

2012

PM

Time : 3 hours

Full Marks : 80

Candidates are required to give their answers in their own words as far as practicable.

The questions are of equal value.

*Answer any **four** questions in which*

Q. No. 1 is compulsory.

1. Choose the correct answer of the following :
 - (a) A master production schedule contains information about :
 - (i) Quantities and required delivery dates of all sub-assemblies
 - (ii) Quantities and required delivery dates of final products
 - (iii) Inventory on hand for each sub-assembly
 - (iv) Inventory on hand for each final product

- (b) A Bill of materials lists the :
 - (i) Time needed to perform all phases of production
 - (ii) Production schedules for all products
 - (iii) Components, ingredients and materials required to produce an item
 - (iv) Operations required to produce an item
- (c) Operation research analysis do not :
 - (i) Predict future operations
 - (ii) Build more than one model
 - (iii) Collect relevant data
 - (iv) Recommend decision and accept
- (d) Constraints in a LP problem represents :
 - (i) Limitations
 - (ii) Balancing requirement and limitations
 - (iii) Requirements
 - (iv) All of the above
- (e) To formulate a problem for solution by simplex method, we must add Artificial variable to :
 - (i) Only equally constraints

- (ii) Only greater than constraints
 - (iii) Both (i) and (ii)
 - (iv) None of the above
- (f) The initial solution of transportation problem can be obtained by applying any known method. However, the only condition is that :
- (i) The solution be optimal
 - (ii) The rim condition are satisfied
 - (iii) The solution not be degenerate
 - (iv) All of the above
- (g) Operation Research approach is :
- (i) Multi disciplinary
 - (ii) Scientific
 - (iii) Intuitive
 - (iv) All of the above
- (h) The mathematical model of a LP problem is important because :
- (i) It helps in converting the verbal description and numerical data into mathematical expression

- (ii) Decision-makers prefer to work with formal models
- (iii) It captures the relevant relationship among decision factors
- (iv) It enables the use of algebraic technique
- (i) Managerial decision are based on :
 - (i) An evaluation of quantitative data
 - (ii) The use of qualitative factors
 - (iii) Numbers produced by formal models
 - (iv) All of the above
- (j) In job shop (make-to-order) operations, the master production schedule is usually expressed in terms of :
 - (i) End items
 - (ii) Modules
 - (iii) Kits
 - (iv) Customer orders

2. Discuss the importance of Production Management and Project Management.

3. Compare and contrast CPM and PERT. Under what conditions would you recommend scheduling by PERT? Justify your answer with reasons.
4. What is Linear Programming (LP)? What are its major assumptions and limitations?
5. A petroleum company has two units A1 and B1 which produce three different grades of oil super fine, medium and low grade oil. The company has to supply 12, 8, 24 barrels of super fine, medium and low grade oils respectively per week. It costs the company Rs. 1,000 and Rs. 800 per day to run the units A1 and B1 respectively. On a day unit A1 produces 6, 2 and 4 barrels and the unit B1 produces 2, 2 and 12 barrels of super fine, medium and low grade oil per day. The manager has to decide on how many days per week should each unit be operated in order to meet the requirement of minimum cost. Formulate the LPP model.
6. The annual requirement for a product is 3,000 units. The ordering cost is Rs. 100 per order. The cost per unit is Rs. 10. The carrying cost per unit, per year is 30% of the unit cost.

Find Economic Order Quantity (EOQ), by using better organizational method, the ordering cost per order on be brought down to Rs. 80 per order, but the same quantity as determined above has to be ordered if a new EOQ is found by using the ordering cost as Rs. 80, what would be further saving in costs.

7. Maximize $Z = 100X_1 + 40X_2$

subject to

$$10X_1 + 4X_2 \leq 2000$$

$$3X_1 + 2X_2 \leq 900$$

$$6X_1 + 12X_2 \leq 3000$$

and $X_1, X_2 \geq 0$

8. Write notes on the following :

(a) Economic Order Quantity (EOQ)

(b) Objectives of Statistics Quality Control (SQC)

