University of Mumbai
Online Examination 2020

Program: BE Engineering
Curriculum Scheme: R-2016
Examination: Final Year Semester VII
Course Code: ILOC 7015 Course Name: Operations Research
Time: 1 hour Max. Marks: 50

Question Paper Set No._04

Note: Each question is for 2 marks.

		Multiple Choice Questions (MCQ)
		ALL questions are compulsory. There are 25 questions, each question carries 2 mark.
1.	The unit of traffic intensity is:	
	a)	Poisson
	b)	Markow
	c)	Erlang
	d)	Kendall
2.	Arrival rate of telephone calls at a telephone booth is according to Poisson distribution, with an average time of 9 minutes between consecutive arrivals. The length of telephone call is exponentially distributed with a man of 3 minutes. Find the average queue length that forms from time to time	
	a)	1.5 persons
	b)	1 person
	c)	2.5 persons
	d)	12.5 persons
3.	In a departmental store one cashier is there to serve the customers and the customers pick up their needs by themselves. The arrival rate is 9 customers for every 5 minutes and the cashier can serve 10 customers in 5 minutes. Assuming Poisson arrival rate and exponential distribution for service rate. Find average number of customers in the system.	
	a)	0.11 customers
	b)	9 customers
	c)	11 customers
	d)	0.9 customers
4.	Determine the idle time of the service facility	
	a)	1 min
	b)	2 min
	c)	3 min
	d)	0 min
5.	Read the given question answer the following questions 11,12 A company manufactures around 200 bikes. Depending upon the availability of raw material and other conditions, the daily production has been varying from 196 to 204 bikes. The finished bikes are transported in a specially designed three- storied lorry that can accommodate only 200 bikes , whose probability distribution and random numbers are given in the following table:	

Day	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Random No.	82	89	78	24	53	61	18	45	04	23	50	77	27	54	10
Production/day	202	203	202	198	200	201	19	200	196	198	200	202	199	200	197

Simulate the process to find out what will be the average number of bikes waiting in the factory

a) 1
b) 2
c) 3
d) 4

6. What will be the average number of empty space in the lorry

a) 0
b) 1
c) 2
d) 3

7. If a problem can be broken into sub-problem which are reused several times, the problem possesses ……………property.

a) Overlapping sub-problem
b) Optimal substructure
c) Memoization
d) Greedy

8. Find a recurrence relation and initial conditions for 1, 5, 17, 53, 161, 485…

a) $a_n=3a_{n-1} + 2$ and $a_0 = 0$
b) $a_n=3a_{n-1} - 2$ and $a_0 = 0$
c) $a_n=3a_{n-1} + 2$ and $a_0 = 1$
d) $a_n=3a_{n-1} - 2$ and $a_0 = 1$

9. For which of the following problems is most suitable for Probabilistic Dynamic problem solving method?

a) Distributing medical teams to countries
b) Scheduling employment levels
c) Winning in Las Vegas
d) Stagecoach problem

10. If a two person zero sum game is converted to a Linear Programming Problem,

a) Number of variables must be two only
b) There will be no objective function
c) Row player represents Primal problem, Column player represent Dual problem
d) Number of constraints is two only

11. One of the assumption in the game theory is—

a) All players act rationally and intelligently

	b)	Winner alone acts rationally
	c)	Loser acts intelligently
	d)	Both the players believe luck
12.	In a two person zero sum game, the following does not hold correct:	
	a)	Row player is always a loser
	b)	Column Player is always a winner.
	c)	Column player always minimizes losses
	d)	If one loses, the other gains.
13.	The EOQ for the following data Annual usage = 1000 pieces Expending cost = Rs. 4 per order Cost per piece = Rs. 250 Inventory holding cost= 20% of average inventory Ordering cost = Rs. 6 per order Material holding cost= Re.1 per piece	
	a)	22
	b)	23
	c)	20
	d)	24
14.	A contractor has to supply 10,000 bearings per day to an automobile manufacturer. He finds that, when he starts production run, he can produce 25,000 bearing per day. The cost of holding a bearing in stock for a year is Rs. 2 and set up cost of a production run is Rs. 1800. How frequently should production run be made	
	a)	10.44 days
	b)	11.44 days
	c)	12 days
	d)	11 days
15.	Re-order level of an item is always	
	a)	Less than its minimum stock
	b)	Less than its maximum stock
	c)	More than its maximum stock
	d)	More than its minimum stock
16.	In the Simplex method to convert a constraint of type ≤, to equation form, we need to add what type of variable?	
	a)	surplus variable
	b)	slack variable
	c)	artificial variable
	d)	dual variable
17.	Consider the constraints for a LPP 3a + 5b =15 and 5a + 2b = 10. Given a, b ≥ 0. The number of vertex points in the feasibility convex region are?	
	a)	1
	b)	2
	c)	3
	d)	4
18.	Consider the constraints for a LPP 7a + 3b ≤ 24, a + 2b ≤ 6 and b ≤ 6. Given a, b ≥ 0. The number of vertex points in the feasibility convex region are?	
	a)	4

	b)	6
	c)	8
	d)	10
19.	Consider the constraints for a LPP $7a + 3b \leq 24$ and $b \leq 2$. Given $a, b \geq 0$. The number of vertex points in the feasibility convex region are?	
	a)	2
	b)	4
	c)	6
	d)	No Feasible region
20.	Four people A, B, C and D are standing on one bank of a river and wish to cross to the opposite bank using a canoe. The canoe can hold maximum 2 people at a time. A can row across in 2 min, B takes 4 min, C takes 7 min and D takes 12 min. If two people are in the canoe, the slower person dictates the crossing time. What is the smallest time to move all 4 people to the other side of the river?	
	a)	28 min
	b)	27 min
	c)	25 min
	d)	26 min
21.	Three people A, B, and C are standing on one bank of a river and wish to cross to the opposite bank using a canoe. The canoe can hold maximum 2 people at a time. A can row across in 1min, B takes 6min and C takes 12min. If two people are in the canoe, the slower person dictates the crossing time. What is the smallest time to move all 3 people to the other side of the river?	
	a)	19 min
	b)	12 min
	c)	18 min
	d)	13 min
22.	A company produces two products: Product A and Product B. Each product must go through two processes: assembly and painting. The times required (in minutes) for each product in each process as well as the per unit profit for each product are shown below:	

	Product	
	A	B
Revenue	$ 27.00	$ 30.00
Unit Assembly Time (minutes)	3	4.5
Unit Painting Time (minutes)	6	3

The company has 60 hours of assembly time and 80 hours of painting time available each week. If a linear programming model is used to determine the optimal number of Products A and B to produce next week, the optimal number of Product B's to produce next week would be

	a)	400
	b)	300
	c)	176
	d)	6.67
23.	Linear relationships representing a restriction on decision making in a linear	

	programming model are known as	
	a)	objective function
	b)	constraints
	c)	extreme points
	d)	slack variables
24.	Having more than one shipping distribution but with the same total cost is known as:	
	a)	a prohibited solution
	b)	an unequal solution
	c)	an alternative optimal solution
	d)	a transshipment solution
25.	In linear programming extreme points are:	
	a)	variables representing unused resources
	b)	variables representing an excess above a resource requirement
	c)	all the points that simultaneously satisfy all the constraints of the model
	d)	corner points on the boundary of the feasible solution space

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Answer Keys to Question Paper Set no. 04

Enter a, b, c, or d in the correct option column

Question	Correct Option	Question	Correct Option
Q.1	c	Q.14	a
Q.2	a	Q.15	c
Q.3	b	Q.16	b
Q.4	d	Q.17	a
Q.5	c	Q.18	a
Q.6	a	Q.19	b
Q.7	a	Q.20	d
Q.8	c	Q.21	a
Q.9	c	Q.22	d
Q.10	c	Q.23	b
Q.11	a	Q.24	c
Q.12	a	Q.25	d
Q.13	c	---	---