JAD-010-001510 Seat No. _____

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

October - 2019

Operation Research - I

(Old Course)

Faculty Code : 010
Subject Code : 001510

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) Attempt all five questions.
(2) Each question carries equal marks.
(3) Use of Statistical table is permissible.

1 (a) Explain meaning and objectives of research. **7**

(b) Explain the principles of good research. **7**

OR

1 (a) Discuss various types of research. **7**

(b) Explain the difference between primary data and secondary data. **7**

2 (a) Explain advantages and characteristics of non-parametric test. **7**

(b) Explain sign test for paired data. **7**

OR

2 Three groups of students of a class were taught by 3 different methods of finding solution of equations of two variables. Test results are as follows : **14**

	A :	27	30	26	32	37	15	
Methods	B :	29	31	7	19	33	14	38
	C :	40	12	24	25	35		

Using Krushkal Wallis test, whether three methods are equal or not ?

3 What is an assignment problem ? Describe Hungarian assignment method for solving an assignment problem. **14**

OR

3 5 men are available to do 5 different jobs from past records, the time in minutes that each man takes to do each job is known and given in the following table : **14**

		Jobs				
		1	2	3	4	5
Men	*A*	85	75	65	125	75
	B	90	78	66	132	78
	C	75	66	57	114	69
	D	80	72	60	120	72
	E	76	64	56	112	68

Find the assignment of men to jobs that will minimize the total time taken.

4 What is L.P.P. ? State its assumptions, limitations and uses. **14**

OR

4 Solve the following L.P.P. using graphic method : **14**

Maximize $Z = 80x_1 + 120x_2$

Subject to $x_1 + x_2 \leq 9$

$x_1 \geq 2$

$x_2 \geq 3$

$20x_1 + 50x_2 \leq 360$

$x_1, x_2 \geq 0$

5 (a) What is T.P. ? Explain difference between an A.P. and a T.P. **7**

(b) Determine an initial basis feasible solution to the following T.P. using VAM : **7**

		Destinations				
		D_1	D_2	D_3	D_4	Supply
Origins	A	19	30	50	10	7
	B	70	30	40	60	9
	C	40	8	70	20	18
Demand		5	8	7	14	

OR

5 (a) Explain MODI method. **7**

(b) Determine an initial basic feasible solution to the following T.P. by using : **7**

(1) N-W corner rule

(2) LCM

		Destinations					
		A	B	C	D	E	Supply
Origins	O_1	5	7	6	8	9	20
	O_2	9	8	10	4	11	35
	O_3	10	12	9	7	8	40
	O_4	6	6	7	8	8	15
Demand		15	10	20	30	35	