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

Question Paper Code: 14MAT106

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA III Year II Semester (R14) Regular & Supplementary End Semester Examinations – May 2018

(Regulations: R14)

OPTIMIZATION TECHNIQUES

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 Part-A or B only

Q.1(A) The total profit y, in rupees, of a drug company from the manufacturing and sale of x drug bottles is given by, $y = -\left(\frac{x^2}{400}\right) + 2x - 80$ 12M

(i) How many drug bottles must the company sell in order to achieve the maximum profit?

(ii) What is the profit per drug bottle when this maximum is achieved?

OR

Q.1(B) Use the Kuhn-Tucker conditions to solve the following non-linear programming problem: 12M

$Max\ Z = 8x_1 + 10x_2 - x_1^2 - x_2^2$

$subject\ to\ 3x_1 + 2x_2 \le 6$

$and\ \ x_1, x_2 \ge 0$

Q.2(A) Solve following LP Problem using Simplex method. 12M

$Maximize\ Z = x_1 + x_2 + x_3$

Subject to

$4x_1 + 5x_2 + 3x_3 \le 15$

$10x_1 + 7x_2 + x_3 \le 12$

$and\ \ x_1, x_2, x_3 \ge 0$

OR

Q.2(B) Use two-phase simplex method to solve the following Linear Programming Problem. 12M

$Minimize\ Z = x_1 + x_2$

Subject to constraints

$2x_1 + x_2 \ge 4,$

$x_1 + 7x_2 \ge 7$

$and\ \ x_1, x_2 \ge 0$

Q.3(A) Consider four bases of operation B_i and three targets T_j. The tons of bombs per aircraft from any base that can be delivered to any target are given in the following table: 12M

Base (B_j) / Target (T_j)	T_1	T_2	T_3
B_1	8	6	5
B_2	6	6	6
B_3	10	8	4
B_4	8	6	4

The daily sortie capability of each of the four bases is 150 sorties per day. The daily requirement of sorties spread over each individual target is 200. Find the allocation of sorties from each base to each target which maximizes the total tonnage over all three targets.

OR

Q.3(B) A travelling salesman has to visit 5 cities. He wishes to start from a particular city, visit each city once and then return to his starting point. The travelling cost (in '000 Rs) of each city from a particular city is given below: 12M

From city / To city	A	B	C	D	E
A	-	2	5	7	1
B	6	-	3	8	2
C	8	7	-	4	7
D	12	4	6	-	5
E	1	3	2	8	-

What should be the sequence of visit of the salesman so that the cost is minimum?

Q.4(A) Use the graphical method for solving the following game and find the value of game. 12M

Player A / Player B	B_1	B_2	B_3	B_4
A_1	2	2	3	-2
A_2	4	3	2	6

OR

Q.4(B) Find the sequence that minimizes the total elapsed time required in performing the following jobs on three machines in the order ABC. Processing times (in hours) are given in the following table: 12M

Job	:	1	2	3	4	5	6
Machine A	:	8	3	7	2	5	1
Machine B	:	3	4	5	2	1	6
Machine C	:	8	7	6	9	10	9

Q.5(A) A small project involves 7 activities and their estimates are listed in the following table. 12M

Activity	Duration (Weeks)		
	Optimistic	Most likely	Pessimistic
1-2	1	1	7
1-3	1	4	7
1-4	2	2	8
2-5	1	1	1
3-5	2	5	14
4-6	2	5	8
5-6	3	6	15

(i) Draw the network of the activities

(ii) Find expected duration , variance for each activity and expected Project Length.

(iii) What is the probability that the project will be completed at least 4 weeks earlier than expected time.

OR

Q.5(B) A bakery keeps stock of a popular brand of cake. Previous experience shows the daily demand pattern for the item with associated probabilities, as given below: 12M

Daily demand (number)	0	10	20	30	40	50
Probability	0.01	0.2	0.15	0.5	0.12	0.02

Use the following sequence of random numbers to simulate the demand for next 10 days.

Random numbers: 25, 39, 65, 76, 12, 05, 73, 89, 19, 49.

Also estimate the daily average demand for the cakes on the basis of the simulated data.

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 14MCA115

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MCA III Year II Semester (R14) Regular & Supplementary End Semester Examinations – May 2018

(Regulations: R14)

SOFTWARE TESTING

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 Part-A or B only

Q.1(A) Explain about the following 12M

i. Path
ii. Path predicate expression
iii. Path predicate
iv. Compound predicate

OR

Q.1(B) i) What is path testing? Explain Path Testing criteria. 12M
ii) Write short notes on path sensitizing.

Q.2(A) i) Distinguish Control Flow and Transaction flow. 12M
ii) Discuss various flow graph elements with their notations.

OR

Q.2(B) Explain With a neat diagram, data flow anomaly flow graph. 12M

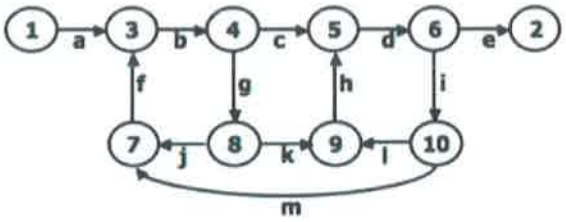
Q.3(A) Write short notes on the following 12M

i. Linear domain boundaries
ii. Non-linear domain boundaries
iii. Complete domain boundaries
iv. In complete domain boundaries

OR

Q.3(B) i) What are domain bugs? Discuss how to test them? 12M
ii) State and explain various two dimensional domain bugs with examples

Q.4(A) Explain the Reduction procedure algorithm for the following flow graph. 12M



OR

Q.4(B) Write short notes on the following 12M

i. Path products
ii. Path sums
iii. Path expression

Q.5(A) i) Explain with example the three variable KV chart. 12M
ii) Illustrate Decision table notation with an example.

OR

Q.5(B) i) Write short notes on logic based testing. 12M
ii) Explain State Graph.

***** END*****