

BE | sem VIII | C-scheme R-19 | Mechanical

QP-10070679

09/10/24

Time: 3 hours

Total 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 | Generic Product Development Process | 05 |
| B | Product Design | 05 |
| C | Product Development | 05 |
| D | Modern approaches to product Design and Development. | 05 |
| E | Advantages of Brainstorming | 05 |
| F | Product Architecture. | 05 |

Q2.

- | | | |
|---|---|----|
| A | Explain Customer Satisfaction with suitable example. | 05 |
| B | Discuss Quality Function Deployment (QFD). | 05 |
| C | What is a House of Quality? Explain its with diagram in detail. | 10 |

Q3.

- | | | |
|---|--|----|
| A | What are the methods of creative thinking? | 05 |
| B | Discuss Generation Concept. | 05 |
| C | Explain Pugh's Concept. | 10 |

Q4.

- | | | |
|---|--|----|
| A | Explain Gordon Technique. | 05 |
| B | What is Industrial Design? | 05 |
| C | Explain Design for Assembly in detail. | 10 |

Q5.

- | | | |
|---|---|----|
| A | Discuss Design for Environment | 05 |
| B | Describe Design for Serviceability. | 05 |
| C | What is mean by Human Factor in Design? | 10 |

Q 6.

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|---|--|----|
| A | Write about User Friendly Design. | 05 |
| B | Explain Design for Manufacturing. | 05 |
| C | Discuss guidelines of Design for Robustness. | 10 |



- 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 Write Short note on Quality Tool- Fishbone Diagram
 - c Short note on Operating Characteristic Curve (OC-Curve)
 - d List dimensions of quality
 - e Statistical quality control charts
 - f Write Short Note on Quality Function Deployment (QFD)

The Get-Well Hospital has completed a quality improvement project on the time to admit a patient using X-Bar and R-Charts. They now wish to monitor the activity using median and range charts. Determine the central line and control limits with latest data in minutes. As given below 10

Sub Group	X ₁	X ₂	X ₃	Sub Group	X ₁	X ₂	X ₃
1	6	5.7	6.2	13	6.1	6.9	7.4
2	5.4	6.3	6.8	14	6.2	5.2	6.8
3	5.6	5.8	5.2	15	4.9	6.6	6.6
4	5.1	5.7	6.5	16	7	6.4	6.1
5	6.8	6.5	5.5	17	5.4	6.5	6.7
6	5.7	5.2	5	18	6.6	7	6.8
7	5.5	5.1	5.2	19	4.7	6.2	7.1
8	6.1	5.8	6	20	6.7	5.4	6.7
9	5.6	4.9	5.7	21	6.8	6.5	5.2
10	4.4	6.4	6.3	22	5.9	6.4	6
11	6.3	6.9	5	23	6.7	6.3	4.6
12	6.6	7.1	6.2	24	7.4	6.8	6.3

- Q.2 a Describe Customer perception of Quality based on American Society for Quality) 10
- Q.3 a Explain the Total Quality Management implementation steps and tools involved in industries through technique of Six-Sigma 10
- b What are the criteria for performance excellence of Malcolm Baldrige national Quality Award? 10
- Q.4 a Explain Environmental management systems- ISO 14000 Series Standards, Integration of ISO 14000 with ISO 9000. 10
- b Describe Juran Quality gurus concepts of quality 10
- Q.5 a Describe the Bench Marking in the context of TQM 10
- b What is acceptance sampling plan? With OC curve mark and explain following 10
- i) Acceptance quality level(AQL) ii) Lot tolerance percent defective(LTPD) iii) Producer's risk iv) Consumer's risk
- Q.6 Explain any four of the following. 20
- (i) Short note on Cost of Quality (COQ) 5
 - (ii) Write short note on Taguchi Loss of Function 5
 - (iii) Customer Satisfaction model 5
 - (iv) Supplier Selection 5
 - (v) Information Technology tool role in TQM 5
 - (vi) Write short on TPM Concepts of 5S and KAIZEN 5

- 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

04/12/24

Q1. Solve any four

- A State the scope of composite materials in various sectors. 5
B Explain the stiffness and compliance matrix for Anisotropic and Isotropic materials. 5
C Write a short note on the Strength ratio 5
D Explain the Plain stress assumption for composite lamina 5
E Explain various criteria for composite repair works with suitable examples. 5
F Explain with figures the various levels of a generic repair design. 5

Q2.

- A Derive an expression for Hook's law for a 2D Unidirectional lamina. 10
B Explain with a neat diagram the working of the hand lay-up method for composite materials with its merits and demerits. 5
C Explain the concept of the powder metallurgy route for ceramic and metal matrix composites 5

Q3.

- A Differentiate between Vacuum Infusion and Resin Transfer Moulding techniques for composite manufacturing on the basis of diagram, set-up, operation, advantages, disadvantages, and applications. 10
B Write a short note on surface preparation for composites. 5
C Illustrate with neat figures the matrix cracks repair method in composites. 5

Q4.

- A Classify and briefly elaborate on various types of defects that may occur in composite parts. 10
B Illustrate with neat sketch the ultrasonic method of inspection for composites. 5
C Explain the laminates codes of $[0/-45/60/-45/0]$ and $[0/45/-30]$ s 5

Q5.

- A Differentiate between passive and active methods of thermography inspection based on principle, construction, working, advantages and disadvantages. 10
B Explain Tsai-Hill failure theory for 2D composite lamina 5
C Illustrate with a neat sketch of the spray lay-up technique for composite preparation 5

Q 6.

- A Derive an expression of failure criteria with a failure envelope according to Maximum Stress theory. 10
B Explain repair techniques for Delaminations in composites. 5
C Explain various types of laminates with their codes. 5

