



HH-010-001510

Seat No. _____

B. B. A. (Sem. V) (CBCS) Examination

May / June - 2017

Operation Research - 01

(New Course)

Faculty Code : 010

Subject Code : 001510

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

- Instructions :** (1) Write answer of all questions in main answer sheet.
(2) Q.1 to Q.5 each carries 14 marks.

1 Explain methods of collection of primary data and secondary data. **14**

OR

1 Explain : Meaning of Research. **14**

2 (A) Explain the graphical method of solving a L.P.P. **6**

(B) Solve the following LLP using graphical method **8**

$$\begin{aligned} \text{Maximize} \quad & Z = 4x_1 + 6x_2 \\ \text{Subject to} \quad & x_1 + x_2 = 5, \\ & x_1 \geq 2, \quad x_2 \leq 4, \\ & x_1, x_2 \geq 0 \end{aligned}$$

OR

2 Solve the following LLP using simplex method. **14**

$$\begin{aligned} \text{Maximize} \quad & Z = 4x + 3y + 6z \\ \text{Subject to} \quad & 2x + 3y + 2z \leq 440 \\ & 4x + 3z \leq 470 \\ & 2x + 5y \leq 430 \\ & x_1, y_2 \geq 0 \end{aligned}$$

3 (A) Explain : North-West corner method. 6

(B) Solve the following TP by NWCM method 8

<i>From/To</i>	W_1	W_2	W_3	W_4	<i>Supply</i>
F_1	30	25	40	20	100
F_2	29	26	35	40	250
F_3	31	33	37	30	150
Demand	90	160	200	50	

OR

3 (A) Explain : VAM. 6

(B) Determine an initial basic feasible solution to the following TP by using VAM 8

		Destination				
		D_1	D_2	D_3	D_4	<i>Supply</i>
Source	A	1	2	1	4	30
	B	3	3	2	1	50
	C	4	2	5	9	20
<i>Demand</i>		20	40	30	10	

4 Discuss the solution of the Assignment models in detail. 14

OR

4 Five jobs are to be processed and five machines are available. Any machine can process any job with resulting profit (in rupees) as follows. 14

		Machines				
		A	B	C	D	E
<i>Jobs</i>	1	32	38	40	28	40
	2	40	24	28	21	36
	3	41	27	33	30	37
	4	22	38	41	36	36
	5	29	33	40	35	39

Find the assignment pattern that maximises the sales.

- 5 (A) Explain : Wilcoxon signed rank set. **6**
- (B) Test the H_0 of no difference between the ages of male and female employees of a certain company using the Mann - Whitney U test for the sample data use the 0.1 level of significance. **8**
- Males : 31 25 38 33 42 40 44 26 43 35
 Females : 44 30 34 47 35 32 35 47 48 34

OR

- 5 (A) Explain : Importance of Non-Parametric test. **6**
- (B) Use the sign test to see whether there is a difference between the no. of days required to collect an account receivable before and after a new collection policy. Use the 0.05 significance level. **8**
- Before : 33 36 41 32 39 47 34 29 32 34 40 42 33 36 29
 After : 35 29 38 34 37 47 36 32 30 34 41 38 37 35 28
