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

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

MCA I Year I Semester (R22) Supplementary End Semester Examinations, August - 2023

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)	Obtain the Disjunctive Normal Form for the following: (a) $\neg(P \wedge Q) \leftrightarrow (P \vee Q)$	6M	1	1
	(b) $(P \rightarrow q) \wedge \neg q$	6M	1	1
	OR			
Q.1(B)	(a) Show that $S \vee R$ is tautologically implied by $(P \vee Q) \wedge (P \rightarrow R) \wedge (Q \rightarrow S)$.	6M	1	3
	(b) Show that $\neg(P \rightarrow Q)$ and $P \wedge \neg Q$ are logically equivalent.	6M	1	3
Q.2(A)	a) Check the given Relation R is Equivalence relation or not. X= {1,2,3,4,5,6} R = { (1,1) (1,3),(1,5),(3,5),(3.3), (5,5),(2,6),(2,2),(6.6),(6,2),(3.1),(5,1),(5,3)(4,4)}.	6M	2	3
	(b) How to Represent the relations explain with examples.	6M	2	2
	OR			
Q.2(B)	(a) Draw the Hasse diagram representing the partial ordering {(a,b) | a divides b} on {1,2,3,4,6,8,12}.	6M	2	1
	(b) Define the properties of a lattice.	6M	2	2
Q.3(A)	a) Define Euler graph and Hamiltonian graph with examples.	6M	3	3
	b) Complete graph is Hamiltonian? Justify.	6M	3	3
	OR			
Q.3(B)	a) What is Graph colouring? Explain with Examples.	6M	3	3
	b) Explain the Tree terminologies in Detail.	6M	3	3
Q.4(A)	Compute Bowley' coefficient of skewness for the following data:	12M	4	3

Class	10-19	20-29	30-39	40-49	50-59	60-69	70-79	80-89
f	5	9	14	20	25	15	8	1

OR

| Q.4(B) | Obtain the line of regression Y on X and estimate Y when $X = 45$ for the following data: | 12M | 4 | 3 |

X	56	42	72	36	63	47	55	49	38	68
Y	147	125	160	118	149	128	150	145	115	152

Q.5(A) (i) In studying the causes of power failures, these data have been gathered: 8M 5 2
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:
  (a) Line damage given that there is a transformer damage
  (b) Transformer damage given that there is line damage
  (c) Transformer damage but not line damage
  (d) Transformer damage given that there is no line damage.
  (e) Transformer damage or line damage.

(ii) Let X be a random variables with $E(X) = 3$, $E(X^2) = 25$, then find 4M 5 2
  (a) $E(5X+4)$ (b) $Var(X)$

OR

Q.5(B) (i) On a multiple-choice exam with three possible answers for each of the 6M 5 4
five questions, what is the probability that a student would get four or more correct answers just by guessing?

(ii) Define normal distribution and write its characteristics. 6M

*** END***

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MCAI Year I Semester (R22) Supplementary End Semester Examinations, August - 2023
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)	Explain about number system with IEEE 754 format. With example.	12M	1	3
	OR			
Q.1(B)	Explain Multiplexers and De-multiplexers	12M	1	2
Q.2(A)	Describe the instruction life cycle with neat diagram.	12M	2	2
	OR			
Q.2(B)	What is addressing mode? Explain different addressing modes with example.	12M	2	3
Q.3(A)	What is Hazard? Explain how the hazards are influence on instruction set	12M	3	2
	OR			
Q.3(B)	What is Pipelining? Explain the different hazards with suitable example.	12M	3	2
Q.4(A)	Explain the following a. Paging b. Swapping c. Demand paging.	12M	4	3
	OR			
Q.4(B)	Explain the memory hierarchy with neat diagram? With their advantages and disadvantages.	12M	4	2
Q.5(A)	Explain I/O organization with neat diagram.	12M	5	2
	OR			
Q.5(B)	Explain the following a. Interrupts b. DMA	12M	5	2

*** END***