[6]**

i) Compaction

ii) Fragmentation

iii) Swapping

Q9) a) Explain any 4 file access methods. **[6]**

b) What are the different issues related to disk performance? Explain any on disk scheduling algorithm. **[6]**

OR

Q10)a) Explain the concept of file protection, What are the different access rights given to a file? **[8]**

b) Describe structure of Disk? **[4]**

Q11)a) Comment on process scheduling in Linux. Which algorithms are used in Linux for scheduling? **[5]**

b) Explain the following components of Linux File system: **[6]**

i) Kernel

ii) System Libraries

iii) System Utilities

OR

Q12)a) Explain Linux file system. What are different file types? **[5]**

b) Explain following commands with example: **[6]**

i) grep

ii) find

iii) banner



Total No. of Questions : 12]

SEAT No. : [ ]

PD5254

[Total No. of Pages : 2

[6406]-2019
F.Y.M.C.A.(Engineering)
MOBILE COMPUTING
(2020 Pattern) (Semester - II) (310916)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answers Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) Explain Source Encoding, Channel Encoding and Modulation with one example. **[6]**

b) Explain the generations of Cellular network (1G, 2G, 2.5G, 3G, 4G) with respective standards. **[6]**

OR

Q2) a) Explain WAP in detail. **[6]**

b) Explain Mobile IP. **[6]**

Q3) a) Explain Wireless multiple access protocols. **[6]**

b) Write in brief Wireless networking. **[6]**

OR

Q4) a) Explain mobility Databases. **[6]**

b) What is MAC issues in detail. **[6]**

Q5) a) Explain data replication for mobile computers. **[6]**

b) Explain File system in Mobile computers. **[5]**

OR

Q6) a) Write in brief adaptive clustering for mobile wireless networks. **[6]**

b) Explain Mobile data management issues. **[5]**

P.T.O.

Q7) a) Explain J2ME. **[6]**

b) Explain Palm OS **[6]**

OR

Q8) a) Compare the features mobile OS: windows and android. **[6]**

b) Explain about UI layout of android. State the types of layout. Explain in brief two of them. **[6]**

Q9) a) Explain file structure in android OS. **[6]**

b) Explain File Management tools of Android OS. **[6]**

OR

Q10)a) Write note on Android Application. **[6]**

b) Explain retrieval and Sharing: File system in android **[6]**

Q11)a) Explain GTalk service. **[6]**

b) Explain in brief SQLite database. **[5]**

OR

Q12)a) Explain manage network and Wi-Fi connections. **[6]**

b) Explain Android Hardware in details. **[5]**

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Total No. of Questions : 12]

SEAT No. : [ ]

PD-5255

[Total No. of Pages : 3

[6406]-2020

F.Y. M.C.A. (Engineering)

ARTIFICIAL INTELLIGENCE

(2020 Pattern) (Semester - II) (310916B) (Elective - I)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates :

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Assume Suitable data if necessary.***

Q1) a) What is AI? Describe the applications of Artificial Intelligence. **[6]**

b) What is Agent Environment in AI? Describe the features of environment. **[6]**

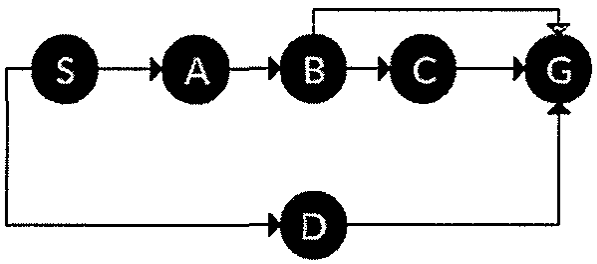
OR

Q2) a) What are Intelligent agents? Explain Simple Reflex Agent with suitable diagram. **[6]**

b) Explain the structure of Agents and how the components of agent programs work? **[6]**

Q3) a) What is searching in AI? What are the different Uninformed Search Strategies? **[6]**

b) Which solution would Depth First Search find to move from node S to node G if run on the graph below? **[6]**

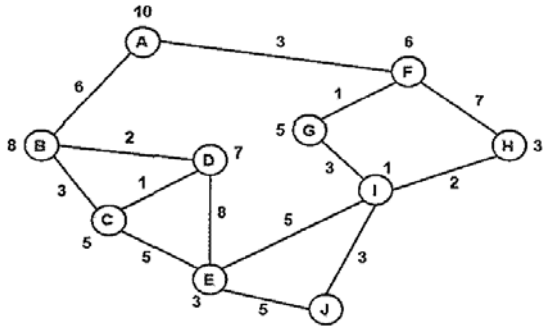


OR

P.T.O.

Q4) a) Describe in brief different Heuristic Search Strategies? **[6]**

b) Consider the following graph. The numbers written on edges represent the distance between the nodes. The numbers written on nodes represent the heuristic value. Find the most cost-effective path to reach from start state A to final state J using A* Algorithm. **[6]**



Q5) a) What is knowledge representation? Explain various techniques of knowledge representation. **[6]**

b) What properties a Good Knowledge Representation System should have? **[5]**

OR

Q6) a) What are the drawbacks of propositional logic used in representation of facts? **[6]**

b) What is the roll of TMS (truth maintenance system) in Knowledge Representation? **[5]**

Q7) a) What is planning in AI? Explain the Role of Planning in Artificial Intelligence? **[6]**

b) What is a Plan? Explain Backward & Forward planning. **[6]**

OR

Q8) a) What is the difference in Search vs. planning? Explain the Components of the planning system. **[6]**

b) Write a short note on : **[6]**

i) Nonlinear planning using constraint posting

ii) Hierarchical planning

Q9) a) What is Learning in AI? Explain various learning methods. **[6]**

b) Explain the working of Feedforward Networks with suitable diagram. **[6]**

OR

Q10) a) What is ANN? Describe the basic components of ANN with the help of diagram. **[6]**

b) How the backpropagation algorithm works? Explain with suitable diagram. **[6]**

Q11) a) Describe the utilization and functionality of Expert systems. **[6]**

b) Explain the Architecture of Expert system in detail. **[5]**

OR

Q12) a) What is Expert System? Describe the components of expert system. **[6]**

b) Describe the steps for building expert system. **[5]**

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Total No. of Questions : 12]

SEAT No. :

PD5256

[Total No. of Pages : 2

[6406]-2021
First Year M.C.A. (Engineering)
CYBER SECURITY
(2020 Pattern) (Semester - II) (310916 C) (Elective - I)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answers Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) Explain the Challenges and Constraints of Internet Governance. **[6]**

b) Explain the Need for a Comprehensive Cyber Security Policy. **[6]**

OR

Q2) Explain in details Cyber Threats. **[12]**

Q3) a) Explain the Complex Network Architectures in Vulnerabilities and Access Control. **[6]**

b) Explain the Poor Cyber Security Awareness. **[6]**

OR

Q4) a) Explain the Access control, Audit, Authentication of Cyber Security Safeguards. **[6]**

b) Explain the Intrusion Detection Systems. **[6]**

Q5) a) Explain the Intrusion, Physical Theft in cyber security. **[6]**

b) Explain the abuse of Privileges in cyber security. **[5]**

OR

Q6) a) Explain the Intrusion detection and Prevention Techniques. **[6]**

b) Explain the malware infection. **[5]**

P.T.O.

Q7) a) What is cryptography? Explain the concept of Symmetric key Cryptography with a suitable example. **[6]**

b) Write a short note on **[6]**

i) Digital Signature

ii) Message Authentication

OR

Q8) a) What is a firewall? How it functions? Explain its types in detail. **[6]**

b) What is VPN? Explain Security at application layer and transport layer. **[6]**

Q9) a) What is cyber space? Explain Indian Cyber space. **[6]**

b) Discuss various cyber security regulations and standards in detail. **[6]**

OR

Q10)a) Explain the details of National Cyber Security Policy 2013. **[6]**

b) What is the role of private sector and International law in cyber space? **[6]**

Q11)a) What is cyber forensics? How preliminary investigations are handled in it? **[6]**

b) Explain how disk based analysis is conducted? **[5]**

OR

Q12)a) Explain how the E-mails are scrutinized and validated with a suitable example. **[6]**

b) Write a short note on: **[5]**

i) Tracing Internet Access

ii) Tracing memory in real time.

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Total No. of Questions : 12]

SEAT No. : [ ]

PD5257

[Total No. of Pages : 2

[6406]-2022
F.Y.M.C.A. (Engineering)
BLOCK CHAIN
(2020 Pattern) (Semester - II) (310916 D) (Elective-I)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11or Q.12.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) a) Explain the advantages and challenges of implementing a distributed database architecture? **[6]**

b) How do Byzantine Fault Tolerance (BFT) algorithms enable distributed systems to withstand malicious attacks and node failures? **[6]**

OR

Q2) a) Write a short note on ECDSA (Elliptic Curve Digital Signature Algorithm). Explain how does it enable secure and verifiable digital signatures? **[6]**

b) How are Zero Knowledge Proofs utilized in blockchain? **[6]**

Q3) a) How does blockchain ensure data integrity, transparency and security compared to traditional databases? **[6]**

b) Write a short note on Merkle Patricia Tree (MPT) and also explain its efficient storage and verification of transactions. **[6]**

OR

Q4) a) Differentiate between private and public blockchains. **[6]**

b) What factors contribute to the success, adoption and sustainability of a blockchain application. **[6]**

Q5) a) What is the Nakamoto consensus and how does it play a fundamental role in blockchain consensus mechanisms? **[6]**

b) What is Proof of Burn and how does it work as an alternative consensus mechanism in blockchain networks? **[5]**

OR

P.T.O.

Q6) a) How does Proof of Stake (PoS) differ from Proof of Work (PoW) in terms of consensus mechanism? **[6]**

b) What is a Sybil attack and how does it pose a threat to decentralized network? **[5]**

Q7) a) Explain the key milestones in the history of blockchain technology and its evolution. **[6]**

b) What is a distributed ledger and how does it differ from a traditional centralized ledger? **[6]**

OR

Q8) a) What is a DAO and how does it operate without centralized control or management? **[6]**

b) What is a smart contract, and how does it automate and enforce the terms of an agreement? **[6]**

Q9) a) Who are the primary stakeholders involved in the operation and governance of a blockchain network? **[6]**

b) What legal frameworks exist to protect investors and users of cryptocurrency exchanges? **[6]**

OR

Q10)a) Explain how the use of cryptocurrencies impacted the growth of black markets 40? **[6]**

b) How can blockchain technology enhance security and data integrity in IoT applications? **[6]**

Q11)a) Write a short note on Hyperledger Architecture along with a suitable diagram. **[6]**

b) What is the Membership Service Provider (MSP) and how does it handle identity and access control? **[5]**

OR

Q12)a) What is Hyperledger Fabric and how does it differ from other blockchain platforms like Ethereum? **[6]**

b) How are chaincode deployed, invoked and upgraded on a Hyperledger Fabric network? **[5]**

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