MODEL PAPER

MB0032 Operations Research

(3 Credits)

Group A: 1 Marks Questions (Question Number 1-40)

Group B: 2 Marks Questions (Question Number 41-60)

Group C: 4 Marks Questions (Question Number 61-75)

Full Marks: 140

Please Answer All Questions – Only One Option is Correct

Group A

1. Operations Research provides

a. Earliest solution 0

b. Feasible solutions 0

c. Scientific approach to solutions **1**

d. Statistical approach to solutions 0

2. Operations Research totally eliminates

a. Quantitative approach 0

b. Intuitive approach **1**

c. Qualitative approach 0

d. Decision makers ability 0

3.

Operations Research approaches problem solving and decision making from

a. Individual's view 0

b. Departmental view 0

c. Technical view 0

d. The total system's view **1**

4. In the Research phase we decide

a. Formulation of the problems 0

b. Determination of the operation 0

c. Making recommendations 0

d. Formulation of hypothesis and model **1**

5. Graphs and charts belong to

a. Physical model **1**

b. Mathematical model 0

c. Deterministic model 0

d. General model 0

6. Existence of alternative courses of action in L.P.P is

a. An assumption 0

b. A basic requirement **1**

c. A hypothesis 0

d. An objective 0

7.

In canonical form

a. All constraints are "≥" type 0

b. Some constraints are "≥" type 0

c. Some constraints "≤" type 0

d. All constraints are "≤" type **1**

8.

$3X - 5Y \leq -15$ can be written as

a. $-3X + 5Y \leq -15$ 0

b. $3X + 5Y \geq 15$ 0

c. $-3X + 5Y \geq 15$ **1**

d. $-3X + 5Y \leq -15$ 0

9.

Any non-negative values of the variables lead to

a. Solution 0

b. Basic solution 0

c. Feasible solution **1**

d. Infeasible solution 0

10.

Optimal solution always occurs

a. Within the feasible region 0

b. On the boundaries of feasible region 0

c. At corner points of feasible region **1**

d. Anywhere 0

11.

The feasible solution to the problem exists

a. At middle of the feasible region 0

b. At the corner points of the region **1**

c. Outside the region 0

d. Located at every point 0

12.

The non-negativity conditions are expressed as

a. ≥ 0 **1**

b. ≤ 0 0

c. $= 0$ 0

d. < 0 0

13.

The standard form of L.P.P is

a. Optimize Z = $\sum_{j=1}^{n} C_i X_i$, Subject to $\sum_{j=1}^{n} a_{ij} X_j = b_i$, i = 1,….. n 0

b. Optimize Z = $\sum_{j=1}^{n} C_i X_i$, Subject to $\sum_{j=1}^{n} a_{ij} X_j > b_i$, i = 1,….. n 0

c. Optimize Z = $\sum_{j=1}^{n} C_i X_i$, Subject to $\sum_{j=1}^{n} a_{ij} X_j \geq b_i$, i = 1,….. n 0

d. Optimize Z = $\sum_{j=1}^{n} C_i X_i$, Subject to $\sum_{j=1}^{n} a_{ij} X_j \leq b_i$, i = 1,….. n **1**

14.

If in a system of m equations in n ($n \geq m$) variables, we assign n-m variables as zero then the n-m variables are called as

a. Decision variable 0

b. Slack variables 0

c. Non-basic variables **1**

d. Surplus variables 0

15.

Consider the system of equations

$2X_1 + X_2 + 3X_3 = 6$

$X_1 + 3X_2 – X_3 = 8$

Let X_3 be a non-basic variable, then value of X_1 is

a. 1 **1**

b. 0 0

c. 2 0

d. 3 0

16.

The constraint $3X_1 + 2X_2 + 7X_3 \geq 20$, in standard form is

a. $3X_1 + 2X_2 + 7X_3 + S_1 = 20$ 0

b. $3X_1 + 2X_2 + 7X_3 – S_1 + A_1 = 0$ **1**

c. $2X_1 + 3X_2 + 7X_3 + S_1 + A_1 = 0$ 0

d. $2X_1 + 3X_2 + 7X_3 – S_1 + A_1 = 0$ 0

17.

Product A takes 5 M/c hours and Product B takes 6 labour hours. The total time available for M/c hours is 36. The constraint equation for this is

a. 5X + 6Y = 36 0

b. $5X + 6Y \leq 36$ 0

c. $5X + 6Y \geq 36$ 0

d. Data incomplete **1**

18.

Dual problem is used when

a. Primal problem has constraints 0

b. Primal problem has several constraints 0

c. Primal problem has five decision variables 0

d. Primal problem has several constraints and small variables **1**

19. The constraint of the primal problem $3X_1 + 4X_2 + 5X_3 \leq 5$ in dual is changed to

a. $3X_1 + 4X_2 + 5X_3 \geq 5$ 0

b. $3X_1 + 4X_2 + 5X_3 = 5$ 0

c. $3X_1 + 4X_2 + 5X_3 \leq 5$ 0

d. Cannot be determined **1**

20. Maximize $Z = 10X_1 + 15X_2$ in dual L.P.P becomes

a. Maximize $Z = 15X_2 + 10X_1$ 0

b. Maximize $Z = 10X_1 + 15X_2$ 0

c. Minimize $W = -10X_1 - 15X_2$ 0

d. Minimize $W = 10X_1 + 15X_2$ **1**

21.

The objective function in Transportation problem is

a. Maximized 0

b. Minimized **1**

c. Optimized 0

d. Well allocated 0

22. If there are “m” origins and “n” destinations then total number of cells available for allocation is

a. mn **1**

b. m + n 0

c. m - n 0

d. n - m 0

23.

A job is assigned to

a. Only one machine **1**

b. Several machines 0

c. Only two machines 0

d. Only M/cs 0

24.

The first step in Hungarian method is

a. Prepare column reduced Matrix 0

b. Prepare Diagonal Matrix 0

c. Prepare Row reduced Matrix **1**

d. Prepare Inverse Matrix 0

25. When decision making involves no fractional values, then the technique adopted is

a. T.P 0

b. A.P 0

c. I.P.P **1**

d. L.P.P 0

26. To get integral values a new constraint know as ……. Is introduced

a. Laplacian 0

b. Hurwiez 0

c. Gomory **1**

d. Modi 0

27.

One of the following is not a example of Queue

a. Cars waiting at Petrol 0

b. Customers waiting at Bank 0

c. Arrangement of colours in a row **1**

d. Machines waiting for repair 0

28.

It may not be …… to totally avoid Queue

a. Economical **1**

b. Bad 0

c. Correct 0

d. Proper 0

29. It is possible to get ……. Performance of the system

a. Efficient **1**

b. Normal 0

c. Un interrupted 0

d. Best 0

30. Queuing theory establishes balance between

a. Customer and service 0

b. Resources and facilities 0

c. Cost and time 0

d. Customers waiting time and service capability **1**

31. Example of finite Queue is

a. Queue for Balaji Darshan 0

b. Queue at Railway counters 0

c. Queue of Machines requiring service **1**

d. Banking transaction 0

32.

The efficiency factor F is defined as

a. $F = \frac{T + W}{T + V}$ 0

b. $F = \frac{V + W}{T + V + W}$ 0

c. $F = \frac{T + W}{V + W}$ 0

d. $F = \frac{T + W}{T + V + W}$ **1**

33. Given T = 3, V = 12 then X is

a. 2/5 0

b. 3/5 0

c. 1/5 **1**

d. 4/5 0

34.

If X = 0.3, N = 2, M = 2 then H =

a. 0.0612 0

b. 0.5978 **1**

c. 0.7014 0

d. 0.6912 0

35.

Simulation is of great help for decision making when

a. Modeling is difficult 0

b. Mathematical modeling is difficult **1**

c. Statistical modeling is difficult 0

d. Variables present are two only 0

36.

Simulation can be easily understood by

a. Non-technical people **1**

b. Statistician only 0

c. Mathematician's only 0

d. O.R people only 0

37.

The first step in Simulation study is

a. Develop model 0

b. Evaluate potential costs 0

c. Define the problem **1**

d. Evaluate benefits 0

38.

Materials, Money, Manpower and space in project Managements falls under the name

a. Activities 0

b. Events 0

c. Inter related tasks 0

d. Resources **1**

39.

Game's Theory can be used in

a. Allocation of resources 0

b. Legal negotiations **1**

c. Assigning jobs to machines 0

d. Replacement policies 0

40.

A Two-person game in which gains of one player is equal to loss of other player is known as

a. Two person-zero sum game **1**

b. Zero-sum game 0

c. Person-sum-game 0

d. Two-person-sum game 0

Group B

41.

The production department wants to have a longer run so as to minimize set up costs and hence require larger inventory. But Finance department would like to minimize inventory cost. The tools that can help them

a. Belongs to OR applied to production Dept 0

b. Belongs to OR applied to Finance department 0

c. Belongs to OR applied with system overview **1**

d. Belongs to OR applied to inventory only 0

42.

Mr.Rajesh formulated objective function with variable profit"a" and constraints as follows

Max $Z = aX + 10Y$

Subject $3X + 5Y^2 \leq 10$

$4X + 3Y \geq 20 \quad X, Y \geq 0$

The formulated problem is

a. Acceptable 0

b. Not acceptable, since there are only two variables 0

c. Not acceptable, since one constraint is not expressed as linear function **1**

d. Not acceptable both objective and a constraint are expressed as linear expression 0

43.

$|3X + 4Y| \leq 40$ can be expressed as

a. $3X + 4Y \leq 40$ 0

b. $-3X - 4Y \geq 40$ and $3X + 4Y \leq 40$ **1**

c. $3X + 4Y = 40$ 0

d. $3X + 4Y \leq -40$ 0

44.

The objective function is Maximize

a. $Z = 2X + 2.5Y$ 0

b. $Z = 50X + 80Y$ **1**

c. $Z = 50X + 25Y$ 0

d. $Z = 5X + 25Y$ 0

45.

The standard form of L.P.P requires

a. Constraints to be equalities and variables to be non-negative 0

b. Constraints to be "≤" type and variables to be non-negative 0

c. Constraints to be inequalities and variables to be non-negative **1**

d. Constraints to be "≥" type and variables to be non-negative 0

46.

Optimize $Z = C^T X$

Subject to $AX = B$ and $X \geq 0$. X denotes

a. Row vector with decision variables 0

b. Row vector with slack and Artificial variables 0

c. Column vector with decision, slack, surplus and artificial variables **1**

d. Column vector with slack and surplus variables 0

47.

If we get a solution to L.P.P having three variables X_1, X_2 and X_3 as $X_1 = X_2 = 0$ $X_3 = 15$ then the solution is said to be

a. Degenerate and infeasible 0

b. Degenerate and feasible **1**

c. Non-degenerate and feasible 0

d. Non-degenerate and infeasible 0

48.

Dual L.P.P plays an important role when primal L.P.P results in

a. Infeasible solution and large constraints **1**

b. feasible solution and large constraints 0

c. Unbounded solution and large constraints 0

d. Unique solution and large constraints 0

49.

If primal L.P.P is that of Maximization and has constraints "≤" then in Dual L.P.P they are converted into

a. Minimization and "≤" 0

b. Minimization and "≥" **1**

c. Minimization and "=" 0

d. Maximization and "≥" 0

50.

Transportation model assumes

a. Number of origins = number of destinations and cost of transportation is unknown 0

b. Number of Supply units = number of demand units and cost of transportation is known and fixed **1**

c. Number of supply units ≠ number of destinations and cost is not fixed one 0

d. Number of origins ≠ number of destinations and cost is fixed 0

51.

If there are 3 rows and 5 columns then the T.P has

a. 8 constraints and 10 cell values 0

b. 8 constraints and 15 cell values **1**

c. 5 constraints and 15 cell values 0

d. 8 constraints and 15 cell values 0

Answer Question Number 52 to 55 based on the following table -

Consider the following T.P and answer from Q.4 to 11

Cost Matrix					
	Destinations				
		D_1	D_2	D_3	Available
Origin	0_1	7	6	5	20
	0_2	6	4	3	40
Demand		12	38	10	60

52. The objective function is

a. Z = 7X11 + 6X12 + 5X21 + 6X22 + 4X23 + 3X21 0

b. Z = 6X11 + 7X12 + 5X22 + 6X21 + 3X23 + 4X21 0

c. Z = 7X11 + 6X12 + 5X13 + 6X21 + 4X22 + 3X23 1

d. Z = 7X21 + 6X22 + 5X23 + 6X11 + 4X12 + 3X13 0

53. Destination constraints are

a. 7X11 + 6X21 = 12, 6X21 + 4X22 = 38 and 5X13 + 3X23 = 10 0

b. 7X11 + 6X21 = 12, 6X21 + 4X22 = 38 , 5X13 + 3X23 = 10 1

c. 7X11 + 6X21 = 12, 6X21 + 4X12 = 38 , 5X13 + 3X23 = 10 0

d. 7X11 + 6X21 = 12, 6X21 + 4X22 = 38 , 5X23 + 3X13 = 10 0

54. Origin constraints are

a. $7X11 + 6X21 \leq 20$, $6X12 + 4X22 \leq 40$ 0

b. $7X11 + 6X21 \leq 20$, $5X13 + 3X23 \leq 40$ 0

c. $6X12 + 4X22 \leq 20$, $5X13 + 3X23 \leq 40$ 0

d. $7X11 + 6X12 + 5X12 \leq 20$, $6X21 + 4X22 + 3X23 \leq 10$ 1

55. Under north-west corner rule the allocation at X12 + X22 will be

a. 8, 30 1

b. 12, 26 0

c. 8, 20 0

d. 12, 30 0

56.

The method use to solve A.P is ……. and values of X_{ij} are ……

a. NWCR, 0 0

b. VAM, 1 0

c. Modi, 0 0

d. Hungarian, 0 or 1 **1**

57.

Integer programming deals with integer solution by

a. Rounding of the fractional values to the nearest integer and applying dual simplex method 0

b. Rounding of the fractional values to the nearest integer and simplex method 0

c. Introducing Gomory's constraints and applying dual simplex method **1**

d. Introduction Gomory's constraint and applying simplex method 0

58.

As a first step in I.P.P algorithm

a. Convert minimization problems to maximisation problem and ignore integrality condition **1**

b. Convert maximisation problem to minimization and ignore integrality condition 0

c. Convert maximisation problem to minimization and consider integrality condition 0

d. Convert minimization problem to maximisation and consider integrality condition 0

59.

Criteria for measure of efficiency is given by

a. Utilization factor 0

b. Expected length of Queue **1**

c. Arrival rate 0

d. Service rate 0

60. In PERT total project duration is regarded as a

a. Variable associated with activities 0

b. Variable associated with events 0

c. Random variable with associated probabilities **1**

d. Random variable with associated with activities 0

61.

Dr.Bhaskar is the chairman of a company. He is interested in O.R and its applications. He has called MBA graduates a) Anand b) Amar c) Anil d) Arjun for interview. But he himself does not know much about O.R. There fore he calls for an O.R specialist's service. Answer Questions 1 to 4. i. He wants to know in a simple way "what does O.R stands for"	
a. Scientific method for getting optimal solution on quantitative basis	**1**
b. Methodology adopted to take decision	0
c. O.R is an aid	0
d. O.R is an art of giving bad answers to problem	0
ii. When and where OR came into existence in India?	
a. 1957, O.R.Society of India, Calcutta	0

b. 1959, Delhi conference	0
c. 1949, Regional research laboratory, Hyderabad	**1**
d. 1953, Indian Statistical Institute, Calcutta	0
iii. One of the characteristics of OR is	
a. Gives solution to problems	0
b. Make use of all available information	0
c. Does not consider human factors	0
d. Improves the quality of decisions	**1**
iv. Its process is	
a. All factors affecting the system is taken into account to form a Mathematical model and obtain solution on the system as a whole	**1**
b. Concentrates on specific problem and gives solution	0
c. Concentrates on individuals opinion to give solution that satisfies him	0
d. Concentrate on solution that will be beneficial to stake holders	0

62.

i. By effectiveness measures of a model we mean	
a. Determination of the problem type	0
b. Transferring innovations to other fields	0
c. A measure of success of the model relative to the objectives	**1**

d. Ability to forecast the problem solution with future changes	0
ii. Formulation of the problem relative to the objective comes under	
a. Research phase	0
b. Judgment phase	**1**
c. Action phase	0
d. Implementation phase	0
iii. The need for O.R in industry is due to	
a. Complexity of problem	**1**
b. Policies of Government	0
c. Scarcity of resources	0
d. Customer demand	0
iv. In both developing and developed economies O.R helps in	
a. Planning	**1**
b. Improving profit	0
c. Reducing cost	0
d. Activating	0

63.

i. Organization chart belong to	
a. Analogue model	**1**
b. Iconic model	0
c. Deterministic model	0
d. Static model	0
ii. One of the advantage of a model is	
a. Provides a logical and systematic approach	**1**
b. It does not consume time	0
c. Construction is easy	0
d. Are idea1ized representation	0
iii. The traveling salesmen problem belongs to	
a. Routing model	**1**
b. Competitive model	0
c. Sequencing model	0
d. Simulation model	0
iv. The person selected is	
a. Anand	**1**
b. Amar	0

c. Anil	0
d. Arjun	0

64.

Consider Maximize $Z = 12X_1 + 10X_2 + 15X_3$

Subject to $4X_1 + 5X_2 - 6X_3 \geq -40$

$3X_1 + 2X_2 + X_3 \leq 60$

$X_1, X_2, X_3 \geq 0$

i. To bring it to standard form, we must have

a. $4X_1 + 5X_2 - 6X_3 \leq 40$ 0

b. $-4X_1 - 5X_2 + 6X_3 \leq 40$ **1**

c. $3X_1 + 2X_2 + X_3 \leq 60$ 0

d. $3X_1 + 2X_2 + X_3 \geq -60$ 0

ii. The objective function in the dual is

a. Maximize $Z = -40Y_1 + 60Y_2$ 0

b. Minimize $Z = 40Y_1 + 60Y_2$ 0

c. Minimize $Z = -40Y_1 + 60Y_2$ **1**

d. Maximize $Z = 40Y_1 + 60Y_2$ 0

iii. One of the constraints in the dual is

a. $-4Y_1 + 3Y_2 \geq 12$ **1**

b. $4Y_1 + 3Y_2 \geq 10$ 0

c. $4Y_1 + 3Y_2 \geq 15$ 0

d. $4Y_1 + 3Y_2 \leq 12$ 0

iv. Number of constraints in the dual is

a. 1 0

b. 2 0

c. 3 **1**

d. 4 0

65.

Consider Minimize $Z = 4X_1 + 5X_2$

Subject to $3X_1 + 5X_2 \geq 15$

$2X_1 + X_2 \leq -10$

$X_1 + 3X_2 \geq 20$

$X_1, X_2 \geq 0$

i. To bring it to standard form we must

a. $2X_1 + X_2 \geq 10$ 0

b. $-2X_1 - X_2 \geq 10$ **1**

c. $2X_1 - X_2 \geq -10$ 0

d. $-2X_1 + X_2 \geq -10$ 0

ii. The number of slack, surplus and Artificial variable in the dual will be

a. 1 0

b. 3 0

c. 4 0

d. 2 **1**

iii. One of the constraints of the dual is

a. $\mathbf{3Y_1 + 2Y_2 \leq 4}$ 0

b. $\mathbf{3Y_1 + 2Y_2 \leq 4}$ 0

c. $\mathbf{5Y_1 + 2Y_2 + Y_3 \leq 5}$ 0

d. $\mathbf{3Y_1 - 2Y_2 + Y_3 \leq 5}$ **1**

iv. The number of constraints in dual is

a. 2 **1**

b. 1 0

c. 3 0

d. 4 0

66.

Consider Maximize $Z = 16X_1 + 20X_2$

Subject to $4X_1 + 5X_2 \leq 40$

$X_1 + X_2 = 20$

$X_1 \geq 0$ X_2 is unrestricted in size

i. The second constraint in the standard form is written as

a. $\mathbf{X_1 + (X_2^1 - X_2^{11}) \leq 20}$ and $-X_1 - (X_2^1 - X_2^{11}) \leq -20$ **1**

b. $\mathbf{X_1 + (X_2^1 - X_2^{11}) \leq 20}$ and $-X_1 + (X_2^1 - X_2^{11}) \leq 20$ 0

c. $\mathbf{X_1 + (X_2^1 - X_2^{11}) \leq 20}$ and $X_1 - (X_2^1 - X_2^{11}) \leq -20$ 0

d. $\mathbf{X_1 + (X_2^1 - X_2^{11}) \leq 20}$ and $-X_1 + (X_2^1 - X_2^{11}) \leq -20$ 0

ii. The objective function in dual is

a. $\mathbf{Minimize\ Z = 16Y_1 + 20Y_2}$ 0

b. $\mathbf{Minimize\ Z = 40Y_1 + 20Y_2}$ **1**

c. $\mathbf{Minimize\ Z = 40Y_1 + 20Y_2^1}$ 0

d. $\mathbf{Minimize\ Z = 40Y_1 + 20Y_2^{11}}$ 0

iii. The variable that could come as unrestricted in dual is

a. $\mathbf{Y_1}$ 0

b. $\mathbf{Y_2^1}$ 0

c. $\mathbf{Y_2^{11}}$ 0

d. $\mathbf{Y_2}$ **1**

iv. One of the constraint in the dual is

a. $\mathbf{5Y_1 + Y_2 \geq 20}$ 0

b. $\mathbf{5Y_1 + Y_2 \leq 20}$ 0

c. $5Y_1 + Y_2 = 20$ **1**

d. $5Y_1 – Y_2 = 20$ 0

67.

Consider the following final simplex table for maximisation

		X_1	X_2	X_3	S_1	S_2	S_3	Qty
10	X_2	1/3	1	0	1/3	-1/6	0	8
8	X_3	2/3	0	1	-1/3	5/12	0	10
0	S_3	-8/3	0	0	1/3	-17/12	1	18

i. The value of X_1 is

a. 0 **1**

b. +26/3 0

c. 16/3 0

d. 10/3 0

ii. The value of S_3 means

a. 18 units are consumed **1**

b. 18 units still left over 0

c. 18 units are short 0

d. Nothing can be said 0

iii. An increase of one unit in resource S_2 will increase the contribution by

a. 1/3 0

b. 2/3 0

c. 4/3 0

d. 5/3 **1**

iv. A decrease of one unit in resource S_1 will affect the contribution by

a. -2/3 **1**

b. -4/3 0

c. 2 0

d. 1 0

68.

i. The small quantity "$\in$" has to be introduced in NWCR solution to move towards optimality at

a. X_{24} **1**

b. X_{14} **0**

c. X_{21} 0

d. X_{23} 0

ii. In LCM solution "$\in$" has to be introduced at

a. X_{21} 0

b. X_{12} 0

c. X_{14} **1**

d. X_{23} 0

iii. In VAM solution at

a. X_{12} 0

b. X_{21} 0

c. X_{23} 0

d. X_{14} **1**

iv. The first highest penalty by VAM method occurs at

a. P_1 row 0

b. W_3 column **1**

c. P_3 row 0

d. W_4 column 0

69.

If we take $U_1 = 0$, most negative value cell

i. By VAM method is

a. (P_1, W_2) 0

b. (P_2, W_1) 0

c. No where **1**

d. (P_i, W_3) 0

ii. By NWCR method is

a. (P_1, W_2) 0

b. (P_1, W_3) 0

c. (P_1, W_4) 0

d. (P_1, W_4) **1**

iii. By LCM method is

a. (P_1, W_4) 0

b. (P_2, W_3) **1**

c. (P_1, W_3) 0

d. (P_2, W_1) 0

iv. The Basic solution by NWCR leads to a transportation cost of

a. 2450 **1**

b. 2550 0

c. 2350 0

d. 2000 0

70.

The first horizontal or vertical line is drawn

i. In VAM solution, between the cells

a. (P_1, W_2) and (P_2, W_4) 0

b. (P_3, W_3) and (P_3, W_4) 0

c. (P_3, W_2) and (P_3, W_4) **1**

d. None 0

ii. In NWCR solution between the cells,

a. (P_1, W_4) and (P_2, W_2) **1**

b. (P_1, W_2) and (P_1, W_4) 0

c. (P_1, W_2) and (P_2, W_3) 0

d. (P_1, W_2) and (P_1, W_3) 0

iii. In LCM solution between the cells

a. (P_2, W_2) and (P_2, W_3) 0

b. (P_1, W_2) and (P_2, W_1) **1**

c. (P_1, W_2) and (P_1, W_3) 0

d. (P_1, W_1) and (P_1, W_3) 0

iv. The basic solution for total transportation cost by LCM method is

a. 2000 0

b. 2300 0

c. 2100 **1**

d. 2400 0

71.

In the second iteration of NCWR method towards optimality taking $U_1 = 0$

i. The value of V_3 is

a. 11 **1**

b. 10 0

c. 9 0

d. 8 0

ii. The most negative cell is

a. (P_1, W_2) 0

b. (P_1, W_3) 0

c. (P_2, W_3) **1**

d. (P_2, W_1) 0

iii. In the next iteration the most negative cell is

a. (P_1, W_2) 0

b. (P_1, W_3) 0

c. (P_2, W_3) **1**

d. (P_2, W_1) 0

iv. The optimal solution is

a. 2400 0

b. 2070 **1**

c. 2100 0

d. 2300 0

72.

Daily milk products knows that the demand for its ghee bottles varies with the following probability distribution. Its cost price is Rs.70 and selling price is Rs.100. A dealer wants to determine his average profit for the next 10 months

Demand	200	220	240	260	280	300
Probability	0.05	0.20	0.25	0.30	0.15	0.05

Use the following random numbers 32, 47, 92, 80, 15, 27, 56, 67, 78, 02

i. The random numbers assigned to demand are

a. 25-49 0

b. 80-94 0

c. 50-79 **1**

d. 5-24 0

ii. The simulated demand for random number 85 is

a. 280 **1**

b. 260 0

c. 240 0

d. 300 0

iii. The average demand for first five trials is

a. 280 0

b. 252 **1**

c. 260 0

d. 248 0

iv. The total profit for the 10 trials is

a. 4960 0

b. 48600 0

c. 49600 **1**

d. 49200 0

73.

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iv. The total profit for the 10 trials is

a. 4960 0

b. 48600 0

c. 49600 **1**

d. 49200 0

iv. The seventh customer arrives at

a. 10.19 **1**

b. 11.00 0

c. 10.30 0

d. 10.40 0

75.

i. The service for 5^{th} customer starts at

a. 9.30 0

b. 9.57 **1**

c. 10.00 0

d. 9.15 0

ii. The service for 8th customer starts at

a. 10.10 0

b. 10.12 0

c. 10.29 **1**

d. 10.15 0

iii. The 3rd customer has to wait for

a. 2 mts **1**

b. 1 mts 0

c. 0 mts 0

d. 3 mts 0

iv. The service station waits for the fourth customer by

a. 2 mts 0

b. 0 mts **1**

c. 1 mts 0

d. 3 mts 0