

Time: 3 hours

Marks: 80

- Note:**
1. Assume suitable data if necessary
 2. Figures to the right indicate full marks
 3. Question No. 1 is compulsory
 4. Solve any three out of the remaining five questions

Q1.	Write short notes on following: (Any Four)	
A	Dielectric elastomers	5
B	Microstructural fabrication.	5
C	Piezoelectric effects	5
D	Artificial skin	5
E	Hydrogen storage.	5
F	Micromanufacturing	5
Q2.		
A	Explain a term memory and energy storage.	5
B	State applications of Nano composite.	5
C	Explain six step actuation process of Piezo Inchworm motor and state it's applications.	10
Q3.		
A	What is Hysteresis? State it's applications.	5
B	Write down Different classifications of Self replications.	5
C	What is Magnetostriction? Describe working of Magnetostriction Ultrasonic Generator device with the help of neat sketch.	10
Q4.		
A	Explain a term synthesis of ferrofluids.	5
B	What is the difference between Piezoelectric and Magnetostrictive transducers.	5
C	Explain synthesis, types and applications of Carbon Nanotubes	10
Q5.		
A	Explain with neat sketches one way and two way Shape memory effect.	5
B	Describe various types of Energy Storage.	5
C	What are the various Energy Harvesting challenges? Explain Vibration energy Harvesting techniques.	10
Q 6.		
A	Write advantages of Generative manufacturing processes.	5
B	What is Self assembly process? Describe top-down and bottom-up approaches of self assembly.	5
C	Write short note on: 1. Stereolithography (STL) 2. Ballistic Particle Manufacturing (BPM)	10

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Note-

1. Question one is compulsory.
2. Solve any three out of remaining five.

- Q.1 Explain any four of the following. 20**
- a Definition of Product quality and service quality
 - b Significance of Quality management
 - c Draw diagram Root cause analysis
 - d List out Barriers to TQM work
 - e Explain Win –Win policy with supplier.
- Q.2 a The data shows the sample mean and range for 10 samples for size 5 each. Find the control limits for mean chart and range chart. 10**

Sample	1	2	3	4	5	6	7	8	9	10
Mean	21	26	23	18	19	15	14	20	16	10
Range	5	6	9	7	4	6	8	9	4	7

- Q.3 a Explain Quality management system certification process 10**
- a Explain Six sigma definition, concept and methodology 10**
- b Explain various steps involves implementing TQM in manufacturing industries with case study 10**
- Q.4 a What is ISO 9000? Explain ISO 9000 system implementation process. 10**
- b Describe the contribution of Tauguchi to quality management. 10**
- Q.5 a Explain the purpose of giving Malcom Baldrige quality award. 10**
- b Explain the following charts 10**
- (i) Producer risk
 - (ii) Consumer risk
 - (iii) AQL
 - (iv) LTPD
- Q6 a 1.Explain the Barriers of TQM? 5**
- 2.Write note on cost of quality 5**
- b What is BPR concept? List out the process involves in the BPR concept implementation 10**

3 Hours

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Instructions:

1. Question Number 1 is **Compulsory**
2. Attempt **ANY THREE** Questions out of remaining **FIVE**.
3. Use illustrative diagrams wherever required

Q1) Attempt any **FOUR** questions

- | | | |
|----|--|-----------|
| a) | Define new product. List various types of new products. | 05 |
| b) | Draw figure showing the steps or phases of the product development process. | 05 |
| c) | Define Quality Function Deployment (QFD). List the steps of QFD. | 05 |
| d) | Differentiate between engineering design and industrial design. | 05 |
| e) | What do you mean by golden ratio of proportion? Give examples of golden ratio uses in day-to-day life. | 05 |
| f) | Explain the term Design for Environment. | 05 |

Q2) a) What is product life cycle? Explain the four phases of product life cycle with diagram. **10**
 b) Define market research. Explain the methods of market research required in the product design and development. **10**

Q3) a) For redevelopment of a consumer product “college backpack”, prepare concept selection matrix. Generate the concept, screen the concept, score the concept and rank the concept. **10**
 b) Explain in brief various concept generation and selection methods. **10**

Q4) a) What is House of Quality (HoQ)? Explain various components of HoQ. **10**
 b) Draw House of Quality (HoQ) for a consumer product “college backpack”. **10**

Q5) a) Define creative thinking and creativity. List the Creativity and problem-solving methods. Explain any ONE method. **10**
 b) What are the basic forms and elements of a product? Why it is necessary to integrate the basic forms and elements? Explain with examples. **10**

Q6) a) What is DFMA? Explain the steps used in DFMA giving examples. **10**
 b) Write short notes on **05**
 a) 3 D printing method
 b) Role of computers in product design and manufacturing **05**

Duration: 3 Hours

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1. Question 1 is Compulsory
2. Attempt any three questions out of the remaining five.
- 3.. All questions carry equal marks
- 4.. Assume suitable data, if required and state it clearly.

Q 1 Answer **any four** questions

20

1. Draw Production systems line sketch and list out production system components
2. List out Production planning and control functions
3. Explain Product Life cycle with diagram
4. Explain various terms associated with line balancing.
5. Write notes on MRP flow chart
6. Explain the objectives of Facility planning.

2 a) A company manufactures the consumer durable products and the company intends to develop an aggregate plan for six months starting from January through June. The following information is available.

10

<i>Month</i>	Jan	Feb	Mar	Apr	May	Jun
<i>Demand</i>	500	600	650	800	900	800
<i>Working days</i>	22	19	21	21	22	20

Cost Details

Materials Rs. 100/unit, Inventory carrying cost - Rs. 10/unit/month,
 Cost of stock out Rs. 20/unit/month, cost of subcontracting Rs.200/unit,
 Hiring and training cost Rs. 50/worker, Lay off cost Rs.100/ worker,
 Labor hours required Rs. 4/unit, Regular time cost (for first 8hours) Rs.12.50/-per hour
 Over time cost Rs.18.75/- Per hour, Beginning inventory 200 units. Safety stock required –Nil

Work out the cost of the constant work force – Varying inventory and allow shortages Strategy

Q2 b) Define (i) Design capacity (ii) System capacity (iii) Installed capacity (iv) Licensed capacity (v) Rated capacity

10

Q3 a) Define process design and explain the framework of process design by means of a block diagram?

10

Q3 b) The following data refers to the past sales of one product. **10**

Year	2015	2016	2017	2018	2019	2020	2021	2022	2023
Sales in Lakhs	3.9	5.4	6.2	7.3	8.5	10	9.5	10.5	12

Use Least square method and estimate sales forecasting of year 2024

Q4 A) Seven jobs are to be processed through three machines A,B and C in the sequence ABC. The processing times are given in hrs to process each one of the jobs through all the three machines. Find the optimal sequence of the jobs that minimizes the total elapsed time and find idle time associated with machines B and C **10**

Jobs	J1	J2	J3	J4	J5	J6	J7
A	3	8	7	4	9	8	7
B	4	3	2	5	1	4	3
C	6	7	5	11	5	6	12

Q4 B) . Explain the various terms associated with MRP. Explain the steps of creating MRP master schedule with any end item X. **10**

Q5 A) 4.) A small project is composed of time activities whose time estimates are given below **10**

Activity	A	B	C	D	E	F	G	H	I
t_o	2	2	4	2	2	3	2	5	3
t_m	2	5	4	2	5	6	5	8	6
t_p	8	8	10	2	14	15	8	11	15

t_o - Optimistic time, t_m Most likely time, t_p - Pessimistic time , Activity A,B and C can start simultaneously. Activity D follows activity A while E follows B. Activity D and E are followed by activity G while F is dependent on C , H depends on D and E While I depends on F and G (i) Construct the network diagram (ii) determine Expected time and variance (iii) What is the critical path and expected project duration of the project

Q5 B) Define plant layout? What are the various types of layout? Explain the application of each layout **10**

Q6 (A) Explain ERP modules for operation planning and materials management **10**

Q6 B) Explain Agile Manufacturing systems with block diagram and features compare with other production system **10**

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(3 Hours)

Total Marks: 80

Note:

1. Question No.1 is compulsory
2. Attempt any **three** out of the remaining **Five** questions.
3. Assume suitable data if necessary.

Q. 1. Answer **any FOUR** of the following: (20)

- (a) Enlist two points as to why private company is more desirable than a public company.
- (b) Discuss role of Capital markets in Entrepreneurial Development.
- (c) Explain the factors involved in the growth of an Enterprise.
- (d) State any four unique characteristics of Entrepreneur.
- (e) Differentiate between Sales Budget and Marketing Budget?
- (f) What are the issues faced by micro and small enterprises? Discuss on risk management.

Q. 2. (a) What are the four types of Firm-level growth strategies? (10)

- (b) State any four primary activities that are essential for a firm to have a competitive advantage as given by Porter (10)

Q. 3. (a) Write short note on Women Entrepreneurship Development with example. (10)

- (b) Entrepreneurs are “Dreamers with vision”. State how. (10)

Q. 4. (a) Discuss role of Capital markets in Entrepreneurial Development. (10)

- (b) Explain in short about Industrial Investment Bank of India Ltd. (IIBI) (10)

Q. 5. (a) Write in short about MSMED Act 2006. (10)

- (b) Who are Angel Investors? State any four features of Angel Investors. (10)

Q. 6. Answer the following. (20)

- (a) Explain the uses of Project Report for Entrepreneur.

- (b) What is EDP Cell? What are its features?
