Paper ID : 250470

Roll No:

BTECH
(SEM VI) THEORY EXAMINATION 2024-25
QUALITY CONTROL & RELIABILITY

TIME: 3 HRS **M.MARKS: 100**

Note: Attempt all Sections. In case of any missing data, choose suitably.

SECTION A

1. Attempt *all* questions in brief. **02 x 7 = 14**

Q no.	Question	CO	Level
a	Define quality. What are the major factors influencing quality?	CO1	K2
b	What is the cost of quality? Name its major components.	CO1	K1
c	Explain the use of X-bar and R-chart in quality control.	CO2	K3
d	What are the fundamental principles of TQM?	CO3	K2
e	Define reliability. What is MTTF?	CO4	K1
f	Distinguish between MTBF and MTTR.	CO4	K2
g	List any two reliability test methods.	CO5	K2

SECTION B

2. Attempt any *three* of the following: **07 x 3 = 21**

Q no.	Question	CO	Level
a	Explain the concept and benefits of quality circles.	CO1	K2
b	Discuss the construction and application of control charts for attributes.	CO2	K2
c	Please elaborate on the ISO 9000 standards and their role in quality improvement.	CO3	K3
d	Define hazard rate and failure density function. Explain their role in reliability estimation.	CO4	K2
e	Explain the temperature-humidity bias model in reliability management.	CO5	K4

SECTION C

3. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a	Discuss the types of quality and quality characteristics with examples.	CO1	K2
b	A company is facing frequent customer complaints about inconsistent product performance. As a quality assurance manager, propose a detailed plan integrating inspection procedures, statistical tools, and quality assurance techniques to identify and address root causes. Justify how each step in your plan supports overall quality improvement.	CO1	K5

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4. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a	A quality inspector takes 20 samples of 50 units each from a production process. Each sample contains an average of 2 defectives. Calculate the control limits for the p-chart.	CO2	K5
b	Explain the advantages and limitations of statistical quality control techniques.	CO2	K3

5. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a	Six Sigma is often seen as a powerful strategy for process improvement. Critically evaluate how Six Sigma integrates with Total Quality Management (TQM) principles. Design a Six Sigma DMAIC (Define, Measure, Analyse, Improve, Control) roadmap for reducing customer complaints in a manufacturing firm. Highlight the tools and metrics used in each phase.	CO3	K4
b	What is quality assurance? How is it different from quality control?	CO1	K2

6. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a	Explain the phases of a typical mortality curve and their relevance in reliability analysis.	CO4	K2
b	A component has a probability of failure of 0.1 in the first month. If it survives the first month, the likelihood of failing in the second month is 0.2. What is the probability that the component fails in the second month? (Use conditional probability).	CO4	K4

7. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question	CO	Level
a	Explain high temperature operating life acceleration model with suitable examples.	CO5	K3
b	Discuss accelerated reliability testing and its significance in product design.	CO5	K4