

Name:	
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2018

Course:	Total Quality Management (LSCM 8017)	Semester: III
Programme:	MBA General Management (Specialization – Operations)	
Time:	03 hrs.	Max. Marks: 100
Instructions:		

SECTION A **Marks 20**

S. No.		Marks	CO																				
Q 01	Fill the blanks with the most suitable word from the word-bank given below.																						
a	Quality solution approach to a problem is to restore the status quo and that for a chronic problem is to the status quo; the former is accomplished by a proper system of and, the latter is accomplished by taking a series of to accomplish the objective	1x4	CO 01 CO 03																				
b	To manage the sporadic and chronic quality problems leading to waste can effectively be dealt on a continuous basis by systematic Quality Planning for Quality and Quality – these three are otherwise known as or, Quality	1x4	CO 01 CO 03																				
c	The approaches and, the tools used in Total Quality Management can also be used for other parameters than waste, e.g., and, etc.	1x3	CO 01 CO 03																				
d	A proper of the process drawn at the appropriate should help to take two types of journeys viz., journey i.e. from symptoms to and, journey i.e. from cause to	1x6	CO 01 CO 03																				
e	Quality Gurus have often condensed the essence of Total Quality in a short and precise phrase. These wisdom statements are supplementary, they do not contradictory, they emphasis a particular aspect, as a result we have many profound insights into Total Quality. Some of them are – “Confirmation to Specification” it was proposed by “Predictable Degree of Uniformity” was proposed by and, “Loss to Society” proposed by	1x3	CO 01 CO 03																				
	<i>Please choose the word from below</i>																						
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SECTION B **02x20 = 40 Marks**

(DO ANY TWO OF QUESTIONS : Q 02, Q03 and Q 04)

Q 02	<p>a. Give simple, short, one-line definition of Quality Cost b. What are the sources of Quality Cost, discuss c. What is your observation on the annual quality cost data given below for a tire company? Give at least five distinct observations</p> <p style="text-align: center;">ANNUAL QUALITY COST : Mercury Tires Ltd., Dehradun</p> <p style="text-align: right;"><i>all figures in Rs.</i></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2" style="background-color: #e1eef6;">Cost of Quality Failures</th> <th colspan="2" style="background-color: #e1eef6;">Cost of Appraisal</th> </tr> </thead> <tbody> <tr> <td>Defective Stock</td> <td style="text-align: right;">3,276</td> <td>Incoming Inspection</td> <td style="text-align: right;">32,655</td> </tr> <tr> <td>Repairs and Rework</td> <td style="text-align: right;">73,229</td> <td>Process Inspection</td> <td style="text-align: right;">32,582</td> </tr> <tr> <td>Scrap Collection</td> <td style="text-align: right;">2,288</td> <td>Output Inspection</td> <td style="text-align: right;">25,200</td> </tr> <tr> <td>Scrap Generated</td> <td style="text-align: right;">187,428</td> <td>Spot Inspection</td> <td style="text-align: right;">65,910</td> </tr> <tr> <td>Consumer Adjustments</td> <td style="text-align: right;">408,200</td> <td>TOTAL</td> <td style="text-align: right;">147,347</td> </tr> <tr> <td>Downgrading and Seconds</td> <td style="text-align: right;">22,838</td> <th colspan="2" style="background-color: #e1eef6;">Cost of Prevention</th> </tr> <tr> <td>Customer Dissatisfaction</td> <td style="text-align: right;">NA</td> <td>Local Plant QC Dept.</td> <td style="text-align: right;">7,848</td> </tr> <tr> <td>Migration of Loyal Customers</td> <td style="text-align: right;">NA</td> <td>Corporate QC Dept.</td> <td style="text-align: right;">30,000</td> </tr> <tr> <td>TOTAL</td> <td style="text-align: right;">697,259</td> <td>TOTAL</td> <td style="text-align: right;">37,848</td> </tr> <tr> <td colspan="2" style="background-color: #e1eef6;">GRAND TOTAL</td> <td colspan="2" style="text-align: right;">882,454</td> </tr> </tbody> </table>	Cost of Quality Failures		Cost of Appraisal		Defective Stock	3,276	Incoming Inspection	32,655	Repairs and Rework	73,229	Process Inspection	32,582	Scrap Collection	2,288	Output Inspection	25,200	Scrap Generated	187,428	Spot Inspection	65,910	Consumer Adjustments	408,200	TOTAL	147,347	Downgrading and Seconds	22,838	Cost of Prevention		Customer Dissatisfaction	NA	Local Plant QC Dept.	7,848	Migration of Loyal Customers	NA	Corporate QC Dept.	30,000	TOTAL	697,259	TOTAL	37,848	GRAND TOTAL		882,454		05 05 10	CO 01 CO 03
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Q 03	<p>Discuss any two of the following; clearly write “Purpose”, “When to Use”, “How to Use”, “Benefits” and give “Example”</p> <p>a. Cause and Effect Analysis b. Process Capability c. Process Capability Index</p>	10 10 10	CO 01																																												
Q 04	<p>a. What is Pareto Priority Index? discuss b. Construct a Pareto Priority Index and rank the candidate projects based on the data given below c. Will you propose Management to go for the top ranking project or, use some qualitative criteria to consider along with the rankings; what are those criteria, discuss</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 20px;"> <thead> <tr> <th style="background-color: #e1eef6;">Project</th> <th style="background-color: #e1eef6;">Savings (Rs. in '000)</th> <th style="background-color: #e1eef6;">Probability of Success</th> <th style="background-color: #e1eef6;">Cost (Rs. in '000)</th> <th style="background-color: #e1eef6;">Project Completion Time (in Years)</th> </tr> </thead> <tbody> <tr> <td>A</td> <td style="text-align: center;">100</td> <td style="text-align: center;">0.7</td> <td style="text-align: center;">10.0</td> <td style="text-align: center;">2.00</td> </tr> <tr> <td>B</td> <td style="text-align: center;">50</td> <td style="text-align: center;">0.7</td> <td style="text-align: center;">2.0</td> <td style="text-align: center;">1.00</td> </tr> <tr> <td>C</td> <td style="text-align: center;">30</td> <td style="text-align: center;">0.8</td> <td style="text-align: center;">1.6</td> <td style="text-align: center;">0.25</td> </tr> <tr> <td>D</td> <td style="text-align: center;">10</td> <td style="text-align: center;">0.9</td> <td style="text-align: center;">0.5</td> <td style="text-align: center;">0.50</td> </tr> <tr> <td>E</td> <td style="text-align: center;">1.5</td> <td style="text-align: center;">0.6</td> <td style="text-align: center;">1.0</td> <td style="text-align: center;">0.10</td> </tr> </tbody> </table>	Project	Savings (Rs. in '000)	Probability of Success	Cost (Rs. in '000)	Project Completion Time (in Years)	A	100	0.7	10.0	2.00	B	50	0.7	2.0	1.00	C	30	0.8	1.6	0.25	D	10	0.9	0.5	0.50	E	1.5	0.6	1.0	0.10	05 05 10	CO 02														
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SECTION-C			
Q 05	<p>Based on case-let given below, answer the following questions</p> <ol style="list-style-type: none"> Discuss Big Q with reference to the case. Discuss the difference between cost cutting and cost erosion. Which were the four specific areas, identified by Mr. Prakash as part of cost-erosion initiatives. What were the benefits accruing to Tata Motors on implementing the cost-erosion exercise and the quality management project? <p>Caselet: Quality is King</p> <p>Company : Tata Motors, previously known as Tata Engineering & Locomotive Co. Ltd. (TELCO), is one of the largest companies in the Tata Group, and one of India's largest business houses. Tata Motors is India's leading commercial vehicle manufacturer and third largest passenger car manufacturer. The company is sixth largest truck manufacturer in the world. Tata Motors recently received the Balanced Scorecard Collaborative Hall of Fame Award for having achieved a significant turn-around of its overall performance. A comprehensive quality improvement and cost-cutting initiative in September 2000 has played an important role in the company's turnaround, from a of Rs. 500 million in the year ending March 2001 to a profit of Rs 28 million in the first quarter of 2002-2001. Tata Motors has two main business segments: Commercial Vehicle Business Unit (CVBU) and Passenger Car Business Unit (PCBU).</p> <p>The Cost of Success : The people at Tata Engineering do not fancy the phrase "cost cutting" for no other reason than that they see it as inadequate, even misleading in their context. "cost erosion" is a preferred terminology at India's largest automotive company, simply because it captures the breakthrough exercise that has saved more than Rs. 600 million off Tata Engineering's expenses over the last two years. The big positive of the cost erosion initiative goes beyond the statistics of money saved. It is going to be a permanent feature of Tata Engineering's agenda for the future. However, the problem is that the going gets tougher on this score with every passing month, because finding new costs to eliminate becomes ever more difficult.</p> <p>The cost erosion initiative, which began in in April 2000, is arguably the most important element in a remarkable revival that has seen Tata Engineering recover from a loss of Rs. 500 million in the year ended March 2001 to a profit of Rs. 28 million in the first quarter of 2002-2003. Prakash M. Telang, senior vice president (manufacturing), was designated the "cost-erosion champion" and put in charge of the entire initiative. Four specific areas were identified:</p> <ul style="list-style-type: none"> • Direct material cost; which constitute roughly 65% of all costs • Variable conversion cost viz., power, fuel, water, tools etc. • Fixed costs viz., labour, marketing, corporate expenses, plan operations, research & development • Financial structure viz., working capital, debt restructuring, balance sheet etc. 	<p>10</p> <p>10</p> <p>10</p> <p>10</p>	<p>CO 01</p> <p>CO 02</p> <p>CO 03</p>

Mr. Telang says, "Everybody had a cost erosion target built into his area of work and we saw a cascading effect take hold"

Three-tiered teams – members, leaders, champions – were put at the plant level to implement, drive and monitor the exercise across the organization. The task began with spreading the cost-reduction message, emphasizing its importance to bring the company back to good health, and defining the methods to accomplish it. The company union was co-opted to communicate the program and the house journal did the same.

Quality Management : Tata Motors started a comprehensive quality improvement initiative in September 2000. The initiative played an important role in the company's turnaround. Every year, about a quarter of Tata Motors' workforce went through training courses, which were rated highly in the Indian engineering industry.

The company's quality management project and its cost erosion exercise have run concurrently, and each has helped the other. For one, its people understood that cutting costs did not mean cutting corners. The same teams and the same people were involved in both exercises. This led to many win-win situations.

With operating margins in its flagship commercial vehicle operations now up at about 13 percent, Tata Engineering can afford to breathe easy. Where two years back it looked dark star, the future now promises the rewards of a war that seems well and truly won.

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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2018

Course: Total Quality Management

Semester: III

Programme: MBA General Management (Specialization – Operations)

Time: 03 hrs.

Max. Marks: 100

Instructions: Prof. Balaram Swamy J.

SECTION A

Marks 20

S. No		Marks	CO
Q 01	Fill the blanks for a and b with most suitable word from the word-bank given below.		
a	Quality solution approach to a problem is to restore the status quo and that for a chronic problem is to the status quo; the former is accomplished by a proper system of and, the latter is accomplished by taking a series of to accomplish the objective	1x4	CO 01 CO 03
b	The approaches and, the tools used in Total Quality Management can also be used for other parameters than waste, e.g., and, etc.	1x3	CO 01 CO 03
	WORD BANK :Please choose the word from below <i>Productivity Process Improvement Statistical quality control</i> <i>Sporadic cycle time Change safety</i>		
c	Match the Following	1x13	
	I Walter Shewart : Theory of Profound Knowledge II Appraisal : Correcting or replacing of products after shipment to the customer III W. Edward Deming : Quality Trilogy IV Prevention : Correcting or replacing of products that fail to confirm to specifications V Joseph Juran : Total Quality Control VI Internal Failure : All activities specifically designed to prevent defects VII Armand Feigenbaum : <i>Gemba</i> Kaizen VIII Philip Crosby : Poka-yoke IX Kaoru Ishikawa : Design of Experiments X Genichi Taguchi : Father of Quality Circles XI External Failure : Measuring and checking products to assure conformance to standards XII Shigeo Shingo : Four Absolutes of Quality XIII Masaaki Imai : Grand Father of Quality Control		CO 01 CO 03

SECTION B

02x20 = 40

Marks

(DO ANY TWO OF QUESTIONS : Q 02, Q03 and Q 04)

Q 02	<p>Cost of Poor Quality study conducted at an Orthopedic Implants Company in Jaipur found that, in the previous year the internal failure costs alone is more than Rs. 11.5 crores; break up is given below. Do Pareto Analysis and identify candidate quality improvement projects</p> <table border="1" data-bbox="365 535 1047 1312"> <thead> <tr> <th data-bbox="365 535 917 598">Cost Heads</th> <th data-bbox="917 535 1047 598">Amount in Rs.</th> </tr> </thead> <tbody> <tr> <td data-bbox="365 598 917 640">Design Changes</td> <td data-bbox="917 598 1047 640">333,000</td> </tr> <tr> <td data-bbox="365 640 917 682">Dispositions Scrap</td> <td data-bbox="917 640 1047 682">2,473,000</td> </tr> <tr> <td data-bbox="365 682 917 724">Downtime</td> <td data-bbox="917 682 1047 724">212,834</td> </tr> <tr> <td data-bbox="365 724 917 766">Excess Inventory Reserves</td> <td data-bbox="917 724 1047 766">36,253,810</td> </tr> <tr> <td data-bbox="365 766 917 808">Excess Inventory Reserves Carrying Cost</td> <td data-bbox="917 766 1047 808">5,075,533</td> </tr> <tr> <td data-bbox="365 808 917 850">Intermediate Stock Carrying Cost</td> <td data-bbox="917 808 1047 850">2,269,540</td> </tr> <tr> <td data-bbox="365 850 917 892">Intermediate Stock Inventory</td> <td data-bbox="917 850 1047 892">25,785,999</td> </tr> <tr> <td data-bbox="365 892 917 934">Investigation of Failure</td> <td data-bbox="917 892 1047 934">445,536</td> </tr> <tr> <td data-bbox="365 934 917 976">Obsolete Inventory Reserves</td> <td data-bbox="917 934 1047 976">11,552,776</td> </tr> <tr> <td data-bbox="365 976 917 1018">Obsolete Inventory Reserves Carrying Cost</td> <td data-bbox="917 976 1047 1018">1,617,389</td> </tr> <tr> <td data-bbox="365 1018 917 1060">Production Rework</td> <td data-bbox="917 1018 1047 1060">2,470,000</td> </tr> <tr> <td data-bbox="365 1060 917 1102">QC re-inspection indirect costs</td> <td data-bbox="917 1060 1047 1102">642,114</td> </tr> <tr> <td data-bbox="365 1102 917 1144">Safety Stock</td> <td data-bbox="917 1102 1047 1144">16,213,000</td> </tr> <tr> <td data-bbox="365 1144 917 1186">Safety Stock Carrying Cost</td> <td data-bbox="917 1144 1047 1186">3,610,040</td> </tr> <tr> <td data-bbox="365 1186 917 1228">Vendor Rework Charges</td> <td data-bbox="917 1186 1047 1228">115,000</td> </tr> <tr> <td data-bbox="365 1228 917 1312">TOTAL</td> <td data-bbox="917 1228 1047 1312">115,538,571</td> </tr> </tbody> </table>	Cost Heads	Amount in Rs.	Design Changes	333,000	Dispositions Scrap	2,473,000	Downtime	212,834	Excess Inventory Reserves	36,253,810	Excess Inventory Reserves Carrying Cost	5,075,533	Intermediate Stock Carrying Cost	2,269,540	Intermediate Stock Inventory	25,785,999	Investigation of Failure	445,536	Obsolete Inventory Reserves	11,552,776	Obsolete Inventory Reserves Carrying Cost	1,617,389	Production Rework	2,470,000	QC re-inspection indirect costs	642,114	Safety Stock	16,213,000	Safety Stock Carrying Cost	3,610,040	Vendor Rework Charges	115,000	TOTAL	115,538,571	20	CO 01
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Q 03	<p>Discuss any two of the following; clearly write "Purpose", "When to Use", "How to Use", "Benefits" and give "Example"</p> <p>a. Brain Storming</p> <p>b. Failure mode and effect analysis (FMEA)</p> <p>c. Error Proofing (Pokayoke)</p>	<p>10</p> <p>10</p> <p>10</p>	CO 02																																		
Q 04	<p>Reed engineering Ltd. Is a high-end industrial valve manufacturing company established about two decades ago. They manufacture a variety of valves to cater to specific needs of different industry verticals and segments. Over the years, several competitors entered the market and Reed is now facing tough competition. This forced Reed to take a closer look into operating costs and reduce it. You have been invited, as a consultant to help them to reduce it.</p>	20	CO 01																																		

You requested for the following cost data and the same was made available to you. Please analyse the data, give your recommendations in a report for the Reed Management to consider.

Quality Cost	Product A	Product B	Product C
Prevention	5,698	1,569	1,908
Appraisal	37,676	10,384	9,206
Internal Failure	119,107	60,876	63,523
External Failure	133,168	12,625	15,755
Total Sales	8,165,000	1,750,000	90,392
Total Labour Cost	5,800	5,650	4,585
No. of Machines	71	14	14

SECTION-C

Q
05

Based on case-let given below, answer the following questions

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- b. Discuss the difference between cost cutting and cost erosion.
- c. Which were the four specific areas, identified by Mr. Prakash as part of cost-erosion initiatives.
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10
10
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CO 01
CO 02
CO 03

Caselet: Quality is King

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