ST. JOSEPH'S COLLEGE (AUTONOMOUS) BENGALURU-27
MID SEMESTER EXAMINATION- AUGUST 2019
B.COM V SEMESTER
BC5316 / BPS5316: OPERATIONS RESEARCH

TIME: 1 Hour **MAX. MARKS: 30 Marks**

SECTION A

Answer any FIVE of the following questions. **(5x2=10)**

1. Give the meaning of Operations Research.
2. What is a surplus variable?
3. How is Operations Research used in logistics?
4. What is an unbalanced transportation problem? What is the adjustment?
5. State any four OR tools.
6. Convert the following LPP into standard form
   Minimize $Z = 2x_1 + 5x_2$
   Subject to:
   $x + y = 50$
   $x - y \geq 10$
   where $x,y \geq 0$
7. State any two limitations of Operations Research.

SECTION B

Answer any TWO of the following questions. **(2x5=10)**

8. Write the dual of:
   Minimize $Z = 3x + 4y - z$
   Subject to:
   $x + y + z \leq 10$
   $2x \geq 50$
   $x - z = 20$
   where: $x,y, \geq 0$ and z is unrestricted.
9. Solve the following LPP using Simplex method
   Maximize $Z = 10x + 20y$
   Subject to:
   $4x + 2y \leq 30$
   $2x + y \leq 20$
   where $x,y \geq 0$
10. Find the initial solution to the following transportation problem using NWCM and LCM method

Destination / Production Centre	I	II	III	IV	Supply
MG Road	30	150	90	57	21
Indiranagar	60	210	24	120	54
Koramangala	180	120	90	210	27
Shantinagar	42	21	24	15	

SECTION C

Answer the following compulsory question. **(1x10=10)**

11. Formulate and solve by graphical method.

A firm that assembles computers is about to start production of two new types of computers. Each type will require assembly time, inspection time and storage space. The manager of the firm would like to determine the quantity of each type of computer to be produced in order to maximize the profit generated by the sales of these computers. Profit per unit of computer Type1 is Rs.600 and computer Type 2 is Rs.500. The following information has been obtained by the manager after discussing with design manufacturing and marketing personnel.

Data	Computer Type 1	Computer Type 2	Amount Available
Assembly time Per unit	4hrs	10hrs	40hrs
Inspection time Per unit	2hrs	1hr	12hrs
Storage Space	3 cubic meters	3 cubic meters	21 cubic meters

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