Time: 2 hour 30 minutes **Max. Marks: 80**

Instructions:

i. Question 1 is compulsory.

ii. Solve any three from remaining.

Q1. Each question carries 5 Marks.

A Solve the following LPP using graphical method

Maximize $Z = 2x1 + 5x2$

subject to the conditions $x1 + 4x2 \leq 24$

$3x1 + x2 \leq 21$

$x1 + x2 \leq 9$ and $x1, x2 \geq 0$

B Given three sources O1, O2 and O3 and four Destinations D1, D2, D3 and D4. For the sources O1, O2 and O3, the supply is 300, 400 and 500 respectively. The destinations D1, D2, D3 and D4 have demands 250, 350, 400 and 200 respectively. Find basic feasible solution using north west corner method

C Explain different steps of Simulation with diagram.

D Arrivals at a telephone both are considered to be Poisson at an average time of 8 min between our arrival and the next. The length of the phone call is distributed exponentially, with a mean of 4 min.

Determine

i. Expected number of units in the system

ii. Expected waiting time in the system

Q2. Each question carries 10 Marks.

A Use the simplex method to find the optimal solutions of the following LP Problem.

Max. $Z = 7x1 + 5x2$

subject to

$x1 + 2x2 \leq 6$

$4x1 + 3x2 \leq 12$

$x1, x2 \geq 0$

B

Solve the following game by using the principle of dominance.

	B1	B2	B3	B4	B5	B6
A1	4	2	0	2	1	1
A2	4	3	1	3	2	2
A3	4	3	7	-5	1	2
A4	4	3	4	-1	2	2
A5	4	3	3	-2	2	2

Q3. Each question carries 10 Marks.

A

Solve the assignment problem At the head office of a company there are five registration counters. Five persons are available for service. How should the counters be assigned to persons so as to maximize the profit?

C/P	A	B	C	D	E
1	30	37	40	28	40
2	40	24	27	21	36
3	40	32	33	30	35
4	25	38	40	36	36
5	29	62	41	34	39

B

Solve using simplex metho

Minimize $Z=4x+2y$

Subject to

$5x+y \geq 5$

$x+3y \geq 10$

$x \geq 0, y \geq 0$

Q4. Each question carries 10 Marks.

A

Solve using two phase simplex method

Maximize $Z = 4x + 5y$

Subject to $2x + 3y \leq 6$

$3x + y \geq 3$

$x, y \geq 0$

B Three jobs A ,B, C are to be assigned to three machines X, Y, Z. The processing costs are as given in the matrix shown below. Find the allocation which will minimize the overall processing cost.

		Machines		
		X	Y	Z
Jobs	A	19	28	31
	B	11	17	16
	C	12	15	13

Q5. Each question carries 10 Marks.

Consider a box office ticket window being manned by a single server. Customer arrives to purchase ticket according to Poisson input process with a mean rate of 30/hr. the time required to serve a customer has an ED with a mean of 90 seconds determine:.

A (a) Mean queue length.
(b) Mean waiting time in the system.
(c) The probability of the customer waiting in the queue for more than 10min.
(d) The fraction of the time for which the server is busy.

B What is a random number? What are the problems associated with generating pseudo random numbers.

Q6. Each question carries 10 Marks.

Solve using Big M-method

Maximize $z = x1 + 5x2$

subject to

A $3x1 + 4x2 \leq 6$
$x1 + 3x2 \geq 2$

$x1, x2 \geq 0$

B Find the optimal solution of given transportation problem using MODI method

		Destination				
		D1	D2	D3	D4	Supply
Source	O1	3	1	7	4	250
	O2	2	6	5	9	350
	O3	8	3	3	2	400
	Demand	200	300	350	150	

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NAME :

Paper / Subject Code: 70652 / Artificial Intelligence & Machin Learning

MCA | sem - II | (R-2020) | Feb-2023 | SH-2022

Time: 3 Hours

Max. Marks: 80

80 Marks

N.B.: (1) Q. 1 is compulsory.
(2) Attempt any three out of the remaining five.
(3) Figures to the right indicate full marks.

Q.1	A	Bias/Variance tradeoff	5
	B	Intelligent Agent	5
	C	Principal Component Analysis	5
	D	Activation Function	5
Q.2	A	Explain Expectation-Maximization algorithm with an example.	10
	B	Discuss Dimensionality Reduction in detail.	10
Q.3	A	Explain K-nearest neighbor algorithm with example.	10
	B	Explain Support Vector Machine in detail.	10
Q.4	A	Discuss Perceptron algorithm with a neat flowchart.	10
	B	Explain First order logic with example.	10
Q.5	A	Explain A* Algorithm with a suitable example.	10
	B	Explain Adaline neural network with an example.	10
Q.6	A	Discuss Alpha Beta search algorithm with a suitable example.	10
	B	Explain Random forest algorithm in detail.	10

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Q.P. code.
19408

Paper / Subject Code: 70653 / Information Security

MCA / Sem-II / (C-2021) / Feb. 2023 / SH-2022

[Time: 3 Hours] [Marks:80]

Please check whether you have got the right question paper.

N.B:
1. **Question No.1 is compulsory.**
2. **Attempt any THREE from the remaining questions.**
3. **Figures to the right indicate full marks.**

1. a) Explain Information Security principles. **5**

   b) Explain Kerberos. **5**

   c) Describe working of S/MIME. **5**

   d) Explain DOS attack. **5**

2. a) What is SSL? Explain three major protocols use at SSL. **10**

   b) What is Message Digest? Explain MD5 in detail. **10**

3. a) Discuss Inference. What are the various approaches to deal with it? **10**

   b) What is Firewall? Discuss its types in detail. **10**

4. a) What is IDS? Explain Statistical Anomaly Detection and Rule based Detection. **10**

   b) What is PKI? How does PKI work? **10**

5. a) Explain Euclidean algorithm. Using Euclidean algorithm, find the greatest common divisor of the following: **10**
   i) 285 and 741 ii) 88 and 220

   b) Explain RSA algorithm with example. **10**

6. a) Explain Digital Encryption Standard (DES) in detail. **10**

   b) What is MAC? Explain HMAC in detail. **10**

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G.P.code.

17122

MCA / SEM-II / C-2020 / MAR. 2023 / SH-2022

Time: 3 Hours **Total Marks: 80**

N.B.
1) Question No.1 is compulsory.
2) Attempt any three from the remaining five questions.
3) Figures to the right indicate full marks

Q.1	**(a)**	Define IoT and Describe any four characteristics of IoT.	**05**
	(b)	Explain IoT reference model with the help of diagram.	**05**
	(c)	Write a note on Modbus protocol.	**05**
	(d)	Distinguish between Web of Things and Internet of Things.	**05**
Q.2	**(a)**	Explain IoT reference architecture. What are different views used for presentation of IoT reference architecture. Explain any one of them.	**10**
	(b)	Explain the various steps involved in IOT system design methodology?	**10**
Q. 3	**(a)**	Explain Cloud Computing and WSN as IoT enabling technologies.	**10**
	(b)	Elaborate the application of IOT in the following domains: Cities and Environment.	**10**
Q. 4	**(a)**	Why there is need for IoT Security. Explain elements of IoT Security.	**10**
	(b)	Explain the Cloud of things architecture with suitable diagram.	**10**
Q. 5	**(a)**	Explain European Telecommunications Standards Institute(ETSI) M2M model in detail.	**10**
	(b)	What are the different efforts that have been taken for IOT Protocol Standardization?	**10**
Q. 6	**(a)**	Explain various IoT Communication Models.	**10**
	(b)	Use IoT design methodology steps and design Home automation system.	**10**

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Q.P. CODE
18204

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NAME :

MCA / SEM-II / C-2020 / MAR. 2023 / SH-2022

(3 Hours) Max. Marks: 80

1. Question No: 01 is compulsory
2. Attempt any three from Q2 to Q6

Q1 Solve

A Analyze and solve the recurrence relation for merge sort. 05

B Explain Branch and Bound with an example. 05

C Write Boyer Moore algorithm for String Matching. 05

D How greedy technique is used to Minimum cost spanning tree. Explain 05

Q2 Solve

A What do you mean by Dynamic Programming, write an algorithm to solve Longest common subsequence by using Dynamic Programming approach? 10

B Explain Binary search using divide and conquer Methodology. 10

Q3 Solve

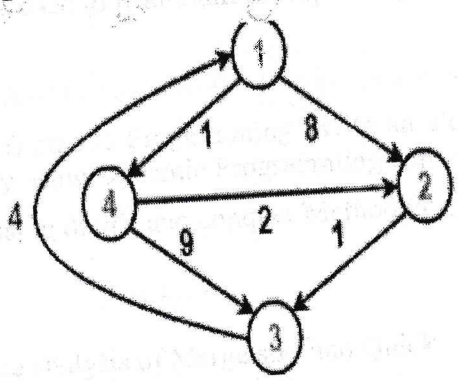
A Write detail Comparative analysis of Merge sort and Quick Sort techniques on the basis of following points: 10

- Working
- Space and time complexity
- Efficiency

B Solve Graph colouring problem using Backtracking technique. 10

Q4. Solve

A Using Floyd Warshall Algorithm, find the shortest path distance between every pair of vertices. 10



B Define NP Hard and NP –complete problem. 10

Q.P.CODE 16964

NAME :

Q5. Solve

A Solve Convex- Hull Problems using quick hull algorithm and Jarvis march algorithm using Divide And Conquer approach. **10**

B Write short note on LIFO Search, FIFO search and Least cost search using Branch and Bound. **10**

Q6. Solve

A Find the LC branch and bound solution for the travelling sales person problem whose cost matrix is as follows. **10**

The cost matrix is

$$\begin{pmatrix} \infty & 20 & 30 & 10 & 11 \\ 15 & \infty & 16 & 4 & 2 \\ 3 & 5 & \infty & 2 & 4 \\ 19 & 6 & 18 & \infty & 3 \\ 16 & 4 & 7 & 16 & \infty \end{pmatrix}$$

B Write Rabin-Karp algorithm for string matching, also explain it with an example. **10**

MCA / SEM-II / C-2020 / MAR. 2023 / SH - 2022

Paper / Subject Code: 70662 / Elective II : Digital Marketing & Business Analysis

(Time : 3 Hours) **[Total Marks : 80]**

N.B. : 1) Question No.1 is **compulsory.**
2) From Q.2 to Q.6 attempt any **THREE from** the remaining **Five** questions.
3) Figures to the right indicate full marks

Q.1	**(a)**	Explain the concept of Linked In analytics.	**5**
	(b)	What do you mean by Ad Impressions, Clicks and CTR? Explain.	**5**
	(c)	Explain the concept of multi-channel attribution.	**5**
	(d)	Why is social media so important in search engine optimization?	**5**
Q.2	**(a)**	What is digital marketing? Explain the concept of digital marketing strategy.	**10**
	(b)	Explain the steps involved in mobile app marketing.	**10**
Q.3	**(a)**	Why it is important to have LinkedIn presence? What content strategy works for LinkedIn?	**10**
	(b)	How do you build a successful social media strategy?	**10**
Q.4	**(a)**	Explain on-page and off-page optimization in detail.	**10**
	(b)	Discuss the different types of tracking codes.	**10**
Q.5	**(a)**	Explain the concept of Ad placement and Ad Ranks in search engine advertising	**10**
	(b)	Discuss different Twitter tools that can enhance its effectiveness.	**10**
Q.6	**(a)**	Explain the various text-based and voice-based tools available in mobile marketing.	**10**
	(b)	Explain the key metrics associated with web analytics.	**10**

Q. P. CODE
17538

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NAME :