PAPER ID-410850

Roll No: | | | | | | | | | | | | | |

MCA (INTEGRATED)
(SEM V) THEORY EXAMINATION 2021-22
DESIGN & ANALYSIS OF ALGORITHMS

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

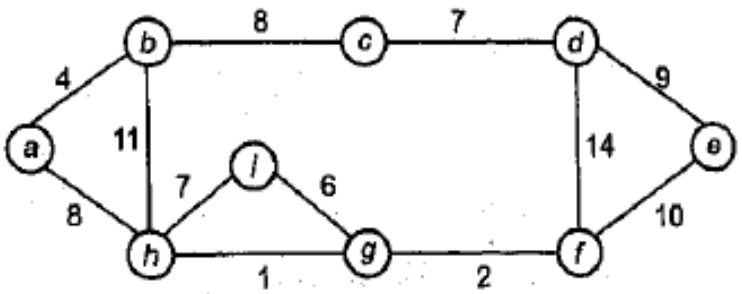
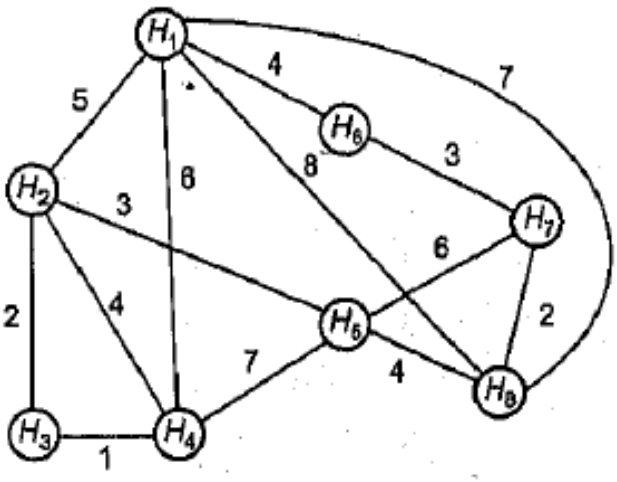
SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a.	What is an Algorithm?
b.	What are the advantages of Recursion?
c.	What do you mean by the running time of an algorithm?
d.	Solve the Recurrence using Master method $T(n) = 9T(n/3) + n$
e.	What do you understand by Divide and Conquer strategy?
f.	Differentiate between Polynomial and Exponential running time.
g.	What is a Minimal Spanning Tree?

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a.	How you analyze the Algorithm? What is the running time of an algorithm? How is it determined? Explain with example.
b.	What are various applications of Red Black Trees? Explain.
c.	Find the Minimum spanning tree of the Following Graph using Kruskals algorithm. 
d.	Apply the greedy Strategy to solve travelling salesman problem for the given graph. 
e.	What is the relationship among P, NP and NP complete problems? Show with the help of a diagram.

PAPER ID-410850

Roll No: | | | | | | | | | | | | | |

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a)	What do you mean by Asymptotic notation? Define Ω -notation, O- notation and θ- notation with examples.
(b)	Write an algorithm for Insertion sort. Find the time complexity of Insertion sort in all cases.

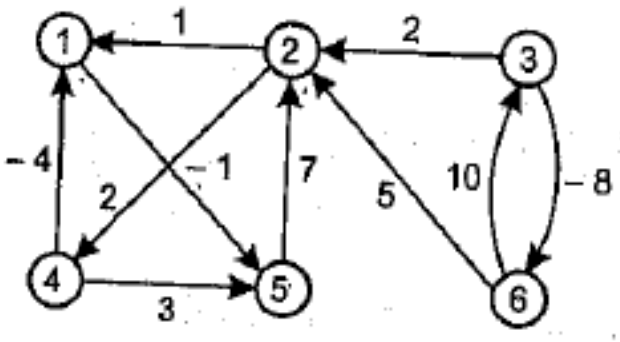
4. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Explain the B-Tree and differentiate between B-tree and Red Black Tree.
(b)	Write the procedure for building a Min Heap by taking suitable example.

5. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Differentiate between Greedy and Dynamic Programming Algorithms. Solve the 0-1 knapsack problem by greedy strategy.
(b)	Discuss n queen's problem. Solve 4 queen's problem using backtracking method?

6. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Illustrate Breadth First Search and Depth First Search by taking suitable example.
(b)	Apply Floyd-Warshall algorithm for constructing Shortest path for the given graph. Show the matrix D^k that result each iteration. 

7. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Explain Rabin-Karp algorithm for searching a Pattern in a Text. Explain with suitable example.
(b)	Explain Approximation and Randomized algorithms.

Subject Code: RCAI502

PAPER ID-410633

Roll No: | | | | | | | | | | | | | |

MCA (INTEGRATED)
(SEM V) THEORY EXAMINATION 2021-22
PROGRAMMING WITH MATLAB

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a.	Explain features of MATLAB in brief.
b.	Define ans, realmax, input and disp with example.
c.	Write a script to print a string in reverse order.
d.	What is meant by anonymous function?
e.	Why try-catch block is used? Briefly explain with example.
f.	Write a script to draw any two specialized two-dimensional plots.
g.	Write steps to find roots of a given equation in MATLAB.

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a.	Discuss various types of variables used in MATLAB.
b.	Explain steps to create one-dimensional, two-dimensional and multi-dimensional array in MATLAB with suitable example. Also write a program to sort an array of 10 numbers.
c.	Write program to demonstrate the use of nested functions.
d.	Write steps and program to draw a two-dimensional plot with following specifications- (i) X axis with 20 data points over $1 \leq x \leq 20$, Y axis contains sine of the data points in X (ii) Add title and labels to both axis (iii) Set color and line-style (iv) Highlight the data points with maximum and minimum values (v) Set axis limit on the current plot
e.	Write a program to perform all arithmetic operations on polynomials.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Explain any seven mathematical functions with example.
(b)	Discuss application areas of MATLAB.

4. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Create a two-dimensional 4 x 4 array and do the following- (i) Flip the array from left to right. (ii) Print elements of first three columns of first and second row (iii) Change the size of the array to 8 x 2 (iv) Print all elements of last row (v) Sort the elements of array in descending order (vi) Set last element of third row to zero

(b)	Explain any five multi-dimensional array manipulation functions with example.

5. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Define function. Explain rules and steps to create a function and sub-function.
(b)	What is switch-case statement? Write a program to check whether a given alphabet is vowel or not using switch-case.

6. Attempt any *one* part of the following: 7 x 1 = 7

(a)	How do you create subplots in MATLAB? Briefly explain with example.
(b)	Discuss different types of specialized three-dimensional plots with example.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Explain any seven statistical functions used in MATLAB with example.
(b)	Discuss steps and functions to find differentiation and integration of a given equation with example.

Subject Code: RCAI503

PAPER ID-410160

Roll No: | | | | | | | | | | | | | |

MCA (INTEGRATED)
(SEM V) THEORY EXAMINATION 2021-22
JAVA PROGRAMMING

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a.	Write short notes on ISDN & FTP?
b.	What is the difference between an Interface and an Abstract class?
c.	Differentiate between error and exception in java
d.	Difference between Swing and AWT?
e.	What is Socket in java?
f.	What is the use of RMI and RPC?
g.	Why JSP is basically used today?

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a.	Explain the working of following controls : i. Checkbox ii. Label iii. Textbox iv. ComboBox
b.	What is a user define package? How to create a package in java explain with suitable example?
c.	Explain Working of Java Virtual Machine (JVM). Also explain how Java is architectural neutral.
d.	Discuses characteristics of JDBC? What are the various steps for using JDBC? Write a program to demonstrate these steps.
e.	Define following in brief: i. Servlet Life Cycle ii. Debugging Servlet

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a)	What do you understand by Layout manager? Illustrate three type of layout available in Java with the help of suitable syntax.
(b)	What do you mean by Java Beans? Why beans are used in java. Explain the use of jar files in java.

4. Attempt any *one* part of the following: 7 x 1 = 7

(a)	By means of a diagram show the various streams found in the java.io package? Write a program to demonstrate how to use a stream Tokenizer to count the number of words in a file.
(b)	Discuses component and container in AWT? Explain with suitable example.

Roll No: | | | | | | | | | | | | | |

5. Attempt any *one* part of the following: 7 x 1 = 7

(a)	What is the mail difference between an application and applet? What are the advantages of Java swings over Java applets?
(b)	Explain the steps involved in Data Source Name creation. how many types of JDBC drivers are available in java.

6. Attempt any *one* part of the following: 7 x 1 = 7

(a)	What is an applet explain the life cycle of an applet with suitable example.
(b)	What is a string buffer? How does it differ from a string? Give the three ways of creating a string object.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a)	What is Servlet? Explain the life cycle of servlet.
(b)	Write short note on: i. Telnet ii. Gopher iii. SMTP iv. POP

Subject Code: RCAI504

PAPER ID-410386

Roll No: | | | | | | | | | | | | | |

MCA (INTEGRATED)
(SEM .V) THEORY EXAMINATION 2021-22
SYSTEM ANALYSIS & DESIGN

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a.	Differentiate between Open and Closed System?
b.	Explain the term Software Quality Assurance?
c.	What do you mean by Manual and automated system?
d.	Define the term Data Integrity?
e.	Define Decision Tables?
f.	What do you mean by Fact-Finding?
g.	What is reverse engineering?

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a.	What is DSS? Explain various components briefly with the help of suitable diagram?
b.	What is need of system Analysis? Explain the role of System Analyst?
c.	Give the difference between Top-down design and Bottom-up Design?
d.	What do you understand by System Cost? Explain COCOMA Model for determining total system cost?
e.	What is online transaction processing? Give an example of online transaction processing? Also differentiate between online transaction processing and batch processing?

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Discuss System Development Life Cycle Model with diagram?
(b)	Discuss the role of computer in information systems? Define strategic and operational planning with the help of diagram?

4. Attempt any *one* part of the following: 7 x 1 = 7

(a)	What is meant by System Design Specification? Explain the purpose of system design tools?
(b)	Explain the difference between Structured Analysis and Structured Design?

5. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Explain DFD in detailed with example of university? What are the different types of information gathering techniques? Explain Interview and its types?
(b)	What do you meant by interview and its advantages and disadvantages?

6. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Discuss the symbols used while describing a DFD and E-R diagram?
(b)	What fact-finding technique to use for investigating the information requirement of a large organisation? Explain fact-finding ethics? What are the sources that are used to gather information?

7. Attempt any *one* part of the following: 7 x 1 = 7

(a)	What do you mean System Performance? Give the between technical feasibility and behavioral feasibility with the help of example?
(b)	Explain the various Hardware and Software while developing a System?

PAPER ID-410029

Subject Code: RCAI505

Roll No: | | | | | | | | | | | | | |

MCA-Integrated
(SEM 5TH) THEORY EXAMINATION 2021-22
CYBER SECURITY

Time: 3 Hours ***Total Marks: 70***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

a.	Define the terms cryptography and cryptanalysis.
b.	What do you mean by Ethical Hacking?
c.	What do you mean by Information System?
d.	What do you mean DDoS Attack.
e.	What do you mean by Phishing Attack?
f.	Define IT Act 2000?
g.	What are Email security policies?

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a.	What is an encryption? Discuss the symmetric and asymmetric encryption methods?
b.	What is Malicious Software? Explain various types of Malicious Software.
c.	Write short Notes on the following:- i) Virus ii) Worms iii) Trojan Horse iv) Logic Bomb
d.	What are the primary measures applied for the security of backup?
e.	What is the process of developing Secure Information System? Discuss about main security considerations in developing secure information systems.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

(a)	Briefly explain various components of Information System?
(b)	What is Electronic Commerce? Discus various security threats to E-commerce.

4. Attempt any *one* part of the following: 7 x 1 = 7

(a)	What is Public Key Encryption? Discuss in detail.
(b)	Explain in detail the two common modes of paying money online i.e. E – Cash and E – Payment.

5. Attempt any *one* part of the following: 7 x 1 = 7

(a)	What are the limitations of E – Commerce?
(b)	Diagrammatically show the working of Biometric Technology.

6. Attempt any *one* part of the following: 7 x 1 = 7

(a)	What is Security Policy? Briefly explain Internet Security policies.
(b)	Describe the Intellectual Property Rights.

7. Attempt any *one* part of the following: 7 x 1 = 7

(a)	What do you mean by Physical Security? Explain different physical security controls.
(b)	What do you mean by Intrusion monitoring and detection (IDS)? Define its goals.