S'14 : 3 FN : IC 402 (1411)

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*) Identify four different approaches to management and
    then define the term 'management'.   7

    (*b*) Describe various functions of management.   8

    (*c*) What do you understand by 'authority' and
    'responsibility' ?   5

2. (*a*) Explain various types of organisation in brief.   10

    (*b*) Describe contributions of some pioneers/leaders to
    'human relation approach'.   10

3   (*a*) Discuss how site of a factory would influence the
    production cost.   5

(*b*) State the relative merits and demerits of various types of plant layout.   10

(*c*) State the objectives of maintenance.   5

4. (*a*) Explain ABC system in inventory control with the help of a neat diagram.   12

(*b*) A company requires 16000 units of raw material costing Rs. 2 per unit. The cost of placing an order is Rs. 45 and the carrying costs are 10 % per year per unit of average inventory. Determine the (*i*) economic order quality and (*ii*) cycle time.   4 + 4

Group B

5. (*a*) What are the heads of expenditure that may be incurred for ERP implementation ?   7

(*b*) Explain in brief different financial ratios.   7

(*c*) What is imprest ? How is it maintained ?   2 + 4

6. (*a*) Explain in detail about factors of production.   12

(*b*) What is market research and analysis ? Explain how it is conducted .   2 + 6

7. (*a*) Describe in brief various types of control charts and their applications.   8 + 4

(*b*) Differentiate between PERT and CPM.   8

8. (*a*) Discuss the role of EDI in e-commerce. Give some examples.   8

(*b*) Explain the role of management information system (MIS) and decision support system (DSS) in today's industrial management.   6 + 6

Group C

9. Answer the following in brief :   10 × 2

    (*i*) Participative management

    (*ii*) MPS

    (*iii*) Inventory control

    (*iv*) Learning curve

    (*v*) Marginal productivity

    (*vi*) Dummy activity

    (*vii*) CRAFT

    (*viii*) Maintenance

    (*ix*) Project management

    (*x*) Acceptance sampling.

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· S'05 : 3 FN : IC 402 (11)   RS

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.*

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proper justification.*

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

Group A

1. (a) Discuss the functions of a manager.   3

   (b) How is decision making in scientific management different from decision making in traditional management ?   3

   (c) What criteria would you suggest for evaluating the effectiveness of a management team ?   6

   (d) What are the methods of management control ? Explain each of them in brief.   8

(*Turn Over*)

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3

2. (*a*) What are the mechanics of an ogranisation ? How are these effective to achieve the objective of an organisation ?   10

(*b*) How would you undertake the reorganisation of an enterprise ?   5

(*c*) What principles would you use as guides ?   5

3. (*a*) Discuss the importance of plant location.   5

(*b*) How are plant location and plant layout decisions related ?   5

(*c*) Outline and explain the factors to be considered for plant layout development.   10

4. (*a*) Put yourself in the position of a training director, who must justify his work to top management. How would you go about projecting that you are an asset to the firm ?   10

(*b*) Explain in brief two important techniques of work study.   10

Group B

5. (*a*) Contrast independent and dependent demand with respect to inventories.   8

(*b*) A producer distributes 800 packing boxes per month, which he purchased at a cost of Rs.10 each. The manager has assigned an annual carrying charge of 25 per cent of the purchase price per box. Ordering costs are Rs.28. Currently the manager orders once a month. How much could the firm save annually in ordering and carrying costs using the EOQ ? Derive the formulae you use from the first principles.   12

6. (*a*) Outline the important steps involved in project management.   10

(*b*) The time required to complete each of eight jobs on two machines are shown in the table below. Each job must follow the same sequence, beginning with machine *A* and moving to machine *B*.

Determine the optimum sequence, and show the resultant sequence on a time chart and find the idle time for *B*.   10

Time in hours

Job	Machine A	Machine B
1	16	5
2	3	13
3	9	6
4	8	7
5	2	14
6	12	4
7	18	14
8	20	11

7. (*a*) What are the concepts that underline the construction and use of control charts ?   10

(*b*) What factors govern the choice of single versus multiple sampling plans ?   10

8. (*a*) What are the important aspects to be considered for a project within the scope of project control ?   8

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(*b*) A company builds luxury boats to customer order. Relevant data are given below. The customer wants delivery in 32 weeks failing which he will impose a penalty of Rs.3750 for each week his boat is late.

Activity	Precedes	Normal Time, weeks	Crashing Costs, Rs. 1st Week	2nd Week
K	L, N	9	4100	4150
L	M	7	1250	—
N	J	5	450	450
M	Q	4	3000	3500
J	Q	6	500	—
Q	P, Y	5	2000	2250
P	Z	8	—	—
Y	end	7	850	900
Z	end	6	900	—

Develop a crashing schedule.   12

Group C

9. Answer very briefly the following: 2 x 10

(*i*) What are the important differences between manufacturing and service operations?

(*ii*) Outline the steps in the decision making process.

(*iii*) What are the optimum values of x and y for the following:

Maximize $Z = 10x + 20y$
subject to $5x + 2y \leq 40$
$4x + 4y \leq 48$
$x,\ y \geq 0$

(*iv*) Explain the difference between MAD and MSE as used in forecasting.

(*v*) What are the basic assumptions of Breakeven Analysis?

(*vi*) What are the advantages of a product layout?

(*vii*) How is job enlargement different from job enrichment?

(*viii*) How is MRP different from MRP II?

(*ix*) What are the differences between predictive maintenance and preventive maintenance?

(*x*) Differentiate between quality and reliability.

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RS

W'05 : 3 FN : IC 402 (1411)

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.**

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answered at one place.*

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

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giving proper justification.*

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

Group A

1. (*a*) Define management. What are the objectives of
management ?   6

   (*b*) Consider yourself a manager of a firm that has
   recently identified the need of a new consumer pro-
   duct in the market. Identify the different steps that
   you would undertake so as to successfully develop
   the product.   8

   (*c*) What do you mean by scientific management ? Will
   you prescribe it for today's organisations ? If not,
   why ?   6

2. (a) Compare and contrast between a line organization and a matrix organisation. Also identify the kind of firms where such organizational structures would be most suitable. 　　8

(b) What are the considerations in the design of an organizational structure for a company? Discuss them. 　　6

(c) What do you mean by participative management? Bring out its advantages and disadvantages. 　　6

3. (a) Why is it necessary to store an item in inventory? What are the objectives of an inventory control system? 　　8

(b) The annual demand of a product is 24,000 units. The buying cost per order is Rs. 100 and the estimated cost of carrying one unit in stock for a month is 2%. The normal price of the product is Rs. 10 per unit. However, the supplier offers a discount of 7·5% for an order of at least 3000 units and a discount of 12·5% if an order is for at least 5000 units.
Find the most economic purchase quantity per year. 　　12

4. Write short notes on: 　　5 × 4

(i) Systems Management

(ii) Collective Bargaining

(iii) Human Resource Skill Development

(iv) Strategies for Effective Maintenance.

Group B

5. (a) Describe the following important components of a balance sheet giving suitable examples: (i) Current Assets, (ii) Fixed Assets, (iii) Current Liabilities, (iv) Fixed Liabilities. 　　8

(b) How are inventories considered in a balance sheet— assets or liabilities? Discuss why. 　　6

(c) Show a representative Profit and Loss Statement of a company of your choice. Use hypothetical figures. 　　6

6. (a) Give at least two definitions of quality in the context of a product. Which definition would you prefer and why? 　　6

(b) What are the objectives of quality control? 　　4

(c) Explain, in brief, the X-bar and R charts used for quality control. 　　6

(d) What is acceptance sampling? 　　4

7. The data for a simple construction project are as given below:

Activity	Immediate Processor(s)	Time (Days)		Direct Cost (Rs.)	
		Normal	Crash	Normal	Crash
A	—	4	3	60	90
B	—	6	4	150	250
C	—	2	1	38	60
D	A	5	3	150	250
E	C	2	2	100	100
F	A	7	5	115	175
G	D, B, E	4	2	100	240

Indirect costs are Rs. 40 per day.

(*a*) Draw an arrow diagram for the project.   3

(*b*) Find all the paths in the project along with their normal and crash times.   3

(*c*) Find the crashing costs for each activity on a per day basis.   4

(*d*) Determine the project duration that will return the minimum total project cost by appropriately crashing the project.   10

8. (*a*) What are the different types of information systems ? Identify each of them with an appropriate level of management.   8

(*b*) What are the characteristics of e-business applications ? Discuss them with reference to an e-business application of your choice.   6

(*c*) What do you mean by enterprise resource planning (ERP) ? What are its component subsystems ?   6

Group C

9. Answer the following questions very briefly :   2 × 10

(*i*)   Name five important functions of management.

(*ii*)   Why is line organization not suitable for today's organizations ?

(*iii*)   What are some considerations in making site selection decisions in locating a plant ?

(*iv*)   How will you estimate carrying or holding costs of storing an item in inventory ?

(*v*)   What inputs will you use in preparing master production schedule for a MRP system ?

(*vi*)   What is Inventory Turnover Ratio ?

(*vii*)   What is a *p*-chart used for quality control ?

(*viii*)   What is the largest path in a project network diagram ? What is its significance ?

(*ix*)   Give a definition of information.

(*x*)   Name some popular Enterprise Resource Planning (ERP) Software.

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S'06 : 3 FN : IC 402 (1411)

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.*

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proper justification.*

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

Group A

1. (a) Outline the fundamental elements of a planning
    system.   2

    (b) Identify and briefly discuss the planning situations
    associated with the use of a conversion system.   8

    (c) Explain how the four C's model can be used to
    evaluate an organization's human resource
    management programme ?   10

(Turn Over)

2. (a) Elucidate the sequence of activities for exercising managerial control in organization.   6

(b) Define the directing function of management.   2

(c) Distinguish between :   6

(i) Upward and Downward communication

(ii) Cooperation and Coordination.

(d) What is meant by collective bargaining? Why is it referred to as a two way process?   6

3. (a) Explain Brown and Gibson model (1972) of plant location with a suitable example.   10

(b) How are the organizational goals related to the organizational plans?   3

(c) Show the hierarchy of objectives for a manufacturing organization.   7

4. (a) What relationship exists between the layout and location decisions?   4

(b) Explain the essential feature of CRAFT, a computerized layout model.   4

(c) Explain Total Productive Maintenance (TPM) with example.   7

(d) What is bathtub curve? Explain.   5

Group B

5. (a) A project schedule has the following characterisitcs :

Activity	Time	Activity	Time
1-2	4	5-6	4
1-3	1	5-7	8
2-4	1	6-8	1
3-4	1	7-8	2
3-5	6	8-10	5
4-9	5	9-10	7

(i) Construct a network diagram.   4

(ii) Determine critical path and total project duration.   4

(b) Location A would result in annual fixed cost of Rs. 3 00 000 variable costs of Rs. 63/unit, and revenues of Rs. 68 /unit. Annual fixed cost at location B are Rs, 8 00 000, with variable costs of Rs. 32/unit and revenue of Rs. 68 /unit. Sales volume is estimated to be 25,000 units/ year. Which location is more attractive?   6

(c) Differentiate between PERT and CPM with respect to their use, advantages, and disadvantages.   6

6. (a) Distinguish among funds, working capital, net working capital, and income.   6

(b) Differentiate between the current ratio and acid test.   5

(c) Why is it possible for a firm to have high profits but still be unable to pay its bill when they are due ?   3

(d) Why do financial managers use a variety of measures of profits for firms ?   6

7. (a) Explain the concept of managerial economics stating the important characteristics and major applications.   5

(b) State and explain the laws of variable proportion or the law of diminishing return, giving the important assumptions.   5

(c) Distinguish between data and information. Identify the various steps for converting data into information.   4

(d) Mention the importance of management information system for an organization. State the requirements of an effective MIS.   6

8. (a) Outline the trends and challenges relating to quality in the present context of global competitiveness.   3

(b) Explain briefly the concept of total control and total quality management (TQM).   3

(c) Explain the following :   9

(i) Pay back period

(ii) Net Present Value (NPV)

(iii) Internal Rate of Return (IRR).

(d) Elucidate the principles of marketing management with examples.   5

Group C

9. Answer the following questions very briefly :   2 x 10

(i) What do you mean by scientific management ? Who originated it ?

(ii) What is participative management ? Why is it being practiced ?

(iii) Differentiate between continuous review and periodic review inventory models.

(iv) What are the inputs to materials requirement planning (MRP) ? Name them.

(v) How does the balance sheet show the source of resources for a firm ?

(vi) The inventory of a company is Rs. 2·2 lacs, the current assets are Rs. 8 lacs and the current liabilities are Rs. 4 lacs. Determine the inventory to working capital ratio.

(vii) A company has long-term debt of Rs. 5 lacs. The owners equity amount is Rs. 7·5 lacs. Determine the debt equity ratio.

(*viii*) What is a Decision Support System (DSS) ? Who should use them ?

(*ix*) What do you mean by Enterprise Resource Planning (ERP) ?

(*x*) What is Acceptance Sampling ? Why should it be used ?

W'06 : 3 FN : IC 402 (1411)

ENGINEERING MANAGEMENT

Time : Three hours

Maximum Marks : 100

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proper justification.*

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

Group A

1. (a) Discuss the contributions of F W Taylor.   10

    (b) Indicate why the different management functions
    one of greater importance at different levels of an
    organization.   10

2. (a) How is a formal organization different from an
    informal one ?   8

    (b) Explain, with suitable examples, the important
    principles used in developing an organization.   12

3. (*a*) Explain the role of a personnel manager.   10

(*b*) Discuss the characteristics of various incentive schemes.   10

4. (*a*) Describe the factors which affect the location choices, both for manufacturing and services.   8

(*b*) Describe the basic types of layout and indicate when each is best used.   12

Group B

5. (*a*) Describe the purpose of accounting in a business organization.   10

(*b*) What are the financial statements and how they are used to give a financial picture of business?   10

6. (*a*) Explain the different elements of 'marketing mix'.   12

(*b*) Justify the role of research in marketing. Give examples in support of your answer.   8

7. Describe the fundamental role of computers and information technology in reshaping an organizations. Give suitable examples in operations, finance, marketing and personnel management areas.   20

8. A company has received an order from a good customer for a specially designed electric unit. The contract states that starting on the thirteenth day from now, the firm will experience a penalty of Rs. 100 per day until the job is completed. Indirect project costs amount to Rs. 200 per day. The data on direct costs and activity precedence relationships are given in the table below.

Table : Electric Unit Project Data

Activity	Normal Time (days)	Normal Cost (Rs.)	Crash Time (days)	Crash Cost (Rs.)	Immediate Predecessor(s)
A	4	1000	3	1300	—
B	7	1400	4	2000	—
C	5	2000	4	2700	—
D	6	1200	5	1400	A
E	3	900	2	1100	B
F	11	2500	6	3750	C
G	4	800	3	1450	D, E
H	3	300	1	500	F, G

(*a*) Draw the project network diagram.   4

(*b*) What completion date would you recommend.   16

Group C

9. Explain very briefly the differences between the following with examples :   2 x 10

(*i*) Planning and organizing.

(*ii*) Accountability and Responsibility.

(*iii*) Job Enlargement and Job Enrichment.

(*iv*) Diversification and Simplification of product lines.

(*v*) Industrial goods and Consumer goods.

(*vi*) Current Ratio and Liquidity Ratio.

(*vii*) Data Processing and Word Processing.

(*viii*) Push system and Pull system.

(*ix*) Dependent Demand and Independent Demand.

(*x*) Quality and Reliability.

S'07 : 3 FN : IC 402 (1411)

ENGINEERING MANAGEMENT

Time : Three hours

Maximum Marks : 100

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result in loss of marks.*

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proper justification.*

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

Group A

1. (a) Explain the classic three-fold concept for management as proposed by Harbison and Myers.   6

   (b) What are the different functions of management? Briefly explain the roles of managers as per Mintzberg's findings.   2 + 6

   (c) Classify organizations by the nature of authority? Explain one of them.   2 + 4

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2. (a) Define leadership and motivation. Explain Herzberg's two-factor model of motivation.   3 + 7

   (b) How do forecasting and decision-tree techniques help in planning and decision making in an organization?   5 + 5

3. (a) Why is the facility location decision important to an organization? What factors do affect the choice of locations in manufacturing? How do the location decisions for service facilities differ from that of manufacturing facilities?   4 + 4 + 4

   (b) What is layout planning? Based on the firm's flow strategy, how many basic types of layout are possible? How do you design for a process layout?   2 + 2 + 4

4. (a) What is the purpose of materials management? What factors do contribute significantly in material requirement planning and how?   2 + 7

   (b) What are the costs for holding inventories? What types of inventories does a business own?   2 + 3

   (c) Perform *ABC* analysis using the following data: 6

Item	Units	Unit Price (Rs.)
1	700	5.00
2	2400	3.00
3	150	10.00
4	60	22.00
5	3800	1.50
6	4000	0.50

Item	Units	Unit Price (Rs.)
7	6000	0.20
8	300	3.50
9	30	8.00
10	2900	0.40
11	1150	7.10
12	410	6.20

Group B

5. (a) Present the account form as well as report form of a balance-sheet.   4

   (b) What is investment analysis? Why is it of great importance to a firm? Discuss a method of evaluating investment proposals.   2 + 3 + 5

   (c) What is the present value of the following cash stream, if the discount rate is 14 per cent?   6

Year	0	1	2	3	4
Cash flow	5000	6000	8000	9000	8000

6. (a) Define quality. What are the costs of poor quality?   2 + 3

   (b) What are the five pillars of total quality management? Define Deming's PDCA cycle. Explain Juran's trilogy.   1 + 3 + 3

3FN:IC 402 (1411)   (3)   (*Turn Over*)

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(c) Define assignable causes and common causes of variation. The *ABC* company produces incandescent light bulbs. Following data on the number of lumens for 40 W light bulbs were collected when the process was in control:

Sample	Observations	
	1	2
1	600	610
2	590	600
3	580	570
4	620	600
5	570	620

Construct $\bar{x}$ chart [the value of A_2 for $n = 2$ is 1.88].

3 + 5

7. (a) What is product development? Why is product development a critical determinant of an organization's success? Define product life cycle.   2 + 3 + 2

(b) Define marketing and marketing management. What are the key factors affecting pricing decision? Explain cost approach for pricing.   3 + 3 + 3

(c) A process costs Rs. 200·00 to set up. The run time is 5 min per piece and the run cost is Rs. 30·00 per hour. Determine the (i) fixed cost and variable cost; and (ii) total cost and unit cost for a lot of 500.   2 + 2

8. (a) Define project. What are the elements of a successful project? What tools are available for scheduling and controlling projects?   2 + 2 + 2

(b) Given the following network and activity times:
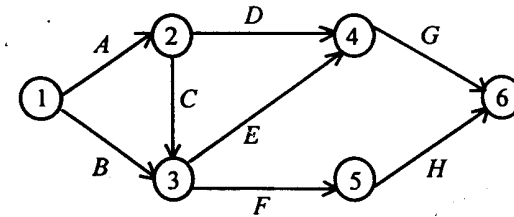
Activity	Optimistic Time	Most Likely Time	Pessimistic Time
A	6	7	14
B	8	10	12
C	2	3	4
D	6	7	8
E	5	5·5	9
F	5	7	9
G	4	6	8
H	2·5	3	3·5

(i) Calculate the expected time and variance for each activity.   7

(ii) What is the critical path?   2

(iii) How long will it take to complete this project?   1

(iv) What is the probability that the project will be completed within 25 days?   4

Group C

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

(*i*) The 'father of scientific management' is

  (*a*) F. W. Taylor

  (*b*) F. A. Gilbreth

  (*c*) M. L. Cooke

  (*d*) H. Emerson.

(*ii*) The 'classical management principles in terms of human factors' was proposed by

  (*a*) Elton Mayo

  (*b*) M. P. Follett

  (*c*) F. W. Taylor

  (*d*) Kurt Lewin.

(*iii*) Anthropology is one of the disciplinary bases for management, which deals with

  (*a*) measurement and analysis of physical factors in achieving efficiency

  (*b*) development of a sociotechnical model for employees' health and safety improvement

  (*c*) cultural variations and discoverable patterns of behaviour from history and environment

  (*d*) allocation of scarce resources with orientation to future.

(*iv*) The management function 'organizing' focuses on the

  (*a*) process by which the structure and allocation of jobs are determined

  (*b*) course of actions that can be chosen from available alternatives

  (*c*) process by which manager anticipates the future

  (*d*) process by which managers select, train, promote, and retire subordinates.

(*v*) The following is *not* a basic component of an inventory control system :

  (*a*) Planning what inventory to stock and how to acquire it

  (*b*) Forecasting the demand for parts and products

  (*c*) Organizing the internal inventory users and explain how they can help control inventory costs

  (*d*) Controlling inventory levels.

(*vi*) PERT never uses

  (*a*) activities with probabilistic times

  (*b*) dummy activities

  (*c*) activity variance estimates

  (*d*) None of the above.

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(*vii*) If the cost of manufacturing (direct material and direct labor) is 60% of sales and profit is 10% of sales, what would be the improvement in profit. If the cost of manufacturing is reduced from 60% to 50% keeping other expenses constant?

(*a*) 50%

(*b*) 200%

(*c*) 75%

(*d*) 100%.

(*viii*) A company requires 9000 units of a certain item annually. It costs Rs. 3·00 per unit. The cost per purchase order is Rs. 300·00 and the inventory carrying cost per unit per year is 20 per cent of the unit cost. The economic order quantity for the company is

(*a*) 4000 units

(*b*) 3500 units

(*c*) 3000 units

(*d*) 5000 units.

(*ix*) Benchmarking used to develop objectives by

(*a*) obtaining reports from the government

(*b*) using SMART objectives

(*c*) making comparisons with excellent or best-practice companies

(*d*) listening to suggestions from employees.

(*x*) Managers who displays Theory X behaviours are

(*a*) autocratic

(*b*) democratic

(*c*) participative

(*d*) situational.

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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.*

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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

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

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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: 2×10

(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.

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S'08 : 3 FN : IC 402 (1411)

ENGINEERING MANAGEMENT

Time : Three hours

Maximum Marks : 100

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Group A

1. (a) Briefly explain different aspects of management by
which it is conceived, evolved and implemented.   8

   (b) How are management functions integrated ? Explain
with an appropriate diagram.   7

   (c) Discuss the role of knowledge leadership and change
handler of a manager in an organisation.   5

2. (a) What are the processes of corporate planning?
Illustrate these processes in a neat sketch. Enumerate
the benefits of corporate planning in a manufacturing
company.   10

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(b) What do you understand by management control? Discuss *nine* methods of management control suggested by Arthur Bedeian.   10

3. (a) Explain the Sargant Florance's theory of industrial location. What are the factors affecting facility location?   10

(b) Discuss the facility location model given by Brown and Gibson. What are the important factors of facility location of a software company?   10

4. (a) With a neat sketch, discuss the systematic maintenance management system.   8

(b) An Engineering Consultant firm received an order from private industrial enterprise to study the total cost at the present maintenance policy for machinery in a decentralised section of its manufacturing plant. Data on machinery breakdown over a 16 h period is as follows :

Request for Repair (arrival time)	Total Repair Time Required (worker hours)
01·00	2·00
07·30	5·00
08·00	1·00
11·50	3·00
12·20	0·50

The company has two maintenance engineers and charges their time (working/idle) at Rs. 250 per hour each. The downtime cost of machines, from lost production, is estimated at Rs. 1200 per hour. Determine the (i) simulated service maintenance cost; (ii) simulated breakdown maintenance cost; and (iii) simulated total maintenance cost.   12

Group B

5. (a) Define balance sheet. Classify the asset and liability items for inclusion in the balance sheet. Explain the linkage of two successive balance sheets.   10

(b) What do you understand by funds flow statement? Give an example of funds flow statement.   10

6. (a) Discuss the concept of 'theory of the firm'. Explain profit maximization under perfect competition.   8

(b) If the total cost function of a firm is

$$C(x) = \frac{1}{3}x^3 - 5x^2 + 30x + 10$$

where C is the total cost and x, the output under perfect condition given as 6. At what values of x will the profit be maximized? Examine both first and second order conditions. Will the firm continue production?   12

7. (a) Define quality cost and explain why its management is useful. Classify cost of quality assurance and differentiate between each cost.   10

(b) Distinguish between quality control and quality assurance.   6

(c) Explain the term 'quality circle' with a neat diagram.   4

8. (a) Discuss the role of Internet in electronic commerce.   4

(b) Explain the various concepts of project management.   4

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(c) Consider a project, given the following activities and their time estimates :

Activity	Expected Time (days)	Activity	Expected Time (days)
1—2	4	5—6	4
1—3	1	5—7	8
2—4	1	6—8	1
3—4	1	7—8	2
3—5	6	8—10	5
4—9	5	9—10	7

(i) Draw the network ;   4

(ii) Identify the critical path for monitoring the project ; and   2

(iii) Calculate total float and free float for each activity.   6

Group C

). Define the following terms in 2 - 3 sentences :   2 x 10

(i) Training and development.

(ii) Hierarchy of human needs.

(iii) Trade Union.

(iv) Four C s of human resources management.

(v) Product/line layout.

(vi) Full form of CRAFT.

(vii) Breakdown maintenance index.

(viii) Value analysis.

(ix) 'Most likely time' in project management.

(x) Management information system (MIS).

ENGINEERING MANAGEMENT

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Group A

1. (a) What are the important functions of management?
    What is a management process?   10

    (b) Discuss different types of organizations. Which type
    of organization would be most suitable for a
    manufacturing company?   10

2. (a) Discuss why human resource management is
    important today in every organization. Briefly
    describe the role of recruitment and selection in this
    context.   8

(b) Bring out the difference between 'training' and 'retraining'.   6

(c) What is collective bargaining ? What is its role in human resource management ?   6

3. (a) What is scientific management ? What is its relevance in today's context ?   6

- (b) Bring out the contribution of the following persons in the context of management :   8

  (i) Frank and Lillian Gilbreth

  (ii) Henry L. Gantt.

(c) What is engineering management ?   6

4. (a) What do you mean by inventory ? Why is it required to manage inventory ?   6

(b) What is ABC analysis ? Discuss its procedural steps. Give appropriate figures to substantiate your answer.   8

(c) What is MRP ? Draw a schematic diagram to show the interrelation between MRP and the production planning and scheduling process.   6

Group B

5. (a) What are the different standard forms of financial statements ? Why are they used ?   6

(b) What are the different liabilities in a balance-sheet ? What is owner's equity ?   6

(c) According to the recent balance-sheet of ABC company, the following data are obtained :

Current assets   :   Rs.   5,00,000
Current liability :   Rs.   50,000
Sales   :   Rs.   1,00,000
Inventory   :   Rs.   50,000

Find the following for the company : (i) Current ratio ; (ii) Quick ratio ; and (iii) Inventory turnover ratio.   8

6. (a) What is the difference between quality assurance and quality control ?   6

(b) What is TQM ?   6

(c) What is acceptance sampling ? Explain with the help of suitable plots.   8

7. (a) Define project. Differentiate between project evaluation and review technique (PERT) and critical path method (CPM).   8

(b) A project consists of eight activities, the details of which are given below :   12

S. No.	Activity	Duration, days	Immediate Predecessor (s)
1	A	1	—
2	B	3	A
3	C	5	—
4	D	3	B, C
5	E	1	D
6	F	12	—
7	G	3	E, F
8	H	1	G

(*i*) Draw the project network diagram. Find the critical path and the project completion time.

(*ii*) If the activity, *F*, is now completed in 8 days only, what would be the critical path and the project completion time?

8. (*a*) Bring out the difference between management information system (MIS) and decision support system (DSS) in the context of an organization.   8

(*b*) What is e-business?   6

(*c*) Why is enterprise resource planning (ERP) needed?   6

Group C

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

(*i*) Strategic management is primarily carried out by

(*a*) top management

(*b*) middle management

(*c*) knowledge management

(*d*) operational management.

(*ii*) Scientific management was originally proposed by

(*a*) F. Gilbreth

(*b*) F. W. Taylor

(*c*) H. Gantt

(*d*) H. Simon.

(*iii*) Induction and orientation are part of the following human resource management function:

(*a*) Recruitment

(*b*) Training

(*c*) Retraining

(*d*) Skill development.

(*iv*) What kind of method may be used for solving line balancing problems of intermitted flow systems?

(*a*) Heuristic

(*b*) Linear Programming model

(*c*) Dynamic programming

(*d*) None of the above.

(*v*) A simple EOQ model consists of the following costs:

(*a*) Carrying and stockout

(*b*) Ordering and stockout

(*c*) Carrying and ordering

(*d*) Carrying and backorder.

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(*vi*) In a balance-sheet, bills receivable is a part of

    (*a*) current liabilities.

    (*b*) long-term liabilities.

    { *c*) fixed assets.

    { *d*) current assets.

(*vii*) A control chart that plots the fraction defective or % defective items from samples is a

    (*a*) X bar chart

    (*b*) R chart

    (*c*) p chart

    { *d*) C chart.

(*viii*) In PERT analysis, we usually take the following number of time estimates for every activity:

    (*a*) one

    (*b*) two

    (*c*) three

    (*d*) four.

(*ix*) In a project network, there could be following number of critical paths :

    (*a*) Zero

    (*b*) Exactly one

    (*c*) Exactly two

    (*d*) One or many.

(*x*) A decision support system usually supports this level of management :

    (*a*) Operational management

    (*b*) Knowledge level management

    (*c*) Middle level management

    (*d*) None of the above.

S'09: 3FN: IC402 (1411)

ENGINEERING MANAGEMENT

Time : Three hours

Maximum Marks : 100

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Group A

1. (*a*) Distinguish between management and administration.
   How far is this distinction justified in your opinion ?   10

   (*b*) 'Sound organisation structure is an essential prerequisite
   of efficient management.' Discuss this statement and
   point out various principles which should be followed
   in developing an organisation.   10

2. (*a*) Define management system (MS). Discuss its
   advantages and disadvantages briefly.   10

(*b*) Brief the contribution of F.W. Taylor towards scientific management.   4

(*c*) Differentiate between mission, goal and objective.   6

3.   (*a*) What are some selection processes / techniques that a manufacturing organisation should adopt ? Discuss.   10

   (*b*) Define and differentiate between industrial disputes, lockout and picketing.   10

4.   (*a*) What are Materials Requirement Planning and Manufacturing Resources Planning ?   8

   (*b*) Derive $Q = \sqrt{2U.P/C.P.}$, where Q is the economic lot size; C, the cost of carrying inventory in percentage per period; P, the procurement cost; and U, the total quantity used per period.   6

   (*c*) A factory uses two pieces per day of a rod, 6 mm in diameter and 150 mm long, in one of their manufacturing processes. The rod costs Rs. 3 each and the total expenses involved in purchasing and receiving them are Rs. 50 per order. The annual inventory carrying cost per item is Re. 1. The procurement period is three days and the minimum stock kept is 8 pieces. Find out the (*i*) standard ordering quantity, (*ii*) recorder point, and (*iii*) maximum stock.   6

Group B

5.   (*a*) Differentiate between debentures and shares.   6

   (*b*) What do you understand by trial balance. Explain with a suitable example.   6

(*c*) Calculate the selling price of one fountain pen from the data given below :   8

No. of fountain pens produced	135
Labour cost	Rs. 200
Material cost	Rs. 160
Factory overheads	35% of prime cost
Administration and sales overheads	35% of factory cost
Profit	10% of the total cost

6.   (*a*) What is quality circle (QC) ? What are its merits and demerits ?   8

   (*b*) What is inspection ? What is the basic difference between inspection and quality control ?   6

   (*c*) What do you mean by economic batch quantity ? Derive its formula.   6

7.   (*a*) Discuss the managerial use of total floats and free floats.   6

   (*b*) In which situation PERT technique is more suitable than CPM ? What is the technique more commonly used in India and why ? Discuss.   8

   (*c*) What do you mean by ISO standards ? Name *three* standards for different purposes.   6

8.   Write short notes on any *four* of the following :   5 × 4

   (*i*) Management as a science and as an art

   (*ii*) Necessity and advantages of good housekeeping

   (*iii*) ABC analysis

   (*iv*) Liability and asset

   (*v*) Learning phenomenon and factors on which this is dependent.

Group C

9. Choose the *correct* answer for the following :   2 × 10

(*i*) The founder of scientific management was

   (*a*) F.W. Taylor

   (*b*) F. Gilberth

   (*c*) H.Gantt

   (*d*) H. Simon.

(*ii*) Military organisation is known as

   (*a*) line organisation

   (*b*) line and staff organisation

   (*c*) fundamental organisation

   (*d*) matrix organisation.

(*iii*) PERT has the following time estimate(s) :

   (*a*) one time estimate

   (*b*) two time estimates

   (*c*) three time estimates

   (*d*) No time estimate.

(*iv*) Standing orders, which are statutory, are applicable to

   (*a*) all industries

   (*b*) all process industries

   (*c*) only major industries

   (*d*) all industries employing more than 100 workers.

(*v*) Break-even analysis shows profit when

   (*a*) sales revenue > fixed cost

   (*b*) sales revenue > variable cost

   (*c*) sales revenue > total cost

   (*d*) sales revenue = fixed cost.

(*vi*) The appellate authority for any industrial dispute is

   (*a*) management

   (*b*) labor court

   (*c*) high court or supreme court

   (*d*) board of directors.

(*vii*) Slack represents the difference between the

   (*a*) latest allowed time and the normal expected time

   (*b*) latest allowed time and the earliest expected time

   (*c*) proposed allowable time and the earliest expected time

   (*d*) project limitation time and actual starting project.

(*viii*) The method of classification of items to be adopted for spare part inventory is

   (*a*) ABC analysis

   (*b*) VED analysis

   (*c*) XYZ analysis

   (*d*) SDI analysis.

(*ix*) CPM is

   (*a*) critical process method

   (*b*) critical path method

   (*c*) common plan method

   (*d*) combined process method.

(*x*) All financial decisions on any project appraisal are based on the

   (*a*) future value of money

   (*b*) present value of money

   (*c*) opportunity cost of money

   (*d*) Any one of the above.

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Group A

1. (*a*) Why is planning considered to be the most important
         function of management ? Discuss different types of
         plans and at different levels of an organization.   4 + 8

    (*b*) Describe the methods of control at shop-floor of a
         manufacturing plant. What are the basic principles
         to be followed for controlling ?   5 + 3

2. (*a*) State and briefly describe a few important activities
         of human resource function of an organization. How
         does this function influence the overall performance
         of the organization ?   8 + 4

(b) Write short notes on (i) collective bargaining and its role in today's organizational context, and (ii) trade union and industrial relations.   4 + 4

3. (a) State the main factors to be considered for selecting a site for (i) a chemical plant, and (ii) an electronic goods manufacturing unit.   4 + 4

(b) Distinguish between product and functional layouts. For an office, what type of layout is preferred? Why?   3 + 3

(c) Identify different types of maintenance for a manufacturing unit. How is maintenance cost controlled?   3 + 3

4. (a) State any *four* objectives of inventory management. Why is selective inventory management used? What are the factors affecting the types of inventory problems? Briefly state them.   2 + 2 + 4

(b) Briefly describe continuous and periodic review inventory control systems. Derive the classical EOQ formula.   3 + 3

(c) State the main elements and working of an MRP system. Why is it used?   4 + 2

Group B

5. (a) Financial statements reflect the financial performance of a company. State the basic structure of balance-sheet and profit-and-loss statement indicating clearly their items.   4 + 4

(b) Define current asset and current liability.   2 + 2

(c) Samples of a balance-sheet and income statement are as follows:

Balance-sheet

Current Assets	Rs.	Current Liabilities	Rs.
Cash & Securities	40,000	Accounts payable	80,000
Accounts receivable	1,00,000	Notes payable	20,000
Inventory	3,00,000	Accrued expenses	10,000
Prepaid expenses	10,000	Current long-term debt	50,000
Fixed Assets		Long-term debt	3,00,000
Net plant & equipment	5,50,000		
		Owners' Equity	
		Preferred stock	1,40,000
		Common stock	3,00,000
		Retained earnings	1,00,000
Total Assets	1,000,000	Total liabilities to owner's equity	1,000,000

Income Statement

		Rs.
Sales		1,000,000
Direct material	4,00,000	
Direct labour	2,00,000	
Factory overhead	1,00,000	
Cost of goods sold	7,00,000	-7,00,000
Gross profit		3,00,000
Selling expenses	50,000	
Administrative expenses	1,00,000	
Total selling/administrative expenses	1,50,000	-1,50,000

Income Statement

	Rs.
Operating income	1,50,000
Interest expenses	50,000
Net income before taxes	1,00,000

Compute current ratio, acid test ratio, inventory turnover and throughput time (assuming 360 operating days per year) and interpret them.   8

6. (a) Describe the main elements of a TQM programme. State a few important objectives of TQM.   6 + 4

(b) What are the advantages of control charting? Why is acceptance sampling used? State how is quality improvement a possibility through TQM.   4 + 3 + 3

7. (a) State the important criteria for economic evaluation of a project.   6

(b) Identify the activities of a product development project.   4

(c) A project has the following characteristics:

Activity	Preceding Activity	Expected Completion Time, weeks
A	None	5
B	A	2
C	A	6
D	B	12
E	D	10
F	D	9
G	D	5
H	B	9

Activity	Preceding Activity	Expected Completion Time, weeks
I	C, E	1
J	G	2
K	F, I, J	3
L	K	9
M	H, G	7
N	M	8

(i) Draw a PERT network for the project.   5

(ii) Find the critical path and the project completion time.   3

(iii) Will the critical path change if activity G takes 10 weeks instead of 5 weeks? If so, what will be the new critical path?   2

8. (a) State a few important activities of a market research cell of an organization. Cite two examples of 'product brief'. For market research, a number of tools and techniques may be used. List any six of them.   5 + 2 + 3

(b) Define DSS. State the basic elements of an ERP system. Why has it assumed importance in today's context?   3 + 4 + 3

Group C

9. Answer the following in brief: 2 × 10

(i) State two essential features of scientific management.

(ii) State the difference between 'feedforward' and 'feedback' control.

(*iii*) Mention any *four* assumptions related to the classical EOQ formula.

(*iv*) The basis of ABC analysis for inventory is ———— and that of V-E-D analysis is ————.

(*v*) R-control chart is used to control ———— and $\bar{X}$-control chart is used to control ————.

(*vi*) State an example of all-units multiple price discount.

(*vii*) What is ISO 9000 standard?

(*viii*) Describe briefly the concept of e-business.

(*ix*) What is a 'matrix' organization? State one industrial situation where it is recommended.

(*x*) What are the *five* objectives of an effective MIS?

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S'10 : 3 FN : IC 402 (1411)

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) Identify *four* different approaches to management,
   and then define what you mean by the term
   'management'.   4

   (b) Which aspect, or principle, of Taylor's philosophy
   of scientific management corresponds most closely
   with some firms' efforts to improve the quality of
   work life today ?   4

   (c) Name *any three* Indian companies in each of the
   following form of business organisation :   2 x 4

   (i) Proprietorship

(*ii*) Joint stock companies

(*iii*) Partnership

(*iv*) Co-operative.

(*d*) Why do firms classify their materials according to ABC method of classification ? Explain.   4

2. (*a*) What support exists for the claim that management is a science ?   6

(*b*) A manufacturer of farm equipment is considering three locations *A*, *B*, and *C* for a new plant. Cost studies show that fixed cost per year at the sites are $240,000, $270,000, and $252,000, respectively, whereas variable costs are $100 per unit, $90 per unit, and $95 per unit, respectively. If the plant is designed to have an effective system capacity of 2500 units per year and is expected to operate at 80% efficiency, what is the most economical location on the basis of actual output ?   8

(*c*) What has been the effect of higher wages without corresponding increases in productivity ?   6

3. (*a*) Four different organisations are considering your hometown as a potential plant location : (*i*) A medical research centre, (*ii*) a soft drink producer, (*iii*) a steel mill, and (*iv*) a uranium mining firm. Select any *two* of the four, and systematically evaluate the relevant locational factors.   8

(*b*) Distinguish between job enlargement and job enrichment.   4

(*c*) Overland motors used 25,000 gear assemblies each year and purchases them at $3.40 each. It costs $50 to process and receive order, and inventory can be carried at a cost of $0.78 per unit-year. How many (*i*) assemblies should be ordered ? and (*ii*) orders per year should be placed ?.   4 + 4

4. (*a*) Distinguish amongst the following types of layout : (*i*) Fixed position, (*ii*) job shop, and (*iii*) line processing. Also, give some examples.   8

(*b*) What are major outputs from an MRP system ? In what way do MRP benefits extend to inventories, priorities, and capacities ? Explain.   8

(*c*) Distinguish between dependent and independent inventories. Give examples.   4

Group B

5. (*a*) What are essential differences between PERT and CPM ?   4

(*b*) A control chart is established, with limits of ± 2 standard errors, for use in monitoring sample of size $n = 20$. Assume the process is in control.

(*i*) Would you expect many individual values to lie outside these limits ?   4

(*ii*) How likely would a sample mean fall outside the control limits ?   4

(*iii*) What kind of error would be committed in erroneously concluding that the process is out of control ?   4

(c) What is the difference between data, information and knowledge ? Explain.   4

6. (a) What are different financial ratios ? Discuss their implications in financial management.   5

(b) What is e-commerce ? Discuss information security issues related to it.   5

(c) How do sampling plans for attributes differ from those for variables ?   5

(d) What is ERP ? How is it different from MRP ? Explain.   5

7. (a) An electrical firm has developed a PERT plan for the electrical wiring activity of power plant control panels. It expects that assesmbly operations will follow a 90 % learning curve. The project team, composed of workers, electricians, and supervisors, feels that the first assembly will most likely be completed in 14 days but could take as long as 24 days, or if everything went exceptionally well, it would be finished in 10 days. What is the expected assembly time of the fourth unit ?   5

(b) What is TQM philosophy ? Explain.   5

(c) Discuss essential components of a balance-sheet.   5

(d) What are generally the sub-systems in manufacturing module of an ERP package ?   5

8. (a) How will you start the selection process of an ERP package ? What would be the criteria for the selection ? What are the costs to be included in the budget for implementation of ERP ?   5

(b) What is ISO 9000 quality system ? Explain.   5

(c) Services are intangible products. Can the quality of services be measured ? Explain.   5

(d) How is the consumer behaviour assessed in the era of globalization ? Explain with examples.   5

Group C

9. (A) Choose the *correct* answer for the following :   2 x 4

(i) Variety reduction is generally known as
(a) less varieties
(b) simplification
(c) reduced varieties
(d) None of the above.

(ii) Line of best fit is another name given to
(a) method of least squares
(b) moving average method
(c) semi-average method
(d) trend line method.

(iii) The card, which shows the number of rejected products from the total quantity produced, is
(a) quality control card
(b) inspection card
(c) rejection card
(d) job card.

(*iv*) Route card and technological route card are

    (*a*) different types of documents

    (*b*) route card shows route and technological route card shows the technology used

    (*c*) same type of documents

    (*d*) one is prepared by the production manager and the other by the dispatcher.

(*B*) Expand the terms in list *A* and match them with the related functional areas of management in list *B* : 2 x 6

List A	List B
WIP	Project management
ISO	Quality philosophy
EOQ	Balance-sheet
P & L A/c	Quality system
TQM	Materials management
CPM	Inventory cost

W'10 : 3 FN : IC 402 (1411)

ENGINEERING MANAGEMENT

Time : Three hours

Maximum Marks : 100

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ANY TWO *from* **Group B** *and* ALL *from* **Group C** .

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

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with neat sketches. Unnecessary long answers may
result in loss of marks.*

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proper justification.*

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

Group A

1. (*a*) What is scientific management ? Outline the criticisms
    levelled against it.   5

    (*b*) Make a brief description of Henri Fayol's classifica-
    tion of management function.   5

    (*c*) What is meant by control ? How is it related to other
    functions of management ?   10

2. (*a*) Distinguish between (*i*) vocational selection,
    (*ii*) vocational guidance, and (*iii*) vocational training.
    Explain how they help in recruiting efficient personnel
    for a business concern.   12

(b) What is trade union ? What are its proper functions ? Bring out chief weaknesses of trade union.   8

3. (a) A plant is presently organised on a process layout basis. It is contemplated to replace the layout as a product layout. Prepare a statement for management in which you specify the circumstances that would justify such a changeover.   12

(b) What kind of private-sector/service facilities should be established in the hilly north-eastern states of India ? Give reason for your answer.   8

4. (a) Maruti automobile assembles four different types of cars on their assembly line. The assembly is done in batches. Given the following data, in which sizes of each type of vehicle should be produced ? The company has 300 working days in a year. Neglect the stock-out situation.   12

Vehicle	Annual Demand, unit	Setup Costs(per sat up), Rs.	Carrying Costs (per unit per year), Rs.	Assembling Rate (number per days)
Omni	9000	1000	40	100
Swift	5000	1000	50	120
Wagon R	10000	1000	60	100
M 800	3000	1000	30	90

(b) Explain how you would carry out material requirement planning (MRP). State the basic steps involved in setting up MRP.   8

Group B

5. From the information given below of a pencil manufacturing unit, prepare a projected balance-sheet, profit and loss account and then estimate the working capital requirements :   2

(a) Issued share capital   Rs. 3,00,000
    6% debentures   Rs. 2,00,000
    Fixed assets at cost   Rs. 2,00,000

(b) The expected ratios of cost to selling price are :

    Raw materials   50%
    Labour   20%
    Overheads   20%
    Profit   10%

(c) Raw materials are kept in store for an average of two months.

(d) Finished goods remain in stock for an average period of three months.

(e) Production during the previous year was 1,80,000 units and it is planned to maintain the same in the current year as well.

(f) Each unit of production is expected to be in process for half a month.

(g) Credit allowed to customers is three months and given by suppliers is two months.

(h) Selling price is Rs. 4 per unit.

(i) There is a regular production and sales cycle.

(j) Calculation of debtors may be made at selling price.

6. (*a*) Explain the term 'quality control'. How does quality control differ from conventional inspection?   5

(*b*) What do you understand by market research? How is it conducted?   5

(*c*) What are ISO 9000 standards? How do these differ from BIS (ISI) standards? Does ISO certification ensure the quality of the product? Discuss.   10

7. (*a*) Define an information system. What are the factors on which information requirements depend?   5

(*b*) Why is DBMS important for e - business?   5

(*c*) Identify the risks and governance issues an organization faces while migrating to an integrated ERP system.   10

8. Consider a project to construct a small hydroelectric power plant. The details of different activities, their precedence constraints, and the estimated times are given below :

Activity	Description	Immediate Predecessor	Duration
a	Ecological survey	—	6·2
b	File environmental impact report; get approval	*a*	9·1
c	Economic feasibility study	*a*	7·3
d	Preliminary design and cost estimation	*c*	4·2
e	Project approval and funding commitments	*b*, *d*	10·2
f	Call quotation for equipment (turbines, generators)	*e*	4·3
g	Select supplier for equipment	*f*	3·1
h	Final design of project	*e*	6·5
i	Select construction contractor	*e*	2·7
j	Arrange construction materials supply	*h*, *i*	5·2
k	Dam building	*j*	24·8
l	Power station building	*j*	18·4
m	Power lines erection	*g*, *h*	20·3
n	Turbines, generators installation	*g*, *l*	6·8
o	Build-up reservoir water level	*k*	2·1
p	Commission the generators	*n*, *o*	1·2
q	Start supplying water	*m*, *p*	1·1

(*i*) Construct the PERT chart.   5

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(*ii*) What is the earliest time that one can complete the entire project?   5

(*iii*) Which activities have bottlenecks?   5

(*iv*) What is the latest time that one can begin an activity, and still not delay the project?   5

Group C

9. (*A*) Choose the *correct* answer for the following :   10 × 1

(*i*) Real founder of motion study was

    (*a*) F.W. Taylor

    (*b*) F.B. Gilbreth

    (*c*) H.L. Grantt

    (*d*) H. Emerson

(*ii*) Continuous manufacturing factories adopt

    (*a*) product layout.

    (*b*) process layout.

    (*c*) combined layout.

    (*d*) fixed layout.

(*iii*) Work study is most useful where

    (*a*) production activities are involved.

    (*b*) industrial relationship is to be improved.

    (*c*) worker is to be proved wrong.

    (*d*) image of the manager is to be improved.

(*iv*) Which one of the following description of the concept of line and staff is correct?

    (*a*) Represents a specification of managerial function.

(*b*) Is regarded as a type of organisation structure.

(*c*) Is regarded as specific types of departments.

(*d*) Is simply a matter of line and staff relationship.

(*v*) Critical path moves along the activities having total float of

    (*a*) positive value.

    (*b*) negative value.

    (*c*) zero value.

    (*d*) same value.

(*vi*) The word 'fund' means the difference between ———— and ————.

(*vii*) Mention *three* steps involved in developing an information system.

    (*a*) Specification, design, testing

    (*b*) Programming, design, and testing

    (*c*) Analysis, system design, and implementation

    (*d*) Programming, design and analysis.

(*viii*) Which one of the following system components is responsible for ensuring that the system is working to fulfil its objective?

    (*a*) Inputs

    (*b*) Feedback

    (*c*) Control

    (*d*) Outputs.

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(*ix*) Decision support systems are used by

    (*a*) line managers.

    (*b*) top-level managers.

    (*c*) middle-level managers.

    (*d*) system users.

(*x*) Which one of the following terms defines the process of project compliance with policies and procedures ?

    (*a*) Quality contol

    (*b*) Quality assurances

    (*c*) Quality audits

    (*d*) Quality control management.

(*B*) Answer the following in brief :   5 x 2

(*i*) Define span of control.

(*ii*) Define collective bargaining.

(*iii*) Define merit rating.

(*iv*) What is the meaning of project crashing ?

(*v*) A production process producing nails is being controlled for quality. The single important characteristic of quality is the hardness of nails, and accordingly a sample of three nails is periodically tested for hardness. The data on *five* samples is given below :

Sample No.	Hardness		
1	72	70	74
2	69	68	70

Sample No.	Hardness		
3	66	70	74
4	70	71	69
5	69	73	74

If, for a sample of size 3, values of factors for $\bar{X}$ and R charts are : $A_2 = 1.02$, $D_3 = 0$, $D_4 = 2.57$, the 3σ control limits for R charts are ———— .

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W'11 : 3FN : IC 402 (1411)

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.**

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Group A

1. (*a*) What is cellular manufacturing system ? Explain cell
        layout and how it helps in reducing material handling
        equipment, with the help of a suitable example. 1 + 2 + 2

    (*b*) Define the term 'management'. Also, explain briefly
        mission functions of management.   2 + 2

    (*c*) Highlight the contribution of HL Gantt, H Fayol and
        Gilbreth.   2 × 3

    (*d*) What do you mean by ABC classification ? Discuss
        different types of inventory control system according
        to different classes of ABC.   2 + 3

2. (*a*) Differentiate between process layout and product
        layout on at least *any nine* criteria like quality issue.   4

(b) Explain MRP II with the help of its flow diagram. Indicate different input and output with a suitable example.   3 + 2

(c) What are the different roles as described by the Mintzberg. Explain each with a suitable example.   2 + 3

(d) Describe the following :   6 × 1

    (i) Parity principle

    (ii) Acceptance theory

    (iii) Authority and its delegation

    (iv) Scalar chain of command

    (v) Division of labour

    (vi) Functional authority.

3. (a) Explain different factors that affect the decision of location of a hospital.   4

  (b) What are different types of inventories ? Explain each one in detail. What are the advantages and disadvantages of holding the inventory ?   1 + 2 + 2

  (c) Classify the controlling approaches. Explain autocratic and clan control style. Also, explain bench marking.   2 + 2 + 2

  (d) What do you mean by environment of an organization ? Explain SWOT analysis. What are different types of plans.   2 + 2 + 1

4. (a) What do you mean by the function 'organizing' ? Enlist the advantages and disadvantages of line organization and matrix organization.   2 + 2

  (b) Explain Maslow's hierarchy of needs. Also, explain motivation cycle.   2 + 2

(c) ABC company produces brass door knockers, among other things. The company expects the next year demand for door knockers to be 20,000 units at a uniform rate. It costs $125 to set up the equipment to produce the door knockers, and production rate is 5000 units per month. The company accountant estimates that it costs $0·40 per year to hold a door knocker in inventory.

    (i) How many knockers should company produce each time it initiates production of knockers ?   4

    (ii) It takes 3 weeks from the time the warehouse orders more knockers until finished knockers begins to arrive. At what inventory level should the company release production orders, if it desires 1.5 times the average lead time used to be designated as safety stock ?   2

(d) Five jobs are to be on two processes, all in the sequence of first process 1 and then process 2. The duration of the operations are indicated in the table below :

Job	Time, hr	
	Process 1	Process 2
A	4	2.2
B	3	3.5
C	2	2.6
D	4	4.0
E	4.5	2.5

Sequence the job according to Johnson's rule. Use a Gantt chart to show how long, after the start of the first job on process 1, each job will be completed process 2.   6

Group B

5. (a) Given the information below for ABC Co., prepare the balance-sheet and income statement :   3 + 2

Loan payable	Rs. 2500	Cash	Rs. 10,125
Buildings	Rs. 22450	Utility expenses	Rs. 750
Supplies expenses	Rs. 5000	Retained earning	Rs. 17500
Supplies on-hand	Rs. 3750	Accounts payable	Rs. 5000
Miscellaneous expenses	Rs. 7000	Sales	Rs. 25,000
Accounts receivables	Rs. 12500	Capital Stock	Rs. 61450
Salary	Rs. 12500	Land	Rs. 37375

(b) Explain, with a suitable example, direct cost, indirect cost, sunk cost, opportunity cost, and salvage value.   5

(c) List the advantages and disadvantages of Taguchi method.   3

(d) (i) Explain the product life-cycle taking the example of radio and transistor.   5

     (ii) What do you mean by marginal productivity ?   2

6. (a) What are the factors of production ? Explain the total, average and marginal product. Why are average cost, marginal cost and avergae cost curves are U-shaped ?   1 + 2 + 1

(b) Explain transaction theory of firm with the help of a suitable example.   3

(c) Explain MBNQA in detail through its purpose, criteria for performance, and characteristic of criteria. Supplement your answer with a neat sketch.   1 + 2 + 2

(d) List the steps of the product design and explain them briefly. What are the general approaches to promote the new product in the market.   2 + 2

(e) Explain the objective of e-commerce and its benefits.   2 + 2

7. (a) Information concerning a project is given below. Indirect project cost amounts to $250 per day. The company will incur a cost $100 per day penalty for each day the project last beyond day 14.

     (i) Draw AON network. What is project duration only if normal times are used ?   2 + 1

     (ii) What is the minimum cost schedule ?   4

     (iii) What is the minimum path for the minimum cost schedule ?   1

Activity	Normal Time, days	Normal Cost, $	Crash Time, days	Crash Cost, $	Immediate Predecessor
A	5	1000	4	1200	None
B	5	800	3	2000	None
C	2	600	1	900	A, B
D	3	1500	2	2000	B
E	5	900	3	1200	C, D
F	2	1300	1	1400	E
G	3	900	3	900	E
H	5	500	3	900	G

(b) What do you mean by productivity ? Explain its type in brief.   1 + 2

(c) What is Total Quality Management ? Explain how it differs from six sigma.   3 + 2

(d) Explain difference between fact, data and information. What is the role of information in organization dealing with e-commerce ?   2 + 2

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8. (a) Differentiate between financial accounting and managerial accounting.   4

(b) The specifications for one dimension of s part are $1\cdot750 \pm 0\cdot003$ cm. When parts of this general size are made, the process has a standard deviation of measurement of $0\cdot0015$ cm.

(i) Calculate the process capability index. Is the process capable of meeting this specification ?   2

(ii) If the process is used and it is kept centered at $1\cdot750$ cm, what percentage of the parts will be outside the specifications for this dimension ?   3

(iii) Suppose the company wishes to produce 10000 parts that are within the specifications and that it operates the process centered at $1\cdot750$ cm. All parts that are outside the specification are scrapped, and company will receive only $ 1.00 for each of them. It costs the company $36 to produce each part. How many parts should the company start to produce so that it expect 10000 good parts ? What would be the cost of internal failure in this case ?   3

Cumulative Probabilities of the Normal Distribution
(Areas under the standardized normal curve from $-\infty$ to z)

z	0.00	0.01	0.02	0.03	0.04	0.05
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929

(c) Explain DuPont analysis and its use.   4

(d) (i) What is the 'law of diminishing marginal return' ? Define scales of economics.   2

(ii) Explain the advantages of sampling.   2

Group C

9. Choose the *correct* answer for the following :   20 × 1

(i) Micro-motion study is attributed to

(a) F W Taylor

(b) H L Gantt

(c) Elton Mayo

(d) Gilbreth

(ii) System of working developed by F W Taylor is

(a) line organization.

(b) line and staff organization.

(c) effective organization.

(d) functional organization.

(iii) A chart, indicating a horizontal span of control and vertical distribution of authority, is called as

(a) authentication chart.

(b) Pi chart.

(c) organization chart.

(d) span chart.

(iv) Acceptance sampling is widely used in

(a) batch production.

(b) cellular manufacturing system.

(c) mass production.

(d) All of the above.

(*v*) Standard deviations for three samples are 5, 6, and 8. If these samples are merged, what will be the standard deviation ?

(*a*) 19.00

(*b*) 11.18

(*c*) 125.00

(*d*) 8.00

(*vi*) A wink is equal to

(*a*) 1/2000 MIN

(*b*) 1/1000 MIN

(*c*) 1/2500 MIN

(*d*) 1/3000 MIN

(*vii*) What is the difference between TQM and Six Sigma ?

(*a*) TQM relates to Kaizen while Six Sigma to zero defect.

(*b*) TQM focuses on employee involvement while Six Sigma does not.

(*c*) In Six Sigma, SPC is used while in TQM, SPC has no significance.

(*d*) All of the above.

(*viii*) Monitoring and follow up work intended for completion of job within the due date is

(*a*) scheduling.

(*b*) expediting.

(*c*) routing.

(*d*) None of the above.

(*ix*) Process layout

(*a*) allows low variety and high volume mass production.

(*b*) allows variety of products to be made on the same facility.

(*c*) has the dedicated facility which lead to full automation on demand.

(*d*) All of the above.

(*x*) For a given level of safety stock and EOQ ordering, re-ordering point

(*a*) depends only on the rate of consumption.

(*b*) is independent of the rate of consumption and lead time.

(*c*) depends only on the lead time.

(*d*) depends on lead time and consumption rate.

(*xi*) EOQ is within the range of the lowest discounted rate offered, then

(*a*) accept the discount offer and order for the minimum in the range.

(*b*) reject the discount order.

(*c*) consider the total cost of the ranges of discount before taking the decision.

(*d*) accept the discount offer and order at EOQ level.

(*xii*) The method of classification of items to be adopted for spare parts inventory is

(*a*) ABC analysis

(*b*) XYZ analysis

(*c*) VED analysis

(*d*) SDE analysis.

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(*xiii*) Match the items of list A with the items of list B and give the correct response using the code written in parenthesis.

List A	List B
(P) MRP	(A) Manufacturing time
(Q) JIT	(B) Planned order release
(R) ROP	(C) Closing inventory
(S) EOQ	(D) Pull system
(T) Safety stock	(E) Stock level
(U) ABC	(F) Costly items
	(G) Balancing the ordering cost and carrying cost
	(H) Selective control
	(I) Fluctuation in the lead time

(*a*) P-B, Q-D, R-E, S-G, T-I, U-H

(*b*) P-B, Q-D, R-E, S-G, T-I, U-F

(*c*) P-B, Q-D, R-I, S-G, T-E, U-H

(*d*) P-B, Q-D, R-I, S-G, T-E, U-F

(*xiv*) The optimality of transportation is checked by the following method :

(*a*) N-W corner method

(*b*) VAM

(*c*) MODI method

(*d*) Least cost method.

(*xv*) A free float is

(*a*) one which does not affect the EST of successors.

(*b*) one which affects EST of successors.

(*c*) one which does not affect the EST of successors but project length.

(*d*) one which affects the EST of successors but project length.

(*xvi*) In a CPM netwok, critical path is

(*a*) shortest path.

(*b*) longest path.

(*c*) moderate path.

(*d*) None of the above.

(*xvii*) In a PERT network, the activity duration is assumed to be

(*a*) Normally distributed.

(*b*) Beta distributed.

(*c*) Linearly distributed.

(*d*) Poisson distributed.

(*xviii*) Direct cost of an activity is

(*a*) directly proportional to its duration.

(*b*) inversely proportional to its duration.

(*c*) associated with total project time.

(*d*) None of the above.

(*xix*) The amount sold on credit by a firm is indicated under the

(*a*) assets side of the balance-sheet.

(*b*) liabilities side of the balance-sheet.

(*c*) sundry head.

(*d*) None of the above.

(*xx*) Balance-sheet is based on the following accounting principle :

(*a*) Assets + liabilities = Net worth

(*b*) Assets – liabilities = Net worth

(*c*) Assets – liabilities = Profit

(*d*) Net worth – assets = Liabilities.

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S'12:3FN : IC402 (1411)

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*) What support exists for the claim that management is a science ? Explain.   5

   (*b*) Does the expected monetary value criterion (EMV) always provide the decision maker with the best course of action ? Explain.   5

   (*c*) A manufacturer of farm equipment is considering three locations (*A*, *B*, and *C*) for a new plant. Cost studies show that fixed costs per year at the sites are $ 2,40,000, $ 2,70,000 and $ 2,52,000, respectively, whereas variable costs are $ 100 per unit, $ 90 per unit, and $ 95 per unit, respectively. If the plant is designed to have an effective system capacity of 2500 units per year and is expected to operate at 80 percent efficiency, what is the most economic location on the basis of actual output ?   5

(Turn Over)

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(d) Distinguish among the following types of layout :
(i) Fixed position, (ii) job-shop, and (iii) line processing.
Give examples of each type.   5

2. (a) What are the major outputs from an MRP system ? In what way do MRP benefits extend to inventories, priorities, and capacities ?   5

(b) Which aspect, or principle, of Taylor's philosophy of scientific management corresponds most closely with some firms' efforts to improve the quality of work life today ? Explain with an example.   5

(c) Distinguish between dependent and independent inventories. Give some examples.   5

(d) In what major respect are facilities and personnel maintenance different ? Give examples.   5

3. (a) What aspects of goals are especially important when applying them at the job design level ? Explain.   5

(b) Discuss the following in brief :   3 + 3
(i) Participative management
(ii) Collective bargaining
Give one example of each.

(c) Give an example of a situation where a pure planning strategy would be infeasible from a practical standpoint.   4

(d) In what respect is the location of goods producing facilities more flexible than that of service-producing facilities ? Explain.   5

4. (a) Identify four different approaches to management, and then define what you mean by the term 'management'. 5

(b) A producer needs to add a component sub-assembly operation that can produce 80 units during a regular 8 hr shift. The operations have been designed for three activities with times as shown below :

Operation	Activity	Standard Time, min
A	Mechanical assembly	12
B	Electric wiring	16
C	Test	3

(i) How many work-stations (in parallel) will be required for each activity ?   5

(ii) Assuming that the workers at each station cannot be used for other activities in the plant, what is the appropriate percentage of idle time for this sub-assembly operation ?   5

(c) How is recruitment process of an IT company different from the same of a manufacturing company ? Explain.   5

Group B

5. (a) What are the essential differences between PERT and CPM ? Give an example of each.   5

(b) How are control charts for variables different than the control charts for attributes ? Explain.   5

(c) What are different financial ratios ? Discuss their implications.   5

(d) What is ERP ? How is it different from MRP-I and MRP-II ?   5

6. (a) Discuss different acceptance sampling plans used in SQC. Give examples of each plan with their merits and demerits.   10

(b) Discuss the following :   5 + 5

(i) Fund flow statement

(ii) Profit and loss statement.

7. (a) Define the following :   4 + 3 + 3

(i) Quality assurance

(ii) Quality planning

(iii) Total quality management.

(b) Discuss the role of information technology in pricing and promotion of products in the scenario of globalization. Give some examples.   10

8. (a) Define the following :   5

(i) Fixed and current asset items

(ii) Fixed and current liability items.

(b) What is ISO 9000 quality system ? Discuss its various clauses and provisions.   7

(c) What is the 'law of diminishing marginal return' ? Explain.   4

(d) What is e-commerce ? Give some of its benefits.   4

Group C

9. Answer the following in brief :   10 × 2

(i) What is CRAFT and ALDEP ?

(ii) What is marginal productivity ?

(iii) What do you understand by the crashing of the activity ?

(iv) What is mass customization ?

(v) What is decision support system ?

(vi) What are different types of organizations ?

(vii) What is ABC classification of inventory ?

(viii) What is preventive maintenance ?

(ix) What are 'BOM' and 'MPS' in MRP ?

(x) What is a balance-sheet ?

S'13 : 3 FN : IC402 (1411)

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) Identify *four* different approaches to management,
        and then define what do you mean by the term
        'management'.   7

    (b) What support exists for the claim that management is
        a science ?   6

    (c) What are the *five* steps suggested for making location
        decisions ?   7

2. (a) A contractor is evaluating its machine shop's current
        process layout. The figure below shows the current
        layout and the table shows the trip matrix for the
        facility.

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Health and safety regulations require departments *E* and *F* to remain at their current positions :

E	B	F
A	C	D
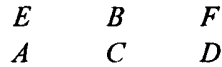
'Current layout'

From/To	A	B	C	D	E	F
A		8	3		9	5
B		—		3		
C			—		8	9
D				—		3
E					—	3
F						—

Can layout be improved ? Also, evaluate using load distance (ld) score.   10

(*b*) Demand for a product was doubled during a 3-year period. At a management meeting, the inventory manager was asked to explain why his order size for this product had failed to increase in a proportional (linear) amount to demand. How should he respond ?   5

(*c*) Distinguish between dependent and independent inventories. Give examples of each type of inventory.   5

3.   A firm producing wheelbarrows is expected to deliver 40 wheelbarrows in week 1, 60 in week 4, 60 in week 6, and 50 in week 8. Among the requirements for each wheelbarrow are two handlebars, a wheel assembly, and one tire for the wheel assembly. Order quantities, lead times, and inventories on hand at the beginning of period 1 are shown below :

Part	Order Quantity	Lead Time, Week	Inventory on Hand
Handlebars	300	2	100
Wheel assemblies	200	3	220
Tyres	400	1	50

90 wheel assemblies are also needed in period 5 for a garden tractor shipment. A shipment of 300 handlebars is already scheduled to be received at the beginning of week 2. Complete the material-requirements plan for the handlebars, wheel assemblies, and tyres and show what quantities of orders must be released and when they must be released in order to satisfy the master production schedule.   20

4.   (*a*) Distinguish between job enlargement and job enrichment.   7

(*b*) Derive expression for basic EOQ model.   7

(*c*) Explain the objectives of maintenance.   6

Group B

5.   (*a*) What are the heads of expenditure that may be incurred for ERP implementation ?   6

(*b*) How does the quality circle approach to quality control differ from the traditional approach of inspection by a quality control inspector ?   7

(*c*) Enumerate the differences between CPM and PERT.   7

6.   (*a*) What are different financial ratios ? Explain.   7

(*b*) 'KOLAVERI DE' song is a classic case of viral marketing'. Elucidate this statement.   6

(c) A daily sample of 30 items was taken over a period of 14 days in order to establish attributes control limits. If 21 defectives were found, what should be LCL_p and UCL_p ?   7

7. (a) What is market research and analysis ? Explain how it is conducted ?   7

(b) What is imprest ? How is it maintained ?   6

(c) Explain the role of goodwill in sales. Does an organization having impeccable goodwill requires advertising ? Explain.   7

8. (a) What is double entry system in accountancy ? Explain.   7

(b) Discuss the role of EDI in e-commerce. Give some examples.   6

(c) How do sampling plans for attributes differ from those for variables ?   7

Group C

9. Answer the following in brief :   10 × 2

(i)   What is backordering inventory cost ?

(ii)   What is breakdown maintenance ?

(iii)   Define BOM and MPS in MRP.

(iv)   What is participative management ?

(v)   What is CRAFT ?

(vi)   What is crashing in project management ?

(vii)   What is bad debt ?

(viii) What is quality ?

(ix)   What is a learning curve ?

(x)   What are data, information and knowledge ?

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W'12 : 3 FN : IC402 (1411)

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.*

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result in loss of marks.*

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proper justification.*

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Group A

1. (*a*) Briefly explain what a limited partnership is ? Explain
under what circumstances you might considered to be
a partner against your wishes ? Describe the duties
and responsibilities of such partners.   3 + 3 + 4

   (*b*) 'Elective management is management by objective
(MBO)'. Discuss.   5

   (*c*) What are the principles of management propagated
by Henry Fayol ?   5

2. Write short notes on the following :   5 × 4

   (*a*) Responsibility and authority
   (*b*) Span of control
   (*c*) Effective delegation
   (*d*) Communication
   (*e*) Balance, stability and flexibility

3. (*a*) An industry requires manufacturing of five different components on a vertical milling machine. The plant operates one shift of 40 hr/week. The quantity required for each component and the machine capacity for producing each component are shown in Table 1 :

Table 1

Component	Pieces Required, week	Machine Capacity, hr
A 100	4560	30
DE5	3040	40
CD200	190	50
LP54	570	37.5
XA254	760	50

Taking into account the set-up allowances, down time losses etc., the machine produces only 80% of its capacity and rejects are 5%. How many machines are required for the purpose ?   8

(*b*) With a suitable example, write the advantages and limitations of (*i*) product layout, (*ii*) process layout, and (*iii*) static product layout.   3 × 4

4. (*a*) Describe the factors on which decision components of purchasing capital equipment, plant and machinery depends.   8

(*b*) Write a note on 'classification of inventories'. How can the firm reduce its investment in inventories ?   6 + 6

Group B

5. (*a*) Explain the following :   4 + 4

(*i*) Master budget
(*ii*) Effective budgetary control.

(*b*) What is project report ? What do you mean by appraisal of projects ? Discuss the utility of network technique in management of the project.   4 + 4 + 4

6. (*a*) Define quality. Describe the distinguishing features of total quality management vis-a-vis conventional quality management.   8

(*b*) In order to compete in the world market, the company wants to make changes in its quality practices. Justify why it will go for ISO 9000 certification. Write different levels of documentation for ISO 9001:2000.   6 + 6

7. (*a*) Write a brief note on Dodge-romig sampling plan.   8

(*b*) What is control chart ? Name different types of control chart for attributes and variables. Write the sensitizing rules for Shewhart control charts.   4 + 4 + 4

8. (*a*) What is information system design ? Describe the major steps of information system design.   2 + 6

(*b*) What are the benefits of an ERP system ? Write questions to be asked before considering ERP implementation in your industry.   4 + 8

Group C

9. Answer the following in brief :   10 × 2

(*i*) Pictorially show the 'River' convergent flow.

(*ii*) Material cycle

(*iii*) Red-Flagging rule for a non-critical activity (*i*, *j*)

(*iv*) What is a balance-sheet ?

(*v*) Draw OC curve showing its salient points

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(*vi*)   Sargent theory of location factor

(*vii*)   Travel chart

(*viii*)   Mass customization

(*ix*)   Annual requirement of diesel oil for a power station is 12000 litre. Purchase are made in bulk of 10,000 litre. The ordering cost is ₹ 375 per order and inventory carrying cost is ₹2 per litre. Find EOQ and the total cost.

(*x*)   Predictive maintenance.

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W'13 : 3 FN : IC 402 (1411)

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.**

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Group A

1. (*a*) What support exists for the claim that management is a science ?   6

   (*b*) Describe various functions of management.   7

   (*c*) F. W. Taylor originated the idea of scientific management. Comment on this statement.   7

2. (*a*) Describe various types of organisations stating their salient features with the help of a neat diagram.   14

   (*b*) Write a note on 'delegation of authority'.   6

3. (*a*) Explain the functions and responsibilities of human resource management with the help of line diagram(s).   15

   (*b*) What are the rights and liabilities of a registered trade union ?   5

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4. (a) Explain the factors affecting site selection of a factory. **12**

   (b) ABC Corporation has got a demand for a particular part at 10,000 units per year. The cost per unit is Rs. 2 and it costs Rs. 36 to place an order and to process the delivery. The inventory carrying cost is estimated at 9 per cent of average inventory investment. Determine the (i) economic order quantity, (ii) optimum number of orders to be placed per annum, and (iii) minimum total cost of inventory per annum. **3 + 3 + 2**

Group B

5. (a) What is double entry system in accountancy? Explain. **7**

   (b) What is imprest? How is it maintained? **2 + 5**

   (c) Enumerate the differences between CPM and PERT. **6**

6. (a) Describe the salient features of ISO 9000 series. **10**

   (b) Describe in brief the elements of Total Quality Management. **10**

7. (a) Discuss the role of EDI in e-commerce. **8**

   (b) What are the guidelines for identification of projects for existing industries. **12**

8. (a) Describe the role of management information system and decision support system in engineering management. **6 + 6**

   (b) What is market research and analysis? Explain how it is conducted. **4 + 4**

Group C

9. Answer the following in brief:

   (i) What is breakdown maintenance?

   (ii) What is quality?

   (iii) State different classes of inventory.

   (iv) Define MPS in MRP.

   (v) What is productivity?

   (vi) What is a learning curve?

   (vii) What is control chart?

   (viii) What is CRAFT?

   (ix) What is participative management?

   (x) What is slack?

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