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63/2 (SEM-3) MCO 303

2021

(held in 2022)

COMMERCE

(Theory Paper)

Paper Code : MCO-303

(Operation Research and Computer Application)

Full Marks – 80

Time – Three hours

The figures in the margin indicate full marks
for the questions.

1. Answer the following multiple choice questions :
1×8=8

(i) Operation research approach is –

- (a) Scientific
- (b) Intuitive
- (c) Multi-disciplinary
- (d) All of the above

[Turn over

(ii) An operation research technique which is used to find solution of decision making problem by designing, constructing and manipulating a model of the real system is called –

- (a) Simulation
- (b) Replacement model
- (c) Decision theory
- (d) Search theory

(iii) A feasible solution to a linear programming problem

- (a) must be a corner point of the feasible region
- (b) must satisfy all the constraints of the problem simultaneously
- (c) must optimize the value of the objective function
- (d) need not satisfy all the constraints of the problem

(iv) In a linear programming problem

‘Maximize $z = 2x_1 + 5x_3$ ’ as example is called as

- (a) Objective function
- (b) Subjective function
- (c) Feasible function
- (d) Constraints

(v) The solution of a transportation problem with m-sources and n-destinations is feasible if the numbers of allocations are

- (a) $m+n+1$
- (b) $m+n-1$
- (c) $m-n-1$
- (d) $m+n-1$

(vi) In marking zero assignments, which of the following should be preferred ?

- (a) Only row having single zero
- (b) Only column having single zero
- (c) Only row or column having single zero
- (d) Column or row having more than one zero

(vii) MS-Word is an example of

- (a) an operating system
- (b) application software
- (c) a processing device
- (d) an input device

(viii) Computer is applicable in which of the following business related-work ?

- (a) Storing
- (b) Accounting
- (c) Searching customer
- (d) All of the above.

2. Answer the following questions : $4 \times 4 = 16$

- (a) Briefly explain the various models applicable in operation research work.
- (b) Explain in brief, any four importance of linear programming in various fields.
- (c) Define transportation problem. Distinguish between balance transportation problems and unbalance transportation problems.

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(d) Explain in brief, any four applications of computer in the field of business.

3. Explain the significance of operation research in solving the problems of modern business and industry. 14

Or

Discuss the types of operation research techniques available for various research work.

4. (i) Solve the following linear programming problem by graphical method : 6

$$\text{Maximize } Z = 2x_1 + 5x_2$$

$$\text{Subject to, } x_1 \leq 4$$

$$x_2 \leq 3$$

$$x_1 + 2x_2 \leq 8$$

$$\text{Where, } x_1, x_2 \geq 0.$$

- (ii) Bread and Butter are two products to be manufactured. Unit profits from each products are Rs. 40 and Rs. 35 respectively. Maximum material available for both the product is

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60 kgs and labour 96 hours. Each unit of Bread needs 2 kg of material and 4 man-hours, whereas each unit of Butter needs 3 kg of material and 3 man-hours.

Construct a linear programming model from the above information and solve it by graphical method. $2+6=8$

Or

Describe briefly the various necessary steps of formulating simplex algorithm. 14

5. (i) State the procedures of solving transportation problem by Least Cost Method. 6
- (ii) Solve the following transportation problem by Vogel's Approximation Method: 8

Destinations

To/ From	Dhubri	Goalpara	Bongaigaon	Supply
S_1	60	40	10	500
S_2	30	80	70	400
S_3	40	40	20	700
Demand	300	900	400	

Or

A tourist company has one car at each of five depots P, Q, R, S and T. A passenger requires a car in each city namely A, B, C, D and E. Distance in kms between depots and cities are given in the following distance matrix :

Cities	Depots				
	P	Q	R	S	T
A	160	130	175	190	200
B	135	120	130	160	175
C	140	110	155	170	185
D	50	50	80	80	110
E	55	35	70	80	105

Assigned the cars to passengers in such a way to minimize the distance travelled ? 14

6. Explain the advantages and disadvantages of e-commerce. State the future of e-commerce in a country like India. $5+5+4=14$

Or

What is meant by information system development? What are the processes of system development? Explain in brief, various system development methodologies. $2+4+8=14$