Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20MATP101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

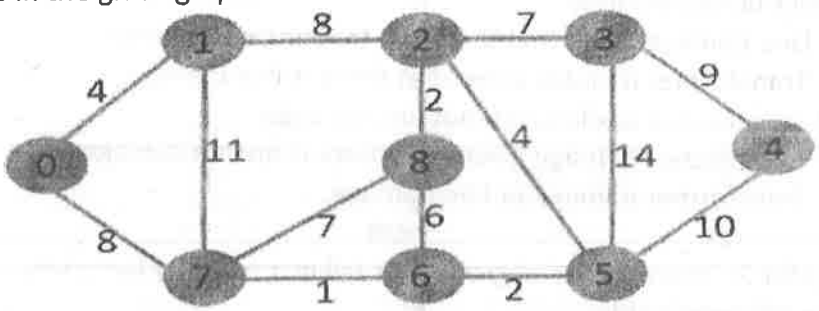
MCA I Year I Semester (R20) Regular & Supplementary End Semester Examinations – May 2022

MATHEMATICAL FOUNDATIONS FOR COMPUTER APPLICATIONS

Time: 3Hrs **Max Marks: 60**

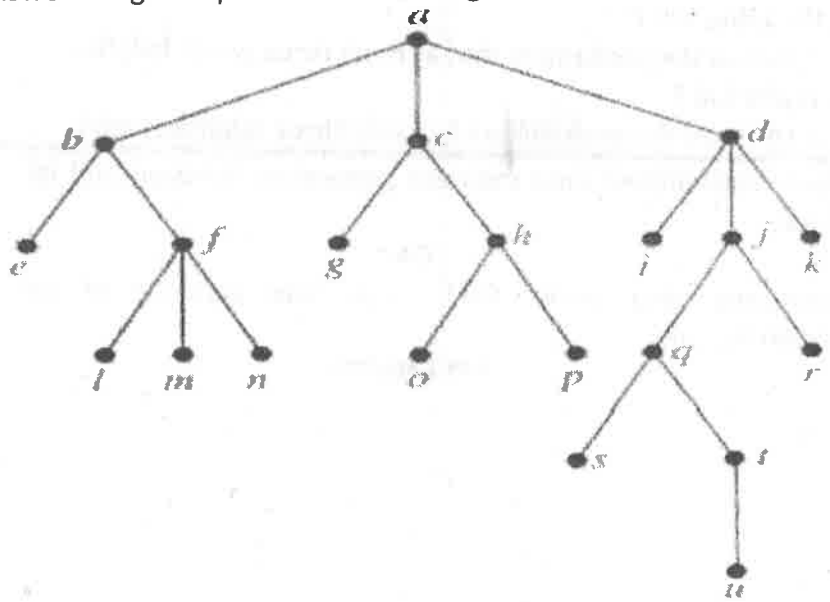
Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	i. If n = 30, S30 = {1, 2, 3, 5, 6, 10, 15, 30}. Let R denote the relation division. Then show by drawing the Hasse diagram that (S30, R) is a Lattice.	6M	1	3
	ii. Draw Hasse diagram of (P(A), ⊆) for A={a, b, c }.	6M	1	3
	OR			
Q.1(B)	Write the following definitions with suitable example: (a) Conditional (b) Biconditional (c) Tautology (d) Contradiction (e) Converse (f) Inverse (g) Contrapositive.	12M	1	2
Q.2(A)	Use Dijkstra's algorithm to find shortest paths from source '0' to all vertices in the given graph.	12M	2	4



OR

Q.2(B)	i. Explain in detail: The Construction of Prefix codes from a tree with example	12M	2	4
	ii. Answer the given questions from the given tree?			



a) Which vertex is the root?
b) Which vertices are internal?
c) Which vertices are leaves?
d) Which vertices are children of j?
e) Which vertex is the parent of h?
f) Which vertices are siblings of o?
g) Which vertices are ancestors of m?
h) Which vertices are descendants of b?

Q.3(A) Calculate coefficient of Skewness based on quartiles and comment on the nature of the data. 12M 3 3

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	52	68	85	92	100	95	70	28

OR

Q.3(B) Calculate the rank correlation coefficient for the following data: 12M 3 3

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

Q.4(A) Define conditional probability? Independence of events? In studying the causes of power failures, these data have been gathered: 5% are due to transformer damage, 80% are due to line damage, 1% involves both problems. Based on these percentages, approximate the probability that a given power failure involves: 12M 4 3

(i) Line damage given that there is a transformer damage
(ii) Transformer damage given that there is line damage
(iii) Transformer damage but not line damage
(iv) Transformer damage given that there is no line damage.
(v) Transformer damage or line damage.

OR

Q.4(B) Let density for X, the number of grafts that fail in a series of five trials, is given the following table: 12M 4 3

x	0	1	2	3	4	5
$f(x)$	0.7	0.2	0.05	0.03	0.01	$f(5)$

(a) Find $f(5)$?
(b) Find the table for F?
(c) Use F to find the probability that at most three grafts fail; that at least two grafts fail ?
(d) Use F to verify the probability of exactly three failures is 0.03.

Q.5(A) Define Poisson distribution? Find moment generating function and its mean, variance. 12M 5 4

OR

Q.5(B) Define exponential distribution. Find mean and variance of an exponential distribution. 12M 5 4

***** END*****

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Question Paper Code: 20MCAP101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA I Year I Semester (R20) Regular & Supplementary End Semester Examinations – May 2022

PROGRAMMING WITH C++

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	Differentiate Object Oriented Programming and Procedure Oriented Programming.	12M	1	4
	OR			
Q.1(B)	i) Write a C++ program to find maximum and minimum in n float elements using arrays.	6M	1	3
	ii) Write a C++ program to find two strings are anagram strings or not. (Anagram strings are if all the characters in two strings are same)	6M	1	3
Q.2(A)	i) Explain inline functions with suitable example program.	6M	2	2
	ii) Why we need friend functions in C++. Justify your answer with example.	6M	2	5
	OR			
Q.2(B)	What is constructor? Explain different types of constructors with suitable example program.	12M	2	1
Q.3(A)	Explain different forms of inheritance. Illustrate with an example each type with an example.	12M	3	2
	OR			
Q.3(B)	i) What is operator overloading? Write a C++ program illustrating overloading insertion and extraction operators?	8M	3	1
	ii) Write a C++ program illustrating the use of NEW and DELETE operators?	4M	3	3
Q.4(A)	i) What are virtual functions? Describe the rules for declaring virtual functions?	6M	4	2
	ii) Write a C++ program illustrating bubble sort using function templates?	6M	4	3
	OR			
Q.4(B)	Describe the three different inheritance behaviors achieved through the use of pure virtual, ordinary virtual and non-virtual functions?	12M	4	4
Q.5(A)	Explain the process of file concepts in C++ programming	12M	5	2
	OR			
Q.5(B)	Discuss about the importance of try, catch and throw keywords with suitable example program for each.	12M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20MCAP102

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA I Year I Semester (R20) Regular & Supplementary End Semester Examinations – May 2022

COMPUTER ORGANIZATION AND ARCHITECTURE

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	Subtract the following number using 1's and 2's complement: a) $(148)_{10} - (17)_8$ b) $(98)_{16} - (1000100)_2$	(12M)	1	3
	OR			
Q.1(B)	How encoder and decoder is used to perform parallel coding? Explain with suitable diagram.	(12M)	1	2
Q.2(A)	Differentiate between RISC and CISC.	(12M)	2	2
	OR			
Q.2(B)	Discuss in detail about instruction sets used in processing.	(12M)	2	2
Q.3(A)	How pipelining is performed in intel core i7 processor? Illustrate with sketch.	(12M)	3	2
	OR			
Q.3(B)	What is branch hazard? Describe the method for dealing with the branch hazard?	(12M)	3	2
Q.4(A)	Mention any six characteristics of primary and secondary memories.	(12M)	4	2
	OR			
Q.4(B)	Explain the internal organization of 2M*8 dynamic memory chip.	(12M)	4	2
Q.5(A)	Explain the memory organization in multiprocessors.	(12M)	5	2
	OR			
Q.5(B)	Write a note on inter process communications in a multiprocessor.	(12M)	5	2

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Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20MCAP103

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA I Year I Semester (R20) Regular & Supplementary End Semester Examinations – May 2022

OPERATING SYSTEMS

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either A or B only

		Marks	CO	BL
Q.1(A)	What is an operating system? Explain the Operating-System Services details.	12M	1	1
	OR			
Q.1(B)	Discuss any three CPU Scheduling Algorithms with suitable examples.	12M	1	3
Q.2(A)	Write about the various CPU scheduling algorithms.	12M	2	2
	OR			
Q.2(B)	Explain different types of process scheduling algorithms for example.	12M	2	2
Q.3(A)	What is Virtual Memory? Discuss the Demand Paging implementation with a neat diagram.	12M	3	2
	OR			
Q.3(B)	What is storage management? Explain the file access method briefly	12M	3	2
Q.4(A)	Explain the following in UNIX i. Grep command ii. Vi Editor	12M	4	2
	OR			
Q.4(B)	Briefly explain the AWK & SED features.	12M	4	2
Q.5(A)	Explain the following with examples i. pipes and filters in Unix ii. Quoting mechanism in Unix	6M 6M	5 5	2 2
	OR			
Q.5(B)	What are Control structures in Unix? Explain With an example.	12M	5	2

***** END*****

Hall Ticket No: | | | | | | | | | | |

Course Code: 20MCAP104

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA I Year I Semester (R20) Regular & Supplementary End Semester Examinations – May 2022

OBJECT ORIENTED SOFTWARE ENGINEERING

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	Define Software Engineering and explain Software Development life cycle.	12M	1	1
	OR			
Q.1(B)	a. Compare and contrast the difference between water fall model and prototype model. b. What is object orientation? Explain its characteristics.	12M	1	1
Q.2(A)	State and explain the Requirement Engineering.	12M	2	1
	OR			
Q.2(B)	a. What is Requirement Engineering? b. Discuss activities in Requirement Engineering.	12M	2	2
Q.3(A)	Discuss detail on Design notation and specification?	12M	3	2
	OR			
Q.3(B)	Consider any case study, draw the class diagram and discuss.	12M	3	2
Q.4(A)	State and Explain the Software Quality metrics for Object Oriented environment.	12M	4	1
	OR			
Q.4(B)	What is quality and metrics? Discuss in detail.	12M	4	1
Q.5(A)	Explain the different level of testing.	12M	5	2
	OR			
Q.5(B)	Explain the Black box testing techniques.	12M	5	2

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20MCAP105

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCAI Year I Semester (R20) Regular& Supplementary End Semester Examinations – May 2022

COMPUTER NETWORKS

Time: 3Hrs **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either A or B only

Q.No	Question	Marks	CO	BL
Q.1(A)	Explain the ISO/OSI reference model with a neat diagram.	12M	1	3
	OR			
Q.1(B)	List and explain the advantages and drawbacks of various types topology.	12M	1	3
Q.2(A)	A series of 8-bit message blocks 11100110 transmitted across a data link using a CRC for error detection. A generator polynomial of X4+ X3 +1 is to be used. Illustrate the following: (i) CRC Generation Process (ii) CRC Checking Process.	12M	2	4
	OR			
Q.2(B)	Mentioning the advantages and disadvantages, explain sliding window protocol using Go back n and using selective repeat.	12M	2	3
Q.3(A)	Compare and contrast the Circuit switching and Packet switching.	12M	3	4
	OR			
Q.3(B)	List and explain the goals and characteristics of routing algorithms.	12M	3	3
Q.4(A)	With the help of neat diagram, explain the Data flow and flow control feedbacks in TCP.	12M	4	4
	OR			
Q.4(B)	What are the services provided by the transport layer? Explain various the methods to improve QoS.	12M	4	4
Q.5(A)	Explain the Part of the DNS name space divided into zones.	12M	5	2
	OR			
Q.5(B)	Define Firewall. Explain the firewall and its types.	12M	5	4

***** END*****