

**Paper 9 – Operation Management  
& Strategic Management**

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Full Marks: 100

Time allowed: 3 hours

**Section – A**

**I. Answer all:**

**1. Choosing of correct answers:**

**[10×1=10]**

(i) The desired objectives of Production and Operations Management is :

- (A) Use cheap machinery to produce;
- (B) To train unskilled workers to manufacture goods perfectly;
- (C) Optimal utilization of available resources;
- (D) To earn good profits.

(ii) The scope of Production Planning and Control is:

- (A) Limited to production of products only;
- (B) Limited to production of services only;
- (C) Limited to production of services and products only;
- (D) Unlimited, can be applied to any type of activity.

(iii) Manufacturing system often produces:

- (A) Standardised products;
- (B) Standardised products in large volumes;
- (C) Substandard products in large volumes;
- (D) products and services in limited volume.

(iv) The lead-time is the time:

- (A) To placeholders for materials;
- (B) Time of receiving materials;
- (C) Time between receipt of material and using materials;
- (D) Time between placing the order and receiving the materials.

(v) The first stage in production planning is:

- (A) Process Planning;
- (B) Factory Planning;
- (C) Operation Planning;
- (D) Layout Planning.

(vi) When work centers are used in optimal sequence to do the jobs, we can:

- (A) Minimise the set up time;
- (B) Minimise operation time;
- (C) Minimise the breakdown of machines;
- (D) Minimise the utility of facility.

(vii) 'Z' chart is a chart used in:

- (A) Programme control;
- (B) Job control;
- (C) Cost control;
- (D) Quality control.

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(viii) Most suitable layout for Job production is:

- (A) Line Layout;
- (B) Matrix Layout;
- (C) Process Layout;
- (D) Product Layout.

(ix) Most suitable layout for Continuous production is:

- (A) Line Layout,
- (B) Process Layout,
- (C) Group technology,
- (D) Matrix Layout.

(x) MRP stands for:

- (A) Material Requirement Planning,
- (B) Material Reordering Planning,
- (C) Material Requisition Procedure,
- (D) Material Recording Procedure.

**2. Put an appropriate word or two in blank position:**

**[2×1=2]**

- (a) To evaluate the work done by preventing maintenance, \_\_\_\_\_ is derived at from the total time of stoppage of the machine for schedules and unscheduled maintenance work.
- (b) In linear programming, the word 'linear' establishes certain relationships among different \_\_\_\_\_.

**3. Examine each statement and indicate whether it is True or False:**

**[7×1=7]**

- (i) In general, long-range forecasting is more useful in production planning.
- (ii) A work stoppage generally reduces the cost of production.
- (iii) There is limit beyond which labour productivity cannot be improved.
- (iv) When demand does not exist in the market, we should start production Incentives.
- (v) Breakdown maintenance doesn't require use of standby machines.
- (vi) Activity Sampling is not a technique of Job Evaluation.
- (vii) A good plant layout is one of the factors in effective utilization of labour.

**II. Answer any three:**

**4. (a)** What are the characteristic of a good plant layout?

**(b)** Company A wants to make large giant trucks called LARJO. Company A now requests you to list out the plant layout principles it should consider before taking any decision?

**(c)** What are the factors that force an organization to redesign plant layout?

**(d)** A Shaft 1200 mm in length is being machined on a lathe. If spindle rotates 600 r.p.m. and feed is 0.25 mm per revolution, how long will it take the cutter to pass down the entire length of shaft?  
**[5+4+5+3=17]**

**5. (a)** A company produces three products P, Q and R from three raw materials A, B and C. One units of product P requires 2 units of A and 3 units of B. One unit of product Q requires 2 units of B and 5 units of C and one unit of product R requires 3 units of A, 2 units of B and 4 units of C. The company has 8 units of material A, 10 units of material B and 15 units of material C available to it. Profits per unit of products P, Q and R are ₹3, ₹5 and ₹4 respectively.

Formulate the question mathematically to maximize the profit.

**[8]**

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(b) The following table gives the running costs per year and resale values of a certain equipment whose purchase price is ₹65,00. At what year is the replacement due optimally:- [9]

Year	1	2	3	4	5	6	7	8
Running cost (₹)	1400	1500	1700	2000	2400	2800	3300	3900
Resale value (₹)	4000	3000	2200	1700	1300	1000	1000	1000

6. (a) Manufacture of a component requires operations to be performed on three machines P, Q and R respectively, the standard times and operator efficiency being as follows:

Machine	Standard hours per component	Operator efficiency
P	0.16	80%
Q	0.23	100%
R	0.09	90%

If the factory operates 2 shift of 8 hours each and the machines are available for production throughout the shifts on six days in a week, how many of machines P, Q and R will be required to produce 4800 components per week? [6]

(b) Alternative methods X and Y using different tooling setups may be employed to manufacture a component on a particular machine tool whose operating cost (including wages of operator) is ₹20 per hour.

Component	Method X	Method Y
Cost of tooling	4000 pieces	3000 pieces
Production rate per hour	10 pieces	15 pieces

Justify with suitable calculation which of the two methods would you choose as being more economical for regular production.

Would your answer be the same if only 1000 pieces of the particular component are required? Give appropriate calculation to justify your answer. [8]

(c) A company purchases a key raw material of 3000 kg. a year at the rate of ₹10 per kg. It wishes to make its purchases on an optimum basis. The inventory carrying charges of 50 paise per kg. per year is based on average inventory. The company estimates that it costs ₹106 to place an order. What is the economic order quantity and how often the company should order? How will the policy change, if the supplier offers 10 per cent discount for orders of 1000 kg. or more? [3]

7. (a) A company has two plants A and B with fixed costs of ₹50,000 and ₹70,000 respectively. Both the plants are designed to produce up to 10,000 units each. The variable costs of two plants at different of production are as follows:

Production (Units)	Plant A (₹)	Plant B (₹)
2,500	36,000	29,000
5,000	45,000	39,000
7,500	77,000	51,000
10,000	1,10,000	1,15,000

Find the most economic loading schedule. [5]

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- (b) A trader delays in a perishable commodity, the daily demand and supply of which are random variables.

Records of the past 500 trading days show the following:

Supply		Demand	
Tons available	Number of days	Tons demanded	Number of days
10	40	10	50
20	50	20	110
30	190	30	200
40	150	40	100
50	70	50	40

The trader buys the commodity at ₹20 per kg. and sells at ₹30 per kg. If any of the commodity remains at the end of the days it has no saleable value. The loss through unsatisfied demand is ₹80 per kg.

Given the following random numbers, simulate six day trading:

3 1 1 8 6 3 8 4 1 5 7 9 0 7 3 2 4 3 7 5 8 1 2 7

Use the random numbers alternatively, i.e., first pair (31) to simulate supply, second pair (18) to simulate demand. [10]

- (c) What does product design do? [2]

**8. Write a short note:** [4+4+4+5=17]

- (a) Time Study;
- (b) Work Study;
- (c) Method Study;
- (d) Factors affecting business forecast.

### Section – B

**III. Answer all:** [6×1=6]

**9. Choosing of correct answers:**

- (i) Board of directors has certain basic tasks as follows:
  - (A) To define the corporate mission and stop irregular practice;
  - (B) To design the course of strategic options and appointment of top management;
  - (C) To set the ROI and other business performance targets;
  - (D) To monitor plan and keep abreast of external threats;
  - (E) To evaluate and monitor courses of actions.
  
- (ii) SAIL's famous advertising campaign of "there is a bit of steel in everyone's life" was meant to:
  - (A) gain buyers awareness about its versatile product range;
  - (B) create and image of superior performance;
  - (C) inform new buyers about its special products;
  - (D) enhance product quality perception;
  - (E) achieve its mission.

- (iii) Outsourcing is the
- (A) Spinning off of a value-creating activity to create a new firm;
  - (B) Selling of a value-creating activity to other firms;
  - (C) Purchase of a value-creating activity from an external supplier;
  - (D) Use of computers to obtain value-creating data from the internal.
- (iv) Successful 'differential strategy' allows a company to
- (A) Gain buyer loyalty to its brands;
  - (B) Charge too high a price premium;
  - (C) Have product quality that exceeds buyers' needs;
  - (D) Depend only on intrinsic product attributes.
- (v) For an actor in Bollywood, his outstanding performance would be a /an
- (A) Asset;
  - (B) Strategic Asset;
  - (C) Core competency;
  - (D) Capability.
- (vi) The strategy of the TATA group in India could be viewed as a good example of
- (A) Conglomerate diversification
  - (B) Market development
  - (C) Cost Leadership
  - (D) Concentric diversification.

**IV. Answer any three:**

**[8×3=24]**

10. (a) Discuss 'PEST' Analysis in relation to the Business environment.  
(b) Discuss the factors influencing Portfolio Strategy.  
(c) Discuss Mckinsey's 7 –S framework.  
(d) Write a note on Product Life Cycle.