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Question Paper Code: 14MCA31T19

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

MCA III Year I Semester (R14) Regular End Semester Examinations –Nov 2016

(Regulations: R14)

NETWORK PROGRAMMING

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) What are the different process identifiers? Explain the fork function. 12M

OR

Q.1(B) Explain the TCP/IP protocols. 12M

Q.2(A) What is socket? Explain the socket address structure. 12M

OR

Q.2(B) Explain concurrent server implementation with necessary coding. 12M

Q.3(A) Explain TCP echo server concepts with the help of a program. 12M

OR

Q.3(B) Describe the different I/O models in detail. 12M

Q.4(A) Explain generic socket options in detail. 12M

OR

Q.4(B) Write a C program to implement a UDP echo client and explain the steps involved. 12M

Q.5(A) Describe the features of Ipv4 and Ipv6 interoperability with its concepts. 12M

OR

Q.5(B) Write a traceroute program using C and explain the code. 12M

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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) Solve following non-linear programming problem using Lagrange multiplier method 12M

$$\text{Maximize } Z = 5x_1 + x_2 - (x_1 - x_2)^2,$$

$$\text{subject to } x_1 + x_2 = 4,$$

$$x_1, x_2 \geq 0$$

OR

Q.1(B) Use Kuhn-Tucker conditions to solve following problem. 12M

$$\text{Maximize } Z = 2x_1^2 - 7x_2^2 + 12x_1x_2,$$

$$2x_1 + 5x_2 \leq 98,$$

$$x_1, x_2 \geq 0.$$

Q.2(A) Solve following Linear Programming problem using Simplex method 12M

$$\text{Maximize } Z = 5X_1 + 3X_2$$

$$\text{Subject to } X_1 + X_2 \leq 2$$

$$5X_1 + 2X_2 \leq 10$$

$$3X_1 + 8X_2 \leq 12$$

$$\text{and } X_1, X_2 \geq 0$$

OR

Q.2(B) Use penalty (Big-M) method to solve following LP problem 12M

$$\text{Minimize } Z = 2X_1 + X_2$$

$$\text{Subject to } 3X_1 + X_2 = 3$$

$$4X_1 + 3X_2 \geq 6$$

$$X_1 + 2X_2 \leq 4$$

$$\text{and } X_1, X_2 \geq 0$$

Q.3(A) A steel company has three open hearth furnaces (F₁, F₂ and F₃) and five rolling mills 12M

(M₁, M₂, M₃, M₄ and M₅). The transportation costs (Rupees per quintal) for shipping steel from furnaces to rolling mills are given in the following table:

	M ₁	M ₂	M ₃	M ₄	M ₅	Supply
F ₁	4	2	3	2	6	8
F ₂	5	4	5	2	1	12
F ₃	6	5	4	7	7	14
Demand	4	4	6	8	8	

What is the optimal shipping schedule?

OR

- Q.3(B) Four software engineers are available to design four projects. Engineer E₂ is not competent to design Project P₂. Given the following time estimates needed by each engineer to design a given project. Find how the engineers should be assigned to project so as to minimize the total design time of four projects. 12M

Engineers	Projects			
	P ₁	P ₂	P ₃	P ₄
E ₁	12	10	10	8
E ₂	14	-	15	11
E ₃	6	10	16	4
E ₄	8	10	9	7

- Q.4(A) Use the dominance principle to reduce the following game to 2X2 game and hence solve it. Given matrix is pay-off matrix of player A. 12M

		Player B		
		I	II	III
Player A	I	8	5	8
	II	8	6	5
	III	7	4	5
	IV	6	5	6

OR

- Q.4(B) Find the sequence that minimizes the total time required in performing the following jobs on three machines in the order ABC. 12M

Job	1	2	3	4	5
Machine A	3	6	2	4	5
Machine B	7	9	13	8	11
Machine C	2	15	11	5	4

- Q.5(A) Draw the network for the following activity data. Find the critical path and the three floats for each activity. 12M

Activity	1-2	1-4	2-3	3-5	3-8	4-8	5-6	5-8	6-7	7-8	7-9	8-9	9-10
Duration (Days)	4	36	2	15	10	2	4	9	9	9	8	20	20

OR

- Q.5(B) What is the significance of Simulation? Discuss about application of simulation. 12M

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Question Paper Code: 14MCA31T17

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BIG DATA AND ANALYTICS

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) Discuss Big data in terms of three dimensions, volume, variety and velocity 12M

OR

Q.1(B) Explain briefly Modern Data Analytic tools. 12M

Q.2(A) Describe the Big Data Stream Analytics Framework (BDSAF) with a neat architecture diagram. 12M

OR

Q.2(B) List the main characteristics of stream sources and Explain how is data analysis used in stock market predictions? 12M

Q.3(A) Explain Map reduce job scheduling in detail with neat diagram. 12M

OR

Q.3(B) Explain in detail about the design of Hadoop distributed file system and concept in detail. 12M

Q.4(A) What is the need of NoSQL databases? Explain in detail about its working mechanisms in data bases. 12M

OR

Q.4(B) Define Hadoop. Give detail information on how will set up Hadoop cluster. 12M

Q.5(A) Explain Pig data Model in detail and Discuss how it will help for effective data flow. 12M

OR

Q.5(B) What are the different ways to insert data into a table using Hive? Give a sample query for each kind with explanation. 12M

***** END*****