Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2022

Course: Total Quality Management **Semester: V**
Program: BBA-LM **Time : 03 hrs.**
Course Code: LSCM3004 **Max. Marks: 100**

Instructions:

SECTION A
10Qx2M=20Marks

S. No.		Marks	CO
Q1	Choose the incorrect statement regarding the need for quality. a) Markets have become more competitive b) Quality provides sustained performance c) Quality provides customer satisfaction d) It is the trend nowadays to introduce quality	**2 Marks**	**CO1**
Q2	Quality is fitness for use. Identify the quality guru who said this. a) Deming b) Crosby c) Juran d) Taguchi	**2 Marks**	**CO1**
Q3	It is important to know about _____ for quality planning. a) Customer needs b) Customer quality c) Customer satisfaction d) Manager satisfaction	**2 Marks**	**CO1**
Q4	Which of the following does not belong to the 'Define' activity in the DMAIC Model of Six Sigma? a) Determination of customer requirements b) Determination of CTQs c) Validating the measurements d) Mapping the process	**2 Marks**	**CO1**
Q5	The Six Sigma model used for improving the existing process/product is _____ a) DMAIC	**2 Marks**	**CO1**

	b) DMAAD c) DMADV d) DMAAX		
Q6	Which of the following from the 5S technique means ‘to separate out all unnecessary things and eliminate them’? a) Seiri b) Seiton c) Seiso d) Seiketsu	**2 Marks**	**CO1**
Q7	The control chart that determines the fraction of rejected parts as non-conforming is _____ a) R-chart b) S-chart c) P-chart d) C-chart	**2 Marks**	**CO1**
Q8	In which among the following is the Six Sigma process not applicable? a) Healthcare b) Business administration c) Selecting the best employee of the year d) Supply Chain	**2 Marks**	**CO1**
Q9	PDCA cycle is used for _____ a) Continuous improvement b) Discontinuous improvement c) Intermittent improvement d) Seldom improvement	**2 Marks**	**CO1**
Q10	Ryan works in a company that follows TQM and produces nuts and bolts. The company has not moved much from its old design of nuts and bolts. Ryan’s creativity leads him to a better and effective design of nuts and bolts at the same production cost as before. It can increase the productivity without compromising quality. Should the company implement Ryan’s design? a) Yes, everyone is recognized in a company which follows TQM b) No, everyone is not recognized in a company which follows TQM c) Design implementation is the responsibility of the design team only	**2 Marks**	**CO1**

<table>
<tr><td></td><td>d) Modern trends must not dominate and make the company lose its originality</td><td></td><td></td></tr>
<tr><td colspan="4">SECTION B
4Qx5M= 20 Marks</td></tr>
<tr><td>Q1</td><td>Describe the Juran’s Spiral of Progress in Quality.</td><td>5 Marks</td><td>CO2</td></tr>
<tr><td>Q2</td><td>Illustrate is the random and assignable variation in quality control.</td><td>5 Marks</td><td>CO2</td></tr>
<tr><td>Q3</td><td>Elucidate the roles and responsibilities in Six Sigma.</td><td>5 Marks</td><td>CO2</td></tr>
<tr><td>Q4</td><td>Explain the Taguchi’s Vs Traditional Approach of quality.</td><td>5 Marks</td><td>CO2</td></tr>
<tr><td colspan="4">SECTION-C
3Qx10M=30 Marks</td></tr>
<tr><td>Q1</td><td>Clarify Total Quality Management (TQM) and describes the eight principles of TQM.
or
Describes the Six-Sigma phases wise.</td><td>10 Marks</td><td>CO3</td></tr>
<tr><td>Q2</td><td>Determine the Quality Loss Function in details.</td><td>10 Marks</td><td>CO3</td></tr>
<tr><td>Q4</td><td>Explain the Quality Function Deployment?</td><td>10 Marks</td><td>CO3</td></tr>
<tr><td colspan="4">SECTION-D
2Qx15M= 30 Marks</td></tr>
<tr><td>Q1</td><td>Customer tolerances for the height of a steering mechanism are 1.5± 0.020 m. For a product that just exceeds these limits, the cost to the customer for getting fixed is Rs 50. Ten products are randomly selected and yield the following heights (in meters) : 1.53,1.49,1.50,1.49,1.48,1.52,1.54,1.53,1.51 and 1.52. Find the average loss per product item.

or

A factory manufacturing small bolts. To check the quality of the bolts, the manufacturer selected 20 samples of sample size 100 from the manufacturing process time to time. He/she visually inspected each selected bolt for certain defects. After the inspection, he/she obtained the following data:

<table><tr><th>Sample Number</th><th>Proportion Defective</th></tr><tr><td>1</td><td>0.10</td></tr><tr><td>2</td><td>0.04</td></tr><tr><td>3</td><td>0.08</td></tr><tr><td>4</td><td>0.15</td></tr></table></td><td>15 Marks</td><td>CO4</td></tr>
</table>

		5	0.08		
		6	0		
		7	0.01		
		8	0.05		
		9	0.05		
		10	0.08		
		11	0.10		
		12	0		
		13	0.06		
		14	0.05		
		15	0.03		
		16	0.20		
		17	0.05		
		18	0.07		
		19	0.01		
		20	0.08		

Q2

Calculate the 3σ control limits for X-bar and R charts based on the first 12 samples reflecting the process before any problems were denounced. Set up X-bar and R chart for these data.
Given data is:
A2 = 1.023
D3 = 0
D4 = 2.574

Sample	Screw 1	Screw 2	Screw 3
1	0.276	0.238	0.261
2	0.249	0.263	0.234
3	0.264	0.255	0.258
4	0.255	0.279	0.269
5	0.262	0.273	0.234
6	0.268	0.267	0.270
7	0.266	0.244	0.270

15 Marks **CO4**

8	0.232	0.261	0.278	
9	0.242	0.277	0.253	
10	0.246	0.253	0.236	
11	0.279	0.230	0.235	
12	0.238	0.243	0.237	