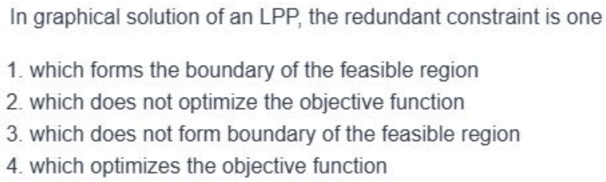
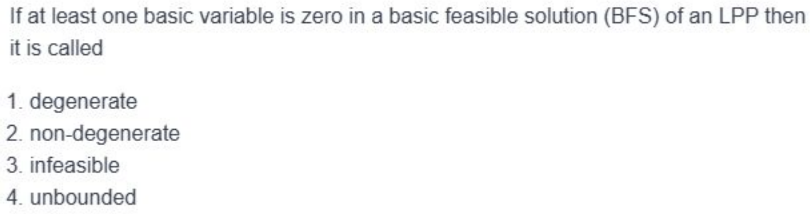
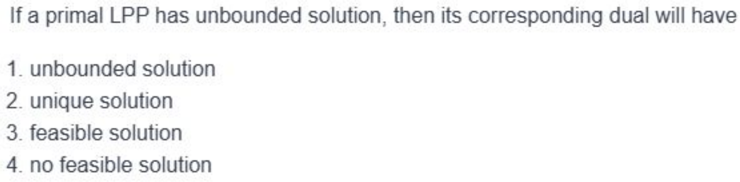
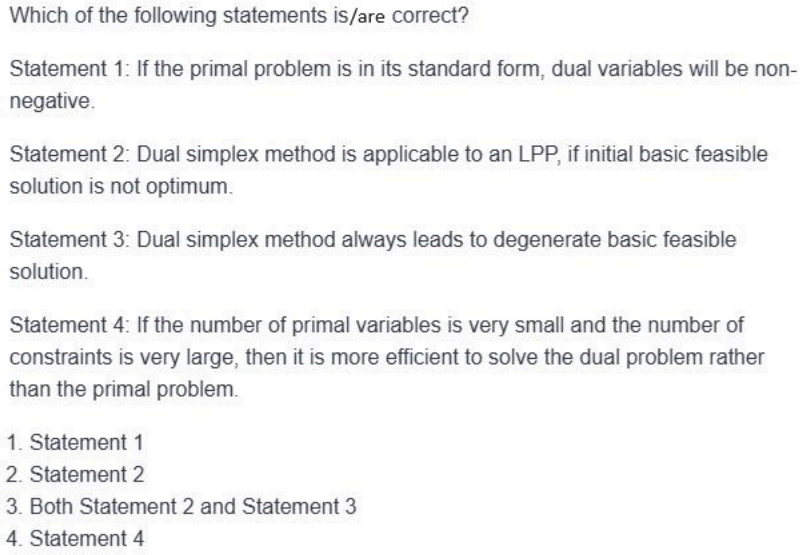
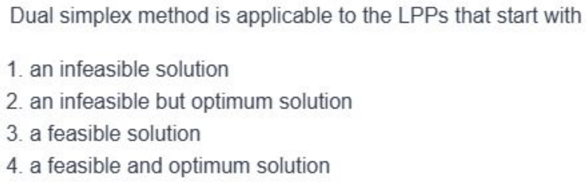
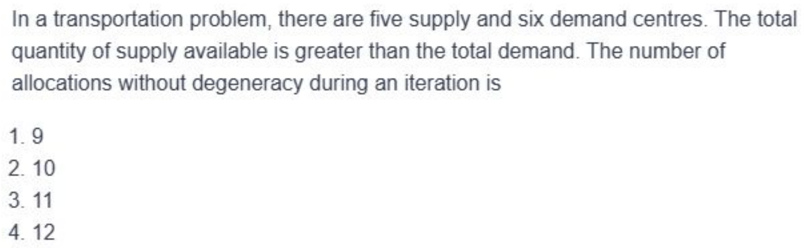
PREVIEW QUESTION BANK

Module Name : cec24-ma05 Operations Research-ENG
Exam Date : 18-May-2024 Batch : 09:00-12:00

Sr. No.	Client Question ID	Question Body and Alternatives	Marks	Negative Marks
Objective Question				
1	11071001	 In graphical solution of an LPP, the redundant constraint is one 1. which forms the boundary of the feasible region 2. which does not optimize the objective function 3. which does not form boundary of the feasible region 4. which optimizes the objective function A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
2	11071002	 If at least one basic variable is zero in a basic feasible solution (BFS) of an LPP then it is called 1. degenerate 2. non-degenerate 3. infeasible 4. unbounded A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
3	11071003	 If a primal LPP has unbounded solution, then its corresponding dual will have 1. unbounded solution 2. unique solution 3. feasible solution 4. no feasible solution A1 : 1	2.0	0.00

		A2 : 2 A3 : 3 A4 : 4		
Objective Question				
4	11071004	Which of the following statements is/are correct? Statement 1: If the primal problem is in its standard form, dual variables will be non-negative. Statement 2: Dual simplex method is applicable to an LPP, if initial basic feasible solution is not optimum. Statement 3: Dual simplex method always leads to degenerate basic feasible solution. Statement 4: If the number of primal variables is very small and the number of constraints is very large, then it is more efficient to solve the dual problem rather than the primal problem. 1. Statement 1 2. Statement 2 3. Both Statement 2 and Statement 3 4. Statement 4 A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
5	11071005	Dual simplex method is applicable to the LPPs that start with 1. an infeasible solution 2. an infeasible but optimum solution 3. a feasible solution 4. a feasible and optimum solution A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
6	11071006		2.0	0.00



In a transportation problem, there are five supply and six demand centres. The total quantity of supply available is greater than the total demand. The number of allocations without degeneracy during an iteration is

1. 9
2. 10
3. 11
4. 12

A1 : 1

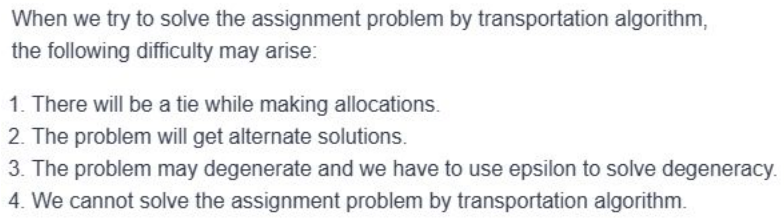
A2 : 2

A3 : 3

A4 : 4

Objective Question

7 11071007 2.0 0.00



When we try to solve the assignment problem by transportation algorithm, the following difficulty may arise:

1. There will be a tie while making allocations.
2. The problem will get alternate solutions.
3. The problem may degenerate and we have to use epsilon to solve degeneracy.
4. We cannot solve the assignment problem by transportation algorithm.

A1 : 1

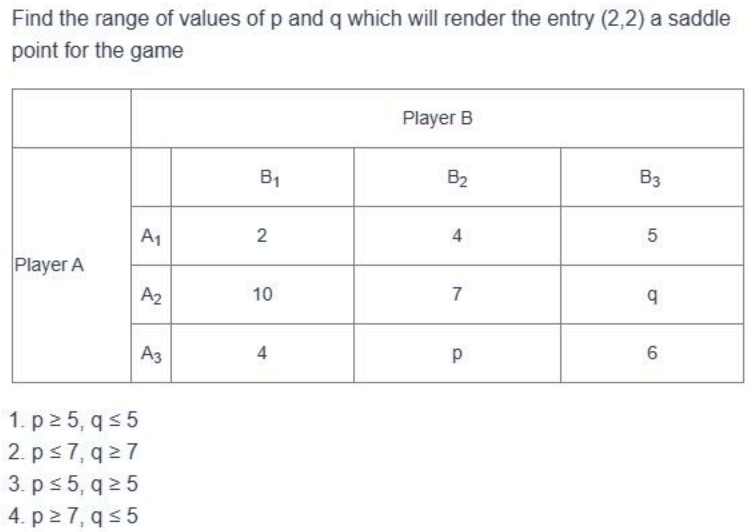
A2 : 2

A3 : 3

A4 : 4

Objective Question

8 11071008 2.0 0.00



Find the range of values of p and q which will render the entry (2,2) a saddle point for the game

	Player B			
		B_1	B_2	B_3
Player A	A_1	2	4	5
	A_2	10	7	q
	A_3	4	p	6

1. p ≥ 5, q ≤ 5
2. p ≤ 7, q ≥ 7
3. p ≤ 5, q ≥ 5
4. p ≥ 7, q ≤ 5

A1 : 1

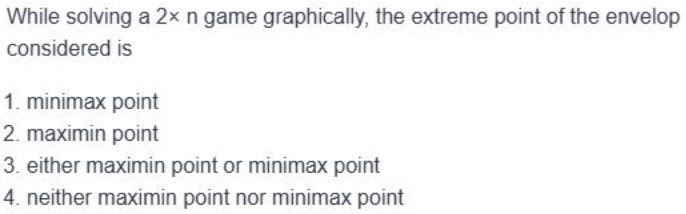
A2 : 2

A3 : 3

A4 : 4

Objective Question

9 11071009 2.0 0.00



While solving a 2× n game graphically, the extreme point of the envelop considered is

1. minimax point
2. maximin point
3. either maximin point or minimax point
4. neither maximin point nor minimax point

A1 : 1

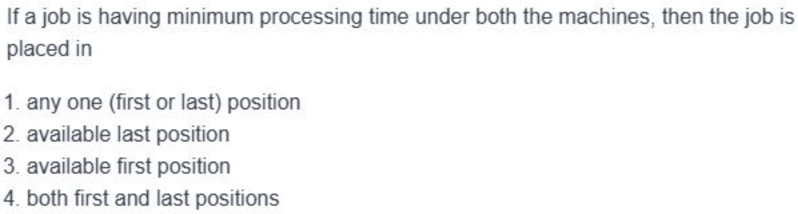
A2 : 2

A3 : 3

A4 : 4

Objective Question

10 11071010 2.0 0.00



If a job is having minimum processing time under both the machines, then the job is placed in

1. any one (first or last) position
2. available last position
3. available first position
4. both first and last positions

A1 : 1

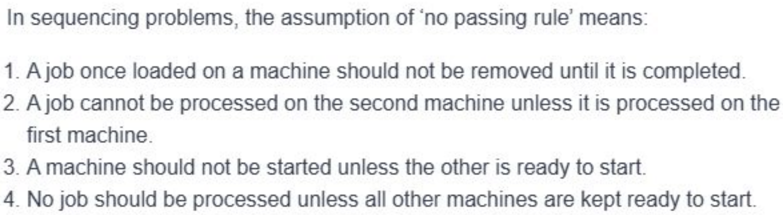
A2 : 2

A3 : 3

A4 : 4

Objective Question

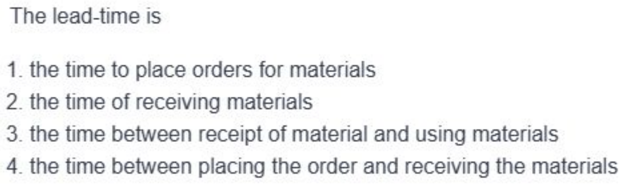
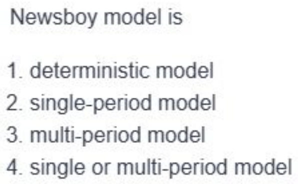
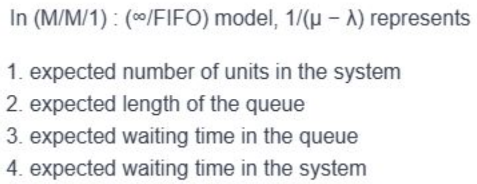
11 11071011 2.0 0.00

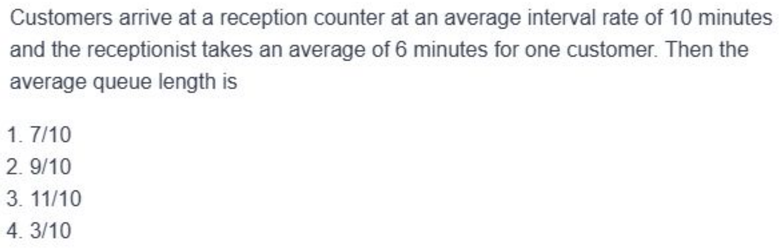
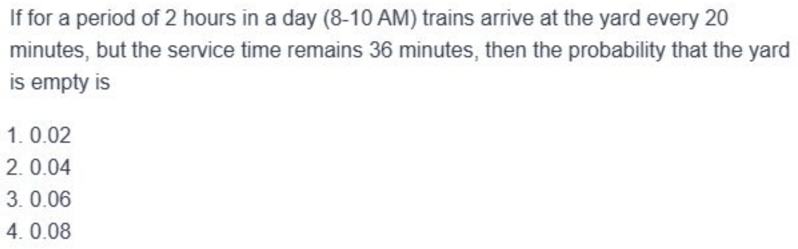
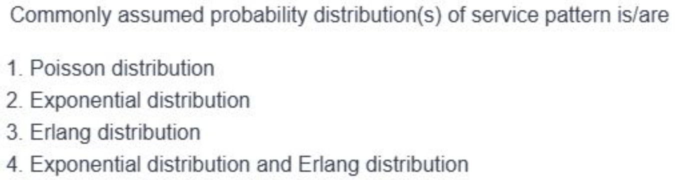


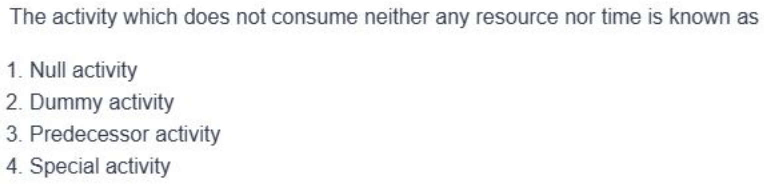
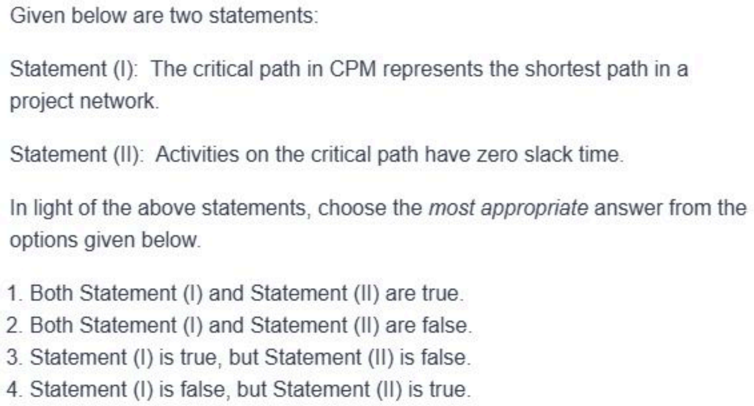
In sequencing problems, the assumption of ‘no passing rule’ means:

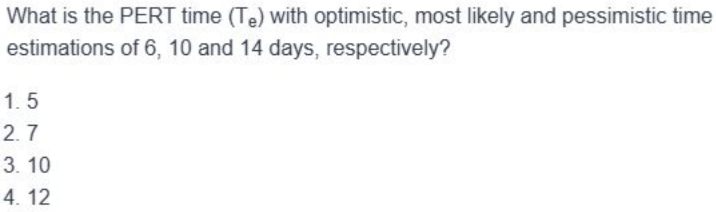
1. A job once loaded on a machine should not be removed until it is completed.
2. A job cannot be processed on the second machine unless it is processed on the first machine.
3. A machine should not be started unless the other is ready to start.
4. No job should be processed unless all other machines are kept ready to start.

		A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
12	11071012	In retrogressive failures, the failure probability ——with time. 1. increases 2. decreases 3. may increase or decrease 4. remains constant A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
13	11071013	When money value changes with time at 20%, the discount factor for second year is 1. 1 2. 0 3. 0.833 4. 0.6955 A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
14	11071014	Economic Order Quantity is given by: (where, c_1 = inventory carrying cost, c_3 = ordering cost, R = demand rate for the product) 1. $(2c_1/c_3)^{1/2}$ 2. $(2c_3/(c_1R))^{1/2}$ 3. $2c_3R/c_1$ 4. $(2c_3R/c_1)^{1/2}$	2.0	0.00

		A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
15	11071015	 The lead-time is 1. the time to place orders for materials 2. the time of receiving materials 3. the time between receipt of material and using materials 4. the time between placing the order and receiving the materials A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
16	11071016	 Newsboy model is 1. deterministic model 2. single-period model 3. multi-period model 4. single or multi-period model A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
17	11071017	 In (M/M/1) : (∞/FIFO) model, $1/(\mu - \lambda)$ represents 1. expected number of units in the system 2. expected length of the queue 3. expected waiting time in the queue 4. expected waiting time in the system A1 : 1	2.0	0.00

		A2 : 2 A3 : 3 A4 : 4		
Objective Question				
18	11071018	 Customers arrive at a reception counter at an average interval rate of 10 minutes and the receptionist takes an average of 6 minutes for one customer. Then the average queue length is 1. 7/10 2. 9/10 3. 11/10 4. 3/10 A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
19	11071019	 If for a period of 2 hours in a day (8-10 AM) trains arrive at the yard every 20 minutes, but the service time remains 36 minutes, then the probability that the yard is empty is 1. 0.02 2. 0.04 3. 0.06 4. 0.08 A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
20	11071020	 Commonly assumed probability distribution(s) of service pattern is/are 1. Poisson distribution 2. Exponential distribution 3. Erlang distribution 4. Exponential distribution and Erlang distribution	2.0	0.00

		A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
21	11071021	 The activity which does not consume neither any resource nor time is known as 1. Null activity 2. Dummy activity 3. Predecessor activity 4. Special activity A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
22	11071022	 Given below are two statements: Statement (I): The critical path in CPM represents the shortest path in a project network. Statement (II): Activities on the critical path have zero slack time. In light of the above statements, choose the *most appropriate* answer from the options given below. 1. Both Statement (I) and Statement (II) are true. 2. Both Statement (I) and Statement (II) are false. 3. Statement (I) is true, but Statement (II) is false. 4. Statement (I) is false, but Statement (II) is true. A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
23	11071023		2.0	0.00



What is the PERT time (T_e) with optimistic, most likely and pessimistic time estimations of 6, 10 and 14 days, respectively?

1. 5
2. 7
3. 10
4. 12

A1 : 1

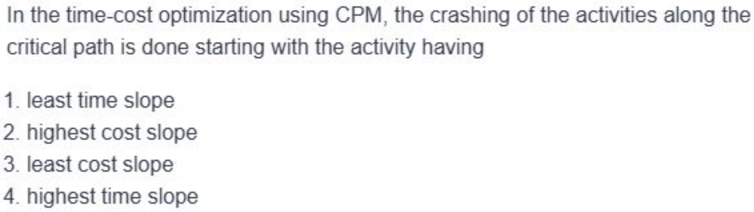
A2 : 2

A3 : 3

A4 : 4

Objective Question

24 11071024 2.0 0.00



In the time-cost optimization using CPM, the crashing of the activities along the critical path is done starting with the activity having

1. least time slope
2. highest cost slope
3. least cost slope
4. highest time slope

A1 : 1

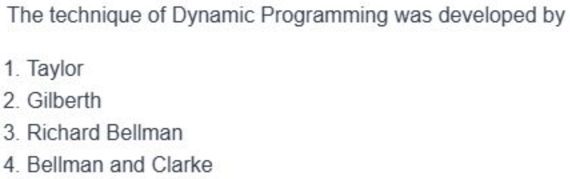
A2 : 2

A3 : 3

A4 : 4

Objective Question

25 11071025 2.0 0.00



The technique of Dynamic Programming was developed by

1. Taylor
2. Gilberth
3. Richard Bellman
4. Bellman and Clarke

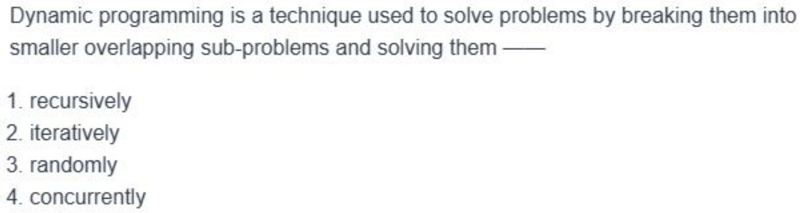
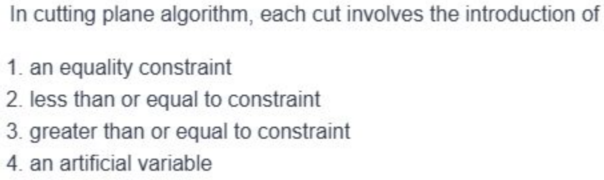
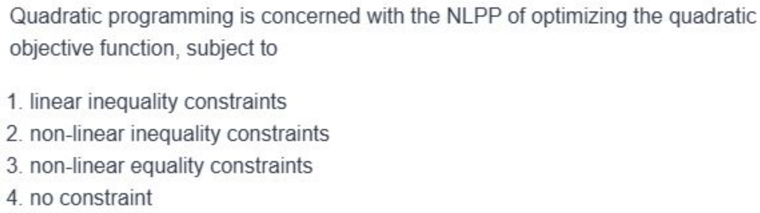
A1 : 1

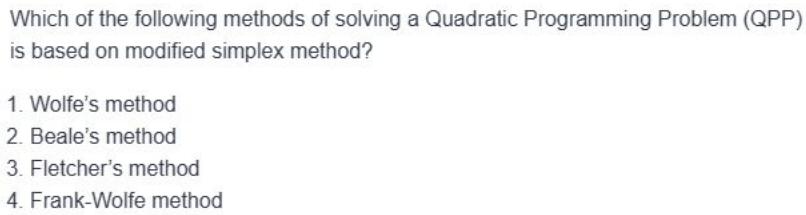
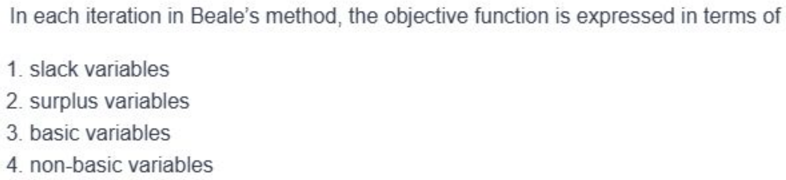
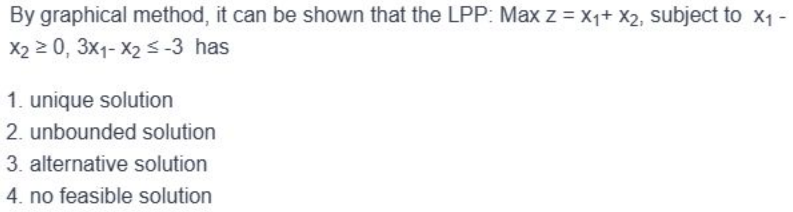
A2 : 2

A3 : 3

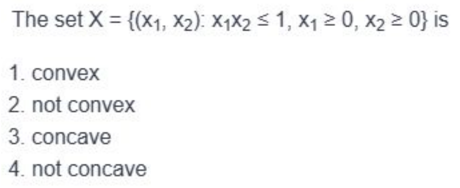
A4 : 4

Objective Question

26	11071026	 Dynamic programming is a technique used to solve problems by breaking them into smaller overlapping sub-problems and solving them —— 1. recursively 2. iteratively 3. randomly 4. concurrently A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
27	11071027	 In cutting plane algorithm, each cut involves the introduction of 1. an equality constraint 2. less than or equal to constraint 3. greater than or equal to constraint 4. an artificial variable A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
28	11071028	 Quadratic programming is concerned with the NLPP of optimizing the quadratic objective function, subject to 1. linear inequality constraints 2. non-linear inequality constraints 3. non-linear equality constraints 4. no constraint A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
29	11071029		2.0	0.00

		 Which of the following methods of solving a Quadratic Programming Problem (QPP) is based on modified simplex method? 1. Wolfe's method 2. Beale's method 3. Fletcher's method 4. Frank-Wolfe method A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
30	11071030	 In each iteration in Beale's method, the objective function is expressed in terms of 1. slack variables 2. surplus variables 3. basic variables 4. non-basic variables A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
31	11071031	 By graphical method, it can be shown that the LPP: Max $z = x_1 + x_2$, subject to $x_1 - x_2 \geq 0$, $3x_1 - x_2 \leq -3$ has 1. unique solution 2. unbounded solution 3. alternative solution 4. no feasible solution A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				

32 11071032 2.0 0.00



The set X = {(x_1, x_2): $x_1x_2 \le 1$, $x_1 \ge 0$, $x_2 \ge 0$} is

1. convex
2. not convex
3. concave
4. not concave

A1 : 1

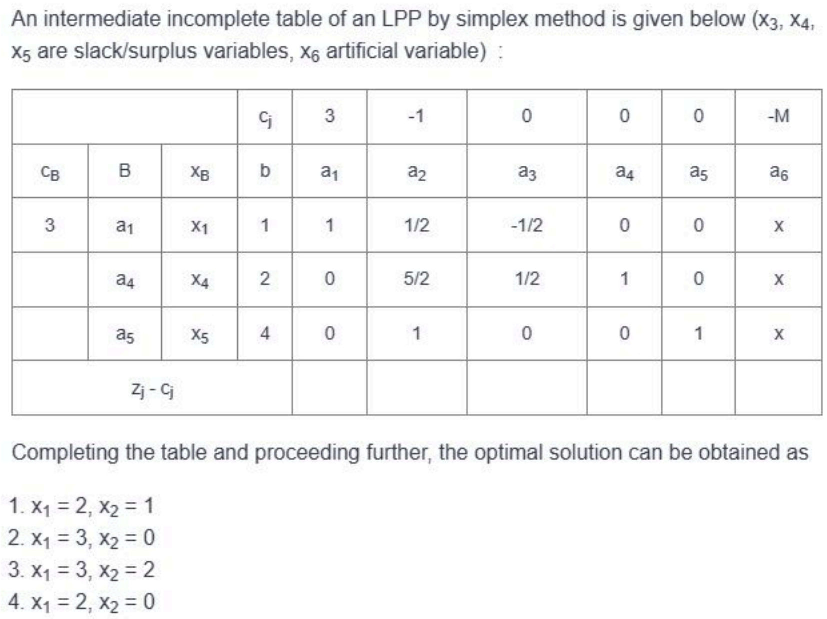
A2 : 2

A3 : 3

A4 : 4

Objective Question

33 11071033 2.0 0.00



An intermediate incomplete table of an LPP by simplex method is given below (x_3, x_4, x_5 are slack/surplus variables, x_6 artificial variable) :

			c_j	3	-1	0	0	0	-M
c_B	B	x_B	b	a_1	a_2	a_3	a_4	a_5	a_6
3	a_1	x_1	1	1	1/2	-1/2	0	0	x
	a_4	x_4	2	0	5/2	1/2	1	0	x
	a_5	x_5	4	0	1	0	0	1	x
$z_j - c_j$									

Completing the table and proceeding further, the optimal solution can be obtained as

1. $x_1 = 2$, $x_2 = 1$
2. $x_1 = 3$, $x_2 = 0$
3. $x_1 = 3$, $x_2 = 2$
4. $x_1 = 2$, $x_2 = 0$

A1 : 1

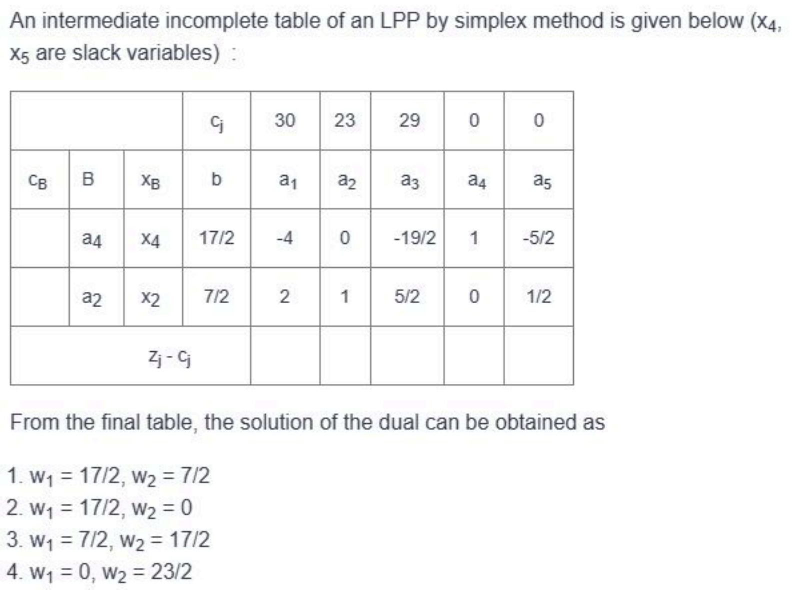
A2 : 2

A3 : 3

A4 : 4

Objective Question

34 11071034 2.0 0.00



An intermediate incomplete table of an LPP by simplex method is given below (x_4, x_5 are slack variables) :

			c_j	30	23	29	0	0
c_B	B	x_B	b	a_1	a_2	a_3	a_4	a_5
	a_4	x_4	17/2	-4	0	-19/2	1	-5/2
	a_2	x_2	7/2	2	1	5/2	0	1/2
$z_j - c_j$								

From the final table, the solution of the dual can be obtained as

1. $w_1 = 17/2$, $w_2 = 7/2$
2. $w_1 = 17/2$, $w_2 = 0$
3. $w_1 = 7/2$, $w_2 = 17/2$
4. $w_1 = 0$, $w_2 = 23/2$

A1 : 1

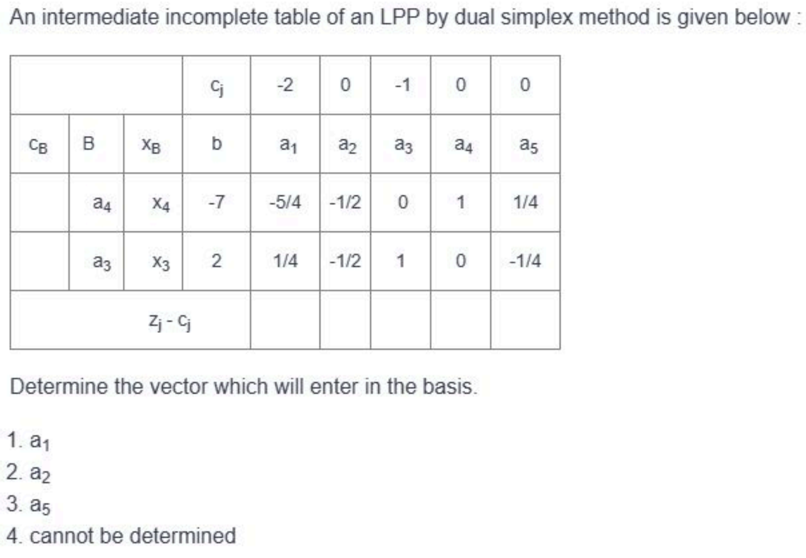
A2 : 2

A3 : 3

A4 : 4

Objective Question

35 11071035 2.0 0.00



An intermediate incomplete table of an LPP by dual simplex method is given below :

			c_j	-2	0	-1	0	0
c_B	B	x_B	b	a_1	a_2	a_3	a_4	a_5
	a_4	x_4	-7	-5/4	-1/2	0	1	1/4
	a_3	x_3	2	1/4	-1/2	1	0	-1/4
$z_j - c_j$								

Determine the vector which will enter in the basis.

1. a_1
2. a_2
3. a_5
4. cannot be determined

A1 : 1

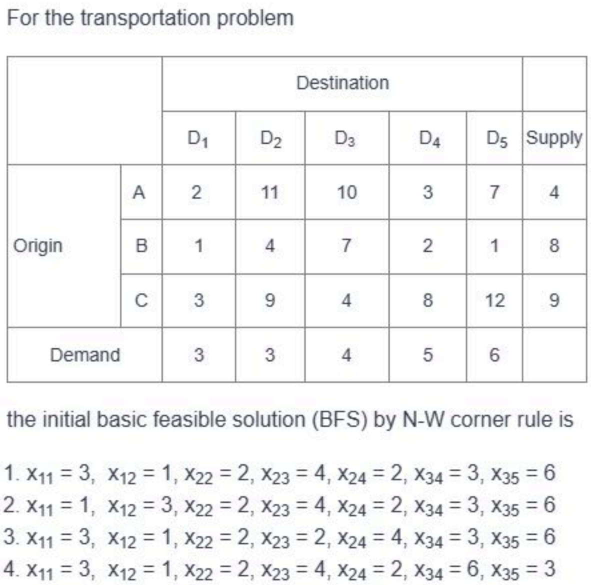
A2 : 2

A3 : 3

A4 : 4

Objective Question

36 11071036 2.0 0.00



For the transportation problem

		Destination					
		D_1	D_2	D_3	D_4	D_5	Supply
Origin	A	2	11	10	3	7	4
	B	1	4	7	2	1	8
	C	3	9	4	8	12	9
Demand		3	3	4	5	6	

the initial basic feasible solution (BFS) by N-W corner rule is

1. $x_{11} = 3$, $x_{12} = 1$, $x_{22} = 2$, $x_{23} = 4$, $x_{24} = 2$, $x_{34} = 3$, $x_{35} = 6$
2. $x_{11} = 1$, $x_{12} = 3$, $x_{22} = 2$, $x_{23} = 4$, $x_{24} = 2$, $x_{34} = 3$, $x_{35} = 6$
3. $x_{11} = 3$, $x_{12} = 1$, $x_{22} = 2$, $x_{23} = 2$, $x_{24} = 4$, $x_{34} = 3$, $x_{35} = 6$
4. $x_{11} = 3$, $x_{12} = 1$, $x_{22} = 2$, $x_{23} = 4$, $x_{24} = 2$, $x_{34} = 6$, $x_{35} = 3$

A1 : 1

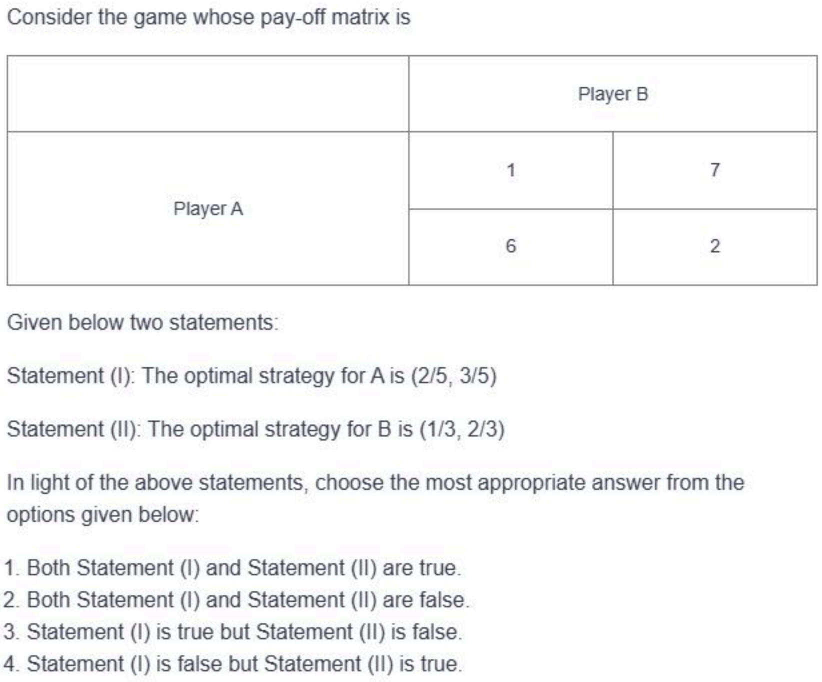
A2 : 2

A3 : 3

A4 : 4

Objective Question

37 11071037 2.0 0.00



Consider the game whose pay-off matrix is

	Player B	
Player A	1	7
	6	2

Given below two statements:

Statement (I): The optimal strategy for A is (2/5, 3/5)

Statement (II): The optimal strategy for B is (1/3, 2/3)

In light of the above statements, choose the most appropriate answer from the options given below:

1. Both Statement (I) and Statement (II) are true.
2. Both Statement (I) and Statement (II) are false.
3. Statement (I) is true but Statement (II) is false.
4. Statement (I) is false but Statement (II) is true.

A1 : 1

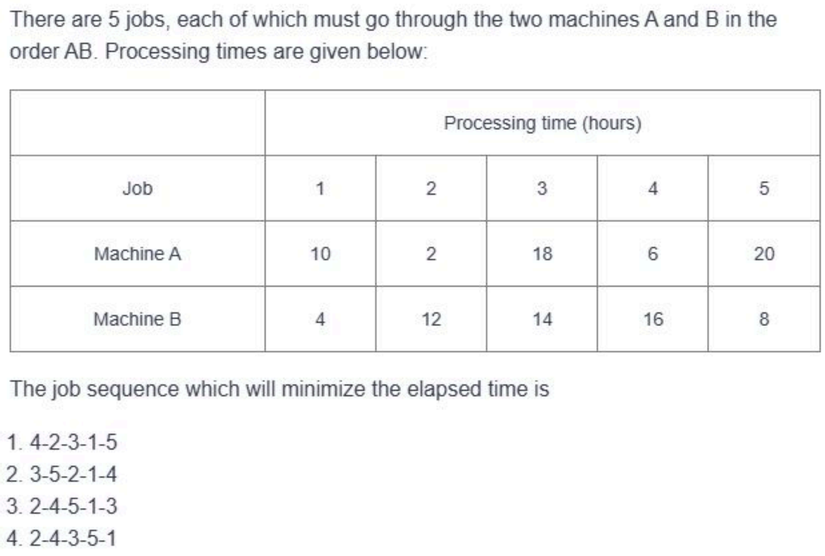
A2 : 2

A3 : 3

A4 : 4

Objective Question

38 11071038 2.0 0.00



There are 5 jobs, each of which must go through the two machines A and B in the order AB. Processing times are given below:

	Processing time (hours)				
Job	1	2	3	4	5
Machine A	10	2	18	6	20
Machine B	4	12	14	16	8

The job sequence which will minimize the elapsed time is

1. 4-2-3-1-5
2. 3-5-2-1-4
3. 2-4-5-1-3
4. 2-4-3-5-1

A1 : 1

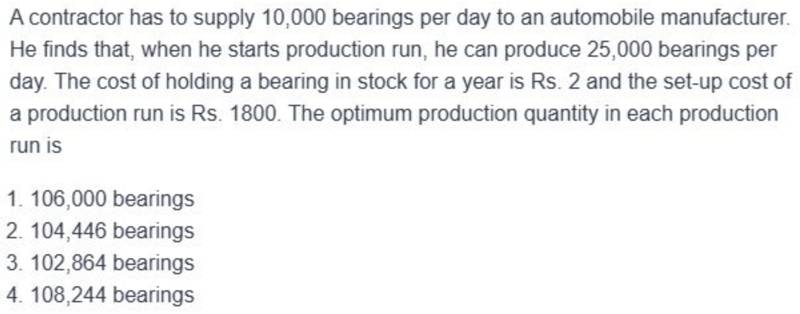
A2 : 2

A3 : 3

A4 : 4

Objective Question

39 11071039 2.0 0.00



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 bearings per day. The cost of holding a bearing in stock for a year is Rs. 2 and the set-up cost of a production run is Rs. 1800. The optimum production quantity in each production run is

1. 106,000 bearings
2. 104,446 bearings
3. 102,864 bearings
4. 108,244 bearings

A1 : 1

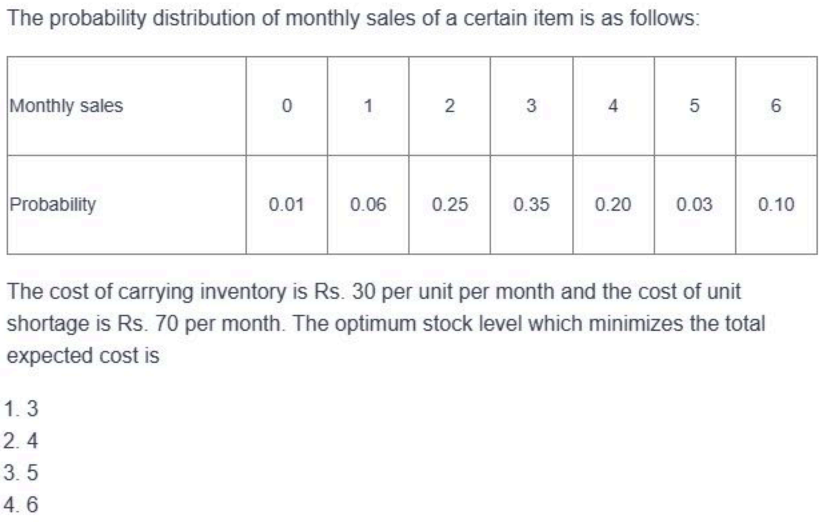
A2 : 2

A3 : 3

A4 : 4

Objective Question

40 11071040 2.0 0.00



The probability distribution of monthly sales of a certain item is as follows:

Monthly sales	0	1	2	3	4	5	6
Probability	0.01	0.06	0.25	0.35	0.20	0.03	0.10

The cost of carrying inventory is Rs. 30 per unit per month and the cost of unit shortage is Rs. 70 per month. The optimum stock level which minimizes the total expected cost is

1. 3
2. 4
3. 5
4. 6

A1 : 1

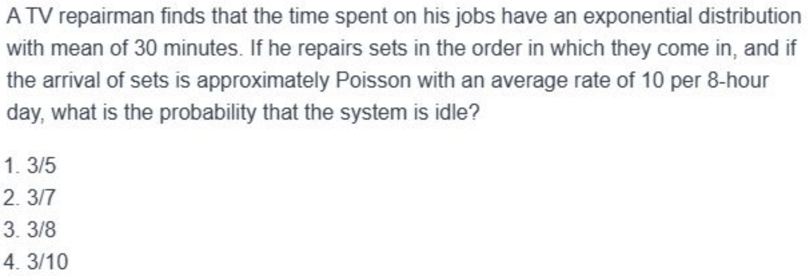
A2 : 2

A3 : 3

A4 : 4

Objective Question

41 11071041 2.0 0.00



A TV repairman finds that the time spent on his jobs have an exponential distribution with mean of 30 minutes. If he repairs sets in the order in which they come in, and if the arrival of sets is approximately Poisson with an average rate of 10 per 8-hour day, what is the probability that the system is idle?

1. 3/5
2. 3/7
3. 3/8
4. 3/10

A1 : 1

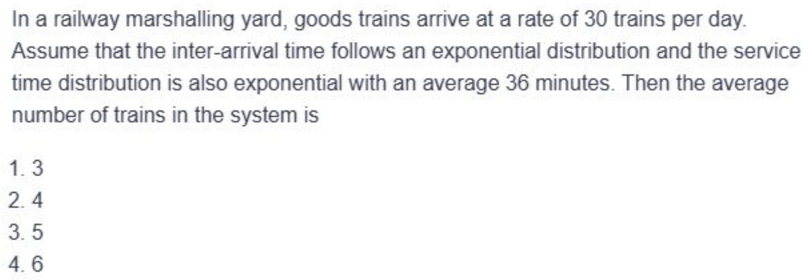
A2 : 2

A3 : 3

A4 : 4

Objective Question

42 11071042 2.0 0.00



In a railway marshalling yard, goods trains arrive at a rate of 30 trains per day. Assume that the inter-arrival time follows an exponential distribution and the service time distribution is also exponential with an average 36 minutes. Then the average number of trains in the system is

1. 3
2. 4
3. 5
4. 6

A1 : 1

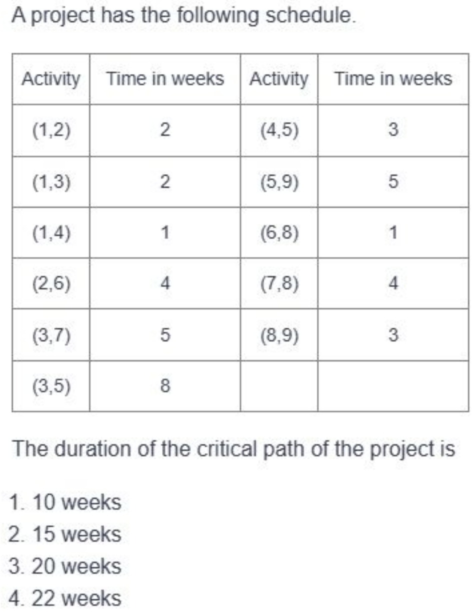
A2 : 2

A3 : 3

A4 : 4

Objective Question

43 11071043 2.0 0.00



A project has the following schedule.

Activity	Time in weeks	Activity	Time in weeks
(1,2)	2	(4,5)	3
(1,3)	2	(5,9)	5
(1,4)	1	(6,8)	1
(2,6)	4	(7,8)	4
(3,7)	5	(8,9)	3
(3,5)	8		

The duration of the critical path of the project is

1. 10 weeks
2. 15 weeks
3. 20 weeks
4. 22 weeks

A1 : 1

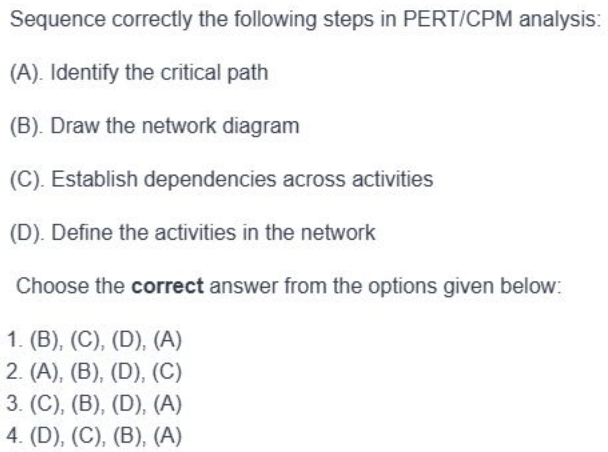
A2 : 2

A3 : 3

A4 : 4

Objective Question

44 11071044 2.0 0.00



Sequence correctly the following steps in PERT/CPM analysis:

(A). Identify the critical path

(B). Draw the network diagram

(C). Establish dependencies across activities

(D). Define the activities in the network

Choose the **correct** answer from the options given below:

1. (B), (C), (D), (A)
2. (A), (B), (D), (C)
3. (C), (B), (D), (A)
4. (D), (C), (B), (A)

A1 : 1

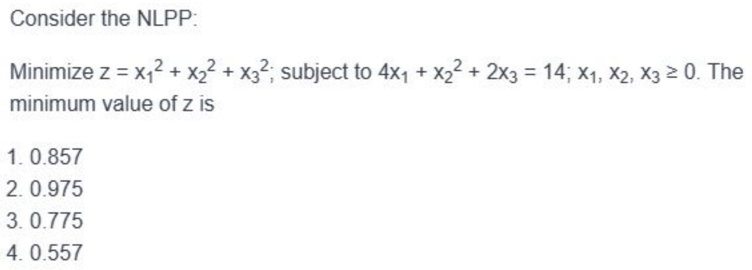
A2 : 2

A3 : 3

A4 : 4

Objective Question

45 11071045 2.0 0.00



Consider the NLPP:

Minimize $z = x_1^2 + x_2^2 + x_3^2$; subject to $4x_1 + x_2^2 + 2x_3 = 14$; $x_1, x_2, x_3 \geq 0$. The minimum value of z is

1. 0.857
2. 0.975
3. 0.775
4. 0.557

A1 : 1

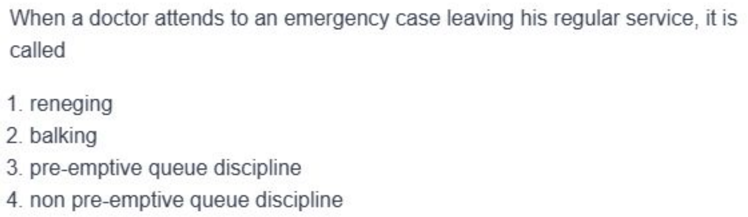
A2 : 2

A3 : 3

A4 : 4

Objective Question

46 11071046 2.0 0.00

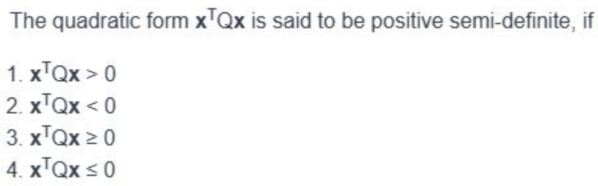


When a doctor attends to an emergency case leaving his regular service, it is called

1. reneging
2. balking
3. pre-emptive queue discipline
4. non pre-emptive queue discipline

A1 : 1

		A2 : 2 A3 : 3 A4 : 4		
Objective Question				
47	11071047	In PERT, the span of time between the optimistic and pessimistic time estimates of an activity is 1. 3σ 2. 6σ 3. 9σ 4. 12σ A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
48	11071048	Which of the following is not correct? 1. When classical method is used in solving a dynamic programming problem, the objective may be linear or non-linear, but the constraints must be non-linear. 2. Dynamic programming deals with the time-dependent decision-making problems. 3. LPP can be solved by using dynamic programming approach. 4. Optimum solution in dynamic programming problem depends on the initial solution. A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00
Objective Question				
49	11071049	In Beale's method, by increasing the value of any of the non-basic variables, the value of objective function 1. can be improved 2. cannot be improved 3. can be improved or not 4. remains invariant	2.0	0.00

		A1 : 1 A2 : 2 A3 : 3 A4 : 4		
Objective Question				
50	11071050	 The quadratic form $\mathbf{x}^T Q\mathbf{x}$ is said to be positive semi-definite, if 1. $\mathbf{x}^T Q\mathbf{x} > 0$ 2. $\mathbf{x}^T Q\mathbf{x} < 0$ 3. $\mathbf{x}^T Q\mathbf{x} \geq 0$ 4. $\mathbf{x}^T Q\mathbf{x} \leq 0$ A1 : 1 A2 : 2 A3 : 3 A4 : 4	2.0	0.00