11. What do you mean by unbalanced transportation problem? Explain how to convert the unbalanced transportation problem in to a balanced transportation problem.

12. Explain clearly the difference between the following :

    (i) Pay-off and Opportunity Loss

    (ii) Expected Monetary Value and Expected Opportunity Loss.

    (iii) Maximin and Maximax decision-rules.

13. Discuss any two methods of finding initial solution of a transportation problem and two areas of application for them.

(20518) **Roll No.....**

BBA-IV Sem.

18060

B.B.A. Examination, May-2018

Operation Research

(BBA-406)

(New)

Time : Three Hours] *[Maximum Marks : 75*

Note : Attempt questions from **all** Sections as per instructions. Calculator may be used.

Section-A

(Very Short Answer Questions)

Note : Attempt all the **five** questions. Each question carries **3** marks. Very short answer is required not exceeding 75 words. 3×5=15

1. What is Operation Research?
2. What do you mean by MODI method?
3. Explain North West Corner Rule of Transportation Problem.

63

4. Explain PERT.

5. Explain CPM.

Section - B

(Short Answer Questions)

Note : Attempt any **two** questions out of the following three questions. Each question carries 7½ marks. Short answer is required not exceeding 200 words.

$7½ \times 2 = 15$

6. Discuss the Nature, Definition & Characteristics of Operations Research.

7. Consider the problem of assigning 5 jobs to 5 persons. The costs are given as below :

Persons	Jobs				
	1	2	3	4	5
A	8	4	2	6	1
B	0	9	5	5	4
C	3	8	9	2	6
D	4	3	1	0	3
E	9	5	8	9	5

8. Discuss the Applications areas of Linear Programming.

Section-C

(Detailed Answer Questions)

Note : Attempt any **three** questions out of the following **five** questions. Each question carries 15 marks. Answer is required in detail. $15 \times 3 = 45$

9. Maximise $Z = 28x_1 + 30x_2$

Subject to $6x_1 + 3x_2 \leq 18$

$3x_1 + x_2 \leq 8$

$4x_1 + 5x_2 \leq 30$

$x_1, x_2 \geq 0$

10. Find an optimal solution to the following transportation problem :

Sources	Destination			Supply
	X	Y	Z	
A	2	7	4	50
B	3	3	7	70
C	5	4	1	80
D	1	6	2	140
Demand	70	90	180	340

62

10. Explain Simplex method of solving linear programming problem. 15

11. Explain the following in the context of Transportation problem : 15
    (i) Stepping stone method
    (ii) Degenerate transportation problems
    (iii) Modified distribution method.

12. Solve the transportation problem. The matrix shows the cost of transportation : 15

Table

From	To			Supply
	1	2	3	
A	10	18	9	100
B	4	3	11	200
C	6	9	15	400
Demand	250	150	300	700

Total

13. What do you understand by decision tree analysis ? What is node in a decision tree ? What is backward pass ? 15

N

(20517) Roll No. .....

BBA-IV Sem.

18060

B. B. A. Examination, May 2017

Operation Research

BBA-406

(New)

Time : Three Hours] *[Maximum Marks : 75*

Note : Attempt questions from all Sections as per instructions. Calculator may be used.

Section-A

(Very Short Answer Questions)

Attempt all the *five* questions. Each question carries 3 marks. Very short answer is required not exceeding 75 words. 3×5=15

1. Explain three characteristics of Operation Research. 3

52

2. Give two advantages of linear programming. 3

3. What do you understand by MODI method ? 3

4. Define PERT. 3

5. Define North West Corner Rule. 3

Section-B

(Short Answer Questions)

Attempt any *two* questions out of the following three questions. Each question carries 7½ marks. Short answer is required not exceeding 200 words. 7½×2=15

6. Discuss the significance and scope of OR in modern management. 7½

7. A firm manufactures two items. It purchases casting which are then machined, bored and polished. Castings for items 'A' and 'B' cost ₹ 2 and ₹ 3 respectively and are sold at ₹ 5 and ₹ 6 each respectively. Running costs of the three machines are ₹ 20, ₹ 14 and ₹ 17.50 per hour respectively. Capacities of the machines are : 7½

	Part-A	Part-B
Machining capacity	25/hr	40/hr
Boring capacity	28/hr	35/hr
Polishing capacity	35/hr	25/hr

Formulate the L.P. model to determine the product mix that maximizes the profit.

8. Discuss in detail the role of linear programming in managerial decision-making. 7½

Section-C

(Detailed Answer Questions)

Attempt any *three* questions out of the following five questions. Each question carries 15 marks. Answer is required in detail. 15×3=45

9. Maximize $Z = 80x_1 + 120x_2$ 15

Subject to $x_1 + x_2 \leq 9,$

$20x_1 + 50x_2 \leq 360,$

$x_1 \geq 2,$

$x_2 \geq 3,$

$x_1, x_2 \geq 0.$

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11. Determine an initial basic feasible solution to the following transportation problem using column minima method : 15

	To			Available
	10	13	6	10
From	16	7	13	12
	8	22	2	8
Requirement	6	11	13	30 (Total)

12. Explain the minimax and maximin principles. 15

13. A small project consists of six activities. The duration (in days) of each activity and their immediate predecessors are shown below :

Activity	Immediate Predecessors	Duration (days)
A	–	5
B	–	3
C	–	7
D	A,B	8
E	B	4
F	B,C	5

(i) Draw the network.

(ii) Find the critical path. 15

V

(20516) Roll No. .....

BBA-IV Sem.

18060

B. B. A. Examination, May 2016

Operation Research

(BBA-406)

(New)

Time : Three Hours] *[Maximum Marks : 75*

Note : Attempt questions from all Sections as per instructions. Calculator may be used.

Section-A

(Very Short Answer Questions)

Attempt all the *five* questions. Each question carries 3 marks. 3×5=15

1. What do you understand by model building ? 3

2. Define Tree diagram in short. 3

3. Give three advantages of linear programming. 3

40

4. Define uncertainty criteria. 3

5. Define time estimates in Network analysis. 3

Section-B

(Short Answer Questions)

Attempt any *two* questions out of the following three questions. Each question carries 7½ marks. 7½×2=15

6. What are the different types of models used in Operation Research ? 7½

7. What do you understand by Operation Research ? Discuss its importance. 7½

8. A plant manufactures washing machines and dryers. The major manufacturing departments are the stamping deptt., motor and transmission deptt. and assembly deptt. The first two departments produce parts for both the products while the assembly lines are different for the two products.

The monthly deptt. capacities are–Stamping deptt.–1,000 washers or 1,000 dryers

Motor and transmission deptt.–1,600 washers or 7,000 dryers

Washer assembly line–9,000 washers only

Dryer assembly line–5,000 dryers only.

Profits per piece of washers and dryers are Rs. 2,700 and Rs. 3,000 respectively. Formulate the LP model. 7½

Section-C

(Detailed Answer Questions)

Attempt any *three* questions out of the following five questions. Each question carries 15 marks. 15×3=45

9. Find the minimum value of :

$$Z = 5x_1 - 2x_2$$

Subject to $2x_1 + 3x_2 \geq 1$, where $x_1 \geq 0$ and $x_2 \geq 0$. 15

10. Give three variations in transportation problems. How are these resolved ? 15

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11. The following table gives the pay-offs of three Acts–A_1, A_2 and A_3 and three states of nature–θ_1, θ_2, θ_3 and the prior probabilities associated with the states of nature. Calculate the expected monetary values and decide as to which course of action is the best one :

States of nature	Probabilities	Alternative Acts–A		
		A_1	A_2	A_3
θ_1	0.1	125	–20	–125
θ_2	0.7	500	540	500
θ_3	0.2	650	740	750

12. Explain the statistical decision theory. Discuss its scope, utility and limitations.

13. What is Assignment Problem ? It is true to say that it is a special case of the transportation problem ? Explain.

(20519) Roll No. .....

Total Questions : **13**] [Printed Pages : **4**

18060

B.B.A. IVth Semester Examination, May-2019

OPERATION RESEARCH

(BBA–406)

Time : 3 Hrs.] *[M.M. : 75*

Note :– Attempt questions from all Sections as per instructions. Calculator may be used.

Section–A

(Very Short Answer Type Questions)

Note :– Attempt all the *five* questions. Each question carries 3 marks. Very short answer is required not exceeding **75** words.

1. What do you mean by Operation Research ?

2. Define PERT.

3. Give three advantages of linear programming.

4. What is CPM ?

5. What is EMV ?

Section–B

(Short Answer Type Questions)

Note :– Attempt any *two* questions out of the following three questions. Each question carries 7½ marks. Short answer is required not exceeding **200** words.

6. Discuss the importance of operation research in management.

7. Explain the role of linear programming in managerial decision-making.

8. Find the maximum value of $z = 60x_1 + 30x_2$ x_1, $x_2 \geq 0$.

   Subject to the following constraints :

$$6x_1 + 3x_2 \leq 90$$

$$3x_1 + 6x_2 \leq 72$$

Section–C

(Long Answer Type Questions)

Note :– Attempt any *three* questions out of the following five questions. Each question carries 15 marks. Answer is required in detail.

9. Obtain the initial feasible solution of a transportation problem by North-West corner method whose cost and rim requirement table is given below :

Plant	Warehouse			Supply
	W_1	W_2	W_3	
P_1	7	6	9	20
P_2	5	7	3	28
P_3	4	5	8	17
Demand	21	25	19	65

10. Explain Simplex method of solving linear programming problem.