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

May / June – 2015

510 : Operation Research - 01

Faculty Code : 010
Subject Code : 001510

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

Instructions: (1)   Give answer in main answer sheet only.

(2)   Right hand side figures show marks of each question.

1   M.C.Q.   **20**

(1)   Which two of the following hypothesis are decided by the researcher ?

(A)   Null and alternative hypothesis

(B)   Systematic and non-systematic hypothesis

(C)   National and International hypothesis

(D)   Internal and external hypothesis

(2)   Periodical, journals, published literature etc. are the sources to collect _____.

(A)   Secondary data   (B)   Primary data

(C)   Both (A) and (B)   (D)   None of these

(3)   Which is not the sources of collection of secondary data ?

(A)   Government publication

(B)   Questionnaire

(C)   International Publication

(D)   Autonomous education institutions

(4)   If two constraints do not intersect in the positive quadrant of the graph then

(A)   The solution is unbounded

(B)   The problem is infeasible

(C)   One of the constraints is redundant

(D)   None of these

(5) While solving a L.P. model graphically the area bounded by the constraints is called

(A) Unbounded solution (B) Infeasible solution

(C) Feasible solution (D) None of these

(6) For a maximization problem, the objective function coefficient for an artificial variable is

(A) O (B) + M

(C) – M (D) None of these

(7) To convert $\geq$ inequality constraints into equality constraints, we must

(A) Add a surplus variable

(B) Subtract an artificial variable

(C) Add a surplus variable and subtract an artificial variable

(D) Subtract a surplus variable and add an artificial variable

(8) The best use of L.P. technique is to find an optimal use of

(A) Money (B) Manpower

(C) Machine (D) All of these

(9) When total supply is equal to total demand in a transportation problem, The problem is said to be

(A) Balanced (B) Unbalanced

(C) Degenerate (D) None of these

(10) The hungarian method for solving an assignment problem can also be used to solve

(A) A travelling salesman problem

(B) A transportation problem

(C) Both (A) and (B)

(D) None of these

(11) The solution to a transportation problem with m rows and n columns is feasible if number of positive allocations are :

(A) $m + n + 1$

(B) $m + n - 1$

(C) $m + n$

(D) $m \times n$

(12) Which of the following methods is used to verify the optimality of the current solution of the T.P.?

(A) LCM

(B) MODI method

(C) VAM

(D) None of these

(13) An assignment problem can be solved by

(A) Simplex method

(B) Transportation method

(C) Both (A) amd (B)

(D) None of these

(14) The method used for solving an assignment problem is called

(A) Reduced matrix method

(B) MODI method

(C) Hungarian method

(D) None of these

(15) An assignment problem is a special case of transportation problem, where

    (A) Number of rows equal to number of columns

    (B) All rim conditions are 1

    (C) Values of each decision variable is either 0 or 1

    (D) All of these

(16) The assignment problem

    (A) Requires that only one activity be assigned to each resource

    (B) Is a special case of T.P.

    (C) Can be used to maximize resources

    (D) All of the above

(17) _____ known as Rank sum Test

    (A) Mann Whitney test

    (B) Wilcoxon match pair test

    (C) Wald Walfowitz test

    (D) None of these

(18) _____ test is analogous to the one way analysis of variance.

    (A) Sign test   (B) Kruskal Wallis test

    (C) Wald Walfowitz test   (D) None of these

(19) In the Kruskal Wallis test of K samples, the appropriate number of degree of freedom is

    (A) K   (B) n - K

    (C) K - 1   (D) n

(20) In which test the pre assumption is not done for the form of universal distribution ?

    (A) F-test   (B) T-test

    (C) Parametric test   (D) Non–Parametric test

2 Explain types and sources of secondary data. **10**

OR

2 Explain meaning, object and types of research. **10**

3 What is linear programming ? What are its major assumptions and limitations. **10**

OR

3 A firm makes two products X and Y, and has a total production capacity of 9 tonnes per day. X and Y requiring the same production capacity. The firm has a permanent contract to supply at least 2 tonnes of X and at least 3 tonnes of Y per day to another company. Each tonne of X requires 20 machine hours production time and each tonnes of Y requires 50 machine hours production time. The daily maximum possible number of machine hours is 360. All the firms output can be sold and the profit made is Rs. 80 per tonne of X and 120 per tonne of Y. It is required to determine the production schedule for maximum profit and to calculate this profit. 10

4 Explain : **10**

(i) N-W Corner method

(ii) Vogel's approximation method

OR

4 Find out the optimum solution for transporting the products at a minimum cost for the following transportation problem with cost structure as follows : **10**

		W_1	W_2	W_3	W_4	Supply
		Warehouses				
Plants	P_1	19	30	50	12	7
	P_2	70	30	40	60	10
	P_3	40	10	60	20	18
Demand		5	8	7	15	

5 Describe hungarian method for solving an assignment problem. **10**

OR

5 A captain of a cricket team has to allot five middle batting positions to five batsmen. The average runs scored by each batsmen at these positions are as follows. **10**

Batting Positions

Batsmen		1	2	3	4	5
	A	40	40	35	25	50
	B	42	30	16	25	27
	C	50	48	40	60	50
	D	20	19	20	18	25
	E	58	60	59	55	53

Make the assignment so that the expected total average runs scored by these batsmen are maximum.

6 Explain advantages, limitations and important characteristics of non-parametric test. **10**

OR

6   Three groups of students of a class were taught by 3   **10**
different methods of finding solution of equations of two
variables. Test results are as follows :

	A	14	6	4	11	12			
Methods	B	7	16	9	14	17	5	4	
	C	3	10	13	8	15	19	21	23

Using Kruskal Wallis test, whether three methods are equal
or not.

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