Name:	
Enrolment No:	**UPES**

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2019

Course: BBA (LM/AM)   Semester: VI
Subject: TQM   Subject code- LSCM3004
Max. Marks: 100   Time: 03 hrs.
Instructions:

SECTION A

S. No.	Attempt all of the following, each question carry two marks.		
Q 1	TQM	**2**	**CO 1**
Q 2	EMS	**2**	**CO 1**
Q 3	Benchmarking	**2**	**CO 1**
Q 4	Quality Assurance	**2**	**CO 1**
Q 5	Cause & Effect Diagram	**2**	**CO 1**
Q 6	QFD	**2**	**CO 1**
Q 7	JIT	**2**	**CO 1**
Q 8	Control charts	**2**	**CO 1**
Q 9	TPM	**2**	**CO 1**
Q 10	Capability Index	**2**	**CO 1**

SECTION B
Attempt any Four

Q 1	What does Total Quality Management encompass?	5	CO3
Q 2	What is ISO 14000?	5	CO2
Q 3	What is six sigma quality? How it can be implemented in logistics sector.	5	CO3
Q 4	What is Quality Loss Function? Discuss in details.	5	CO3
Q 5	Consider the capability of a process that puts pressurized grease in an aerosol can. The design specs call for an average of 70 pounds per square inch (psi) of pressure in each can with an upper tolerance limit of 75 psi and a lower tolerance limit of 65 psi. A sample is taken from production and it is found that the cans average 71 psi with a standard deviation of 2psi. Is the process capable at the 3σ level?	5	CO3

SECTION-C				
Attempt any three				
Q 1	A company produces bond paper and, at regular intervals, samples of 50 sheets of paper are inspected. Suppose 20 random samples of 50 sheets of paper each are taken during a certain period of time, with the following numbers of sheets in noncompliance per sample. Construct a p chart from these data.		**10**	**CO2**

Sample	n	Out of compliance
1	50	4
2	50	3
3	50	1
4	50	0
5	50	5
6	50	2
7	50	3
8	50	1
9	50	4
10	50	2
11	50	2
12	50	6
13	50	0
14	50	2
15	50	1
16	50	6
17	50	2
18	50	3
19	50	1
20	50	5

Q 2	What is ISO 9000? Describe the process for ISO 9000.			**10**	**CO3**
Q 3	What is Total Productive Maintenance? Describe the TPM process with reference to FMCG sector.			**10**	**CO3**
Q 4	What is SPC chart for quality management? How these charts can be use in service sector.			**10**	**CO4**
SECTION-D (Case study/Analytical)				

A manufacturing facility (ABC Ltd.) produces bearings. The diameter specified for the bearings is 5 millimeters. Every 10 minutes, six bearings are sampled and their diameters are measured and recorded. Twenty of these samples of six bearings are gathered. (Given for n= 6, A2 = 0.483)

Sample 1	5.13	4.92	5.01	4.88	5.05	4.97
Sample 2	4.96	4.98	4.95	4.96	5.01	4.89
Sample 3	5.21	4.87	5.02	5.08	5.12	5.04
Sample 4	5.02	5.09	4.99	5.02	5.03	5.01
Sample 5	5.12	5.08	5.09	5.13	5.06	5.13
Sample 6	4.98	5.02	4.97	4.99	4.98	4.99
Sample 7	4.99	5.00	5.00	5.02	5.01	5.01
Sample 8	4.96	5.01	5.02	5.05	5.04	5.02
Sample 9	4.96	5.00	4.91	4.87	4.96	5.01
Sample 10	5.03	4.99	4.96	5.14	5.11	5.04
Sample 11	4.91	4.93	5.04	5.00	4.90	4.82
Sample 12	4.97	4.91	5.02	4.93	4.95	4.96
Sample 13	5.09	4.96	5.05	5.12	5.06	5.01
Sample 14	4.96	4.99	4.82	5.03	5.00	4.96
Sample 15	4.99	4.97	5.01	4.98	4.96	5.02
Sample 16	5.01	5.04	5.09	5.07	5.12	5.13
Sample 17	5.05	4.97	5.04	5.03	5.09	5.01
Sample 18	4.96	4.93	4.97	5.01	4.98	4.92
Sample 19	4.90	4.85	5.02	5.01	4.88	4.86
Sample 20	5.04	5.03	4.97	4.99	5.05	5.06

		Marks	CO
Q 1	Help ABC Ltd. construct a x chart from these data.	10	CO4
Q 2	How does your chart show that the "diameter specified for the bearings" is out-of-control?	10	CO4
Q 3	What action do you recommend for ABC Ltd?	10	CO3

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Q 1	SPC	2	CO 1
Q 2	Six Sigma	2	CO 1
Q 3	Benchmarking	2	CO 1
Q 4	Quality Assurance	2	CO 1
Q 5	Benchmarking	2	CO 1
Q 6	QFD	2	CO 1
Q 7	Accuracy	2	CO 1
Q 8	UTL	2	CO 1
Q 9	TPM	2	CO 1
Q 10	Capability Index	2	CO 1

SECTION B
Attempt any Four

Q 1	What does Total Quality Management encompass?	5	CO3
Q 2	What is ISO 9000?	5	CO2
Q 3	What is six sigma quality? How it can be implemented in logistics sector.	5	CO3
Q 4	What is JIT system? Discuss in details.	5	CO3
Q 5	Consider the capability of a process that puts pressurized grease in an aerosol can. The design specs call for an average of 70 pounds per square inch (psi) of pressure in each can with an upper tolerance limit of 75 psi and a lower tolerance limit of 65 psi. A sample is taken from production and it is found that the cans average 71 psi with a standard deviation of 2psi. Is the process capable at the 3σ level?	5	CO3

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15	50	1
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