ENGINEERING MANAGEMENT

Time : Three hours

Maximum Marks : 100

Answer FIVE *questions, taking* ANY TWO *from* **Group A** ,
ANY TWO *from* **Group B** *and* ALL *from* **Group C** .

*All parts of a question (a, b, etc.) should
be answered at one place.*

*Answer should be brief and to-the-point and be supplemented
with neat sketches. Unnecessary long answers may
result in loss of marks.*

*Any missing or wrong data may be assumed suitably giving
proper justification.*

Figures on the right-hand side margin indicate full marks .

Group A

1. (a) Describe the approach to the 'scientific management
   principle' of Taylor and discuss its limitations.   6 + 2

   (b) Briefly discuss what you understand by 'scalar and
   functional processes.' How are the chains of
   commands, obligations and reporting flow in these
   processes ?   4 + 2

   (c) Why does modern theory consider the organisation
   as a system consisting of interconnected parts ?
   Briefly discuss the components of the parts and their
   implications in modern organisation.   3 + 3

2. (a) What is the purpose of planning ? How is the planning process to be organised for achieving the purpose ? List three key activities in the planning process. 2 + 4 + 1

(b) Define SWOT analysis and discuss its importance in the setting of objectives and planning of strategies in an organisation. 3 + 7

(c) Critically discuss the statement, 'Delegation is neither decentralization nor are their purposes the same'. 3

3. (a) Describe the purpose of staffing. Discuss the factors to be incorporated in the staffing system. 2 + 4

(b) Elucidate the merits and limitations of trait-based and objective-based appraisal systems. 6

(c) Would linear programming be of help in a site selection problem ? Explain. 8

4. (a) Items purchased from a vendor cost Rs. 20 each, and the forecast for next year's demand is 1000 units. If it costs Rs. 5 every time an order is placed for more units and the storage cost is Rs. 4 per unit per year, what quantity should be ordered each time ?

(i) What is the total ordering cost for a year ?

(ii) What is the total storage cost for a year ? 2 + 2 + 2

(b) What kind of policy or procedure would you recommend to improve the inventory operation in a departmental store ? 5

(c) Discuss the importance of the master production schedule (MPS) in an MRP system. 5

(d) What is the role of safety stock in an MRP system ? 4

Group B

5. (a) Explain briefly the concept of financial management. State the important characteristics of financial management. 6 + 4

(b) Distinguish between the gross and net working capital concepts. Explain the classification of working capital. 5

(c) Discuss briefly the factors to be considered in deciding the dividend policy. 5

6. (a) What is a 'production function' in the context of managerial economics ? How many types of production function are there ? Indicate how, with the help of production function, the optimum combination of factor inputs can be obtained for a given level of total investment. 2 + 2 + 4

(b) What is the basic difference between short-run and long-run analysis in the context of theory of cost ? 2

(c) The total cost $C(x)$ of a firm is

$$C(x) = 0.005\ x^3 - 0.02\ x^2 - 30x + 5000$$

where x is the output. Determine:

(*i*) average cost (AC)

(*ii*) slope of AC

(*iii*) marginal cost (MC)

(*iv*) slope of MC

(*v*) value of x for which MVC = AVC

where VC represents the variable cost. Also, exhibit
the necessary diagrams. 10

7. (*a*) Discuss the aspects and importance of managing the
4 Ps of marketing with reference to environmental
issues. 10

(*b*) Identify the trends and challenges relating to quality
in the present context of global competitiveness. 6

(*c*) (*i*) Distinguish between p and c charts. 2

(*ii*) Distinguish between producer's risk and
consumer's risk in a sampling plan. 2

8. (*a*) 'Enterprise resource planning (ERP) is a business
solution.' Justify the statement. 4

(*b*) A project has been defined to contain the following
list of activities, along with their required times for
completion:

Activity	Time (days)	Immediate Predecessors
A	1	—
B	4	A
C	3	A
D	7	A
E	6	B
F	2	C, D
G	7	E, F
H	9	D
I	4	G, H

(*i*) Draw the critical path diagram;

(*ii*) Show the early start and early finish times;

(*iii*) Show the critical path; and

(*iv*) What would happen it activity F was revised to
take four days instead of two? 2 + 2 + 2 + 4

(*c*) A firm is considering two alternative investments.
The first investment costs Rs. 30000 and the
second investment Rs. 50000. The expected yearly
cash income streams are shown in the following
table:

Year	Cash Inflow, Rs.	
	Alternative A	Alternative B
1	10000	15000
2	10000	15000
3	10000	15000
4	10000	15000
5	10000	15000

To choose between alternatives *A* and *B*, find which alternative has the highest net present value. Assume an 8 per cent cost of capital.　　　　6

Group C

9. Write the *correct* answer for the following:　　2 x 10

(*i*) In a PERT network, expected time estimate (t_e) is calculated as

$$t_e = \frac{a + 4m + b}{6}$$

based on the assumption of

(*a*) normal distribution of time estimates

(*b*) exponential distribution of time estimates

(*c*) beta distribution of time estimates

(*d*) gama distribution of time estimates.

(*ii*) Regardless of approach used, the key element necessary in determining the level of safety stock which should be carried is the

(*a*) demand for items being inventoried

(*b*) length of lead time

(*c*) lead time demand for items

(*d*) cost of stockout per unit of time.

(*iii*) Taylor's philosophy of scientific management pays attention to

(*a*) convert inputs to desired outputs

(*b*) plan appropriate manpower

(*c*) time management

(*d*) develop a scientific method for each element of work so as to replace rule of thump.

(*iv*) Functional organisation was developed by

(*a*) Frank Gilbreth

(*b*) F. W. Taylor

(*c*) ASME

(*d*) Gantt.

(*v*) The time elapsed between the placing of an order and its arrival is

(*a*) cycle time

(*b*) lead time

(*c*) work station process time

(*d*) None of the above.

(*vi*) Function of finance includes

(*a*) investment decision

(*b*) wage and incentive distribution

(*c*) sales distribution

(*d*) costing the products.

(*vii*) Economic order quantity is influenced too much by

(*a*) lead time

(b) inventory carrying cost

(c) variable demand rate

(d) production rate.

(*viii*) Manufacturing a number of identical parts or products in lots either to meet a specific order or to meet continuous demand is known as

(a) job production

(b) batch production

(c) continuous production

(d) flow production.

(*ix*) The elasticity of total cost of the function, $C = 2x^2 + 4x + 3$, is

(a) $(4x^2 + 4x) / (2x^2 + 4x + 3)$

(b) $(2x^2 + 4x + 3) / (4x^2 + 4x)$

(c) $(4x^2 + 4x)(2x^2 + 4x + 3)$

(d) None of the above.

(*x*) At break-even point,

(a) total cost > total revenue

(b) total cost < total revenue

(c) total cost = total revenue

(d) None of the above.