

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular/ Backlog), December 2018

B. Tech in Mechanical Engineering, Semester - VII

Roll No.....

ME 804: TQM

Time: 3 hours

Max. Marks: ~~100~~
80

Instructions to students:

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

Q.1	Objective type multiple choice questions (4 questions @ 2.5 mark)	4×2.5
i	Define TQM framework followed by neat sketch.	
ii	How benchmarking can be implement in manufacturing industry? Explain	
iii	How FMEA can be implement in manufacturing industry? Explain.	
iv	Describe the TQM benefits for manufacturing industry (Any 5)	
Q.2A	Define total quality management (TQM) and write down the short notes on Deeming Philosophy.	1+4
Q.2B	Define the Quality. Differentiate between X-bar-R-bar chart and p chart/C chart (Any 4).	1+4
Q.3A	What is ISO? Discuss the principle of ISO 9004:2000.	1+4
Q.3B	Discuss the importance of reliability for equipment life estimation. Differentiate between series reliability and parallel reliability.	2+3
Q.4A	Discuss the importance of orthogonal array design in Design of Experiment (DOE) using suitable example.	5
Q.4B	A module of a satellite monitoring system has 500 components in series. The reliability of each component is 0.999. Find the reliability of the module. If the number of components is reduced to 200, what is the reliability?	5
Q.5A	What is process capability? Explain the significance of R chart, nP-chart and U-chart in improving the productivity of the industry.	1+4
Q.5B	What is purpose of Quality Council? How employee involvement can be achieved in manufacturing organization?	2+3
Q.6A	Define the bench marking. Discuss the different phases of benchmarking in detail with the help of suitable example.	1+4
Q.6B	Define the reliability and reliability coefficient. Explain the bathtub curve with the help of suitable example.	2+3
Q.7A	Define the house of quality. Discuss the various steps involved in implantation	1+4

of HOQ in manufacturing industry with the help of suitable example.

Q.7B Why benchmarking should be used? Discuss the advantages and disadvantage of benchmarking. 1+4

OR

Q.7A What is Failure Mode and Effects Analysis? When should it be used by industry? Explain it with the help of suitable example. 1+4

Q.7B Why QFD should be used? Discuss the advantage and disadvantage of FMEA. 1+4

Q.8 In a capability study of CNC Turning machine, the mean diameter and ranges of diameters of a finished product from 10 samples each of size 5 are recorded as mentioned below. The specification limits for diameter of pipe are 200 ± 5 mm. 10

(a) Construct suitable chart and examine whether process is under control or not? And state your recommendation.

(b) Determine the process capability (6σ) of the CNC machine.

Sample	1	2	3	4	5	6	7	8	9	10
Mean	201	198	202	200	203	204	199	196	199	201
Range	5	0	7	3	4	7	2	8	5	6

Assume for $n = 5$, $A_2 = 0.577$, $D_3 = 0$, $D_4 = 2.115$

OR

Q.8 An automobile industry producing a piston ring in a bulk. The number of defective piston ring found in an inspection of 15 lots of 200 each, are 80. The lots are given 100% inspection, then 10

(a) Determine the trial control limit of suitable chart showing the number of defectives in each lot.

(b) Assume that all points fall within the control limits. What is your estimate of the process average fraction defective p' ?

(c) If this p' remains unchanged then what would be probability that 26th lot will contain exactly 7 defective?

(d) If this p' remains unchanged then what would be the probability that 26th lot will contain 7 or more defectives?