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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, DECEMBER 2017

Program/course: M.Tech (HSE & DM)

Subject: TQM & TPM

Code : MEEG 811

No. of page/3

Semester – III

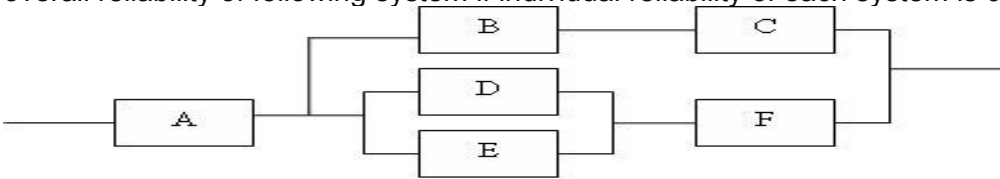
Max. Marks : 100

Duration : 3 Hrs

SECTION A

(ATTEMPT ANY FOUR QUESTIONS)

(5X4=20)

1.	How <b>Deming</b> approach of quality is different from <b>Crosby</b> concept of quality? Explain in context of TQM?	[5]	CO1
2.	What do you understand by process capability? What is importance of Process Capability index over Process capability? Write the formula for it and draw its table ? (1+2+2=5)	[5]	CO2
3.	The length of machine part is known to have a normal distribution with mean of 100mm and a standard deviation of 2mm? If the manger stipulate that no more than 5% of the part should be oversized, what specification limit should be recommended?	[5]	CO2
4.	What do you understand by the term Reliability ?.How it is related to MTBF? Find the overall reliability of following system if individual reliability of each system is 0.1? 	[5]	CO1
5.	Write the short notes on a) X-bar and R-control charts b) Pareto priority index	2.5x2=5	[5] CO3

SECTION B

ATTEMPT ANY FIVE QUESTIONS

5X10=50

6.	(a) Discuss the applications of control charts? Explain how P and c chart is different from X-bar and R control charts? (b)The Perfect Circle Company manufactures bushings. Once each hour a sample of 125 finished bushings is drawn from the output; each bushing is examined by a technician. Those which fail are classified as defective; the rest are satisfactory. Here are data on ten consecutive samples taken in one week:	[10]	CO3																														
	<table border="1" data-bbox="191 1732 1307 1900"> <tr> <td></td> <td>1</td> <td>2</td> <td>3</td> <td>4</td> <td>5</td> <td>6</td> <td>7</td> <td>8</td> <td>9</td> </tr> <tr> <td>Sample no.</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Defective</td> <td>15</td> <td>13</td> <td>16</td> <td>11</td> <td>13</td> <td>14</td> <td>20</td> <td>25</td> <td>30</td> </tr> </table>		1	2	3	4	5	6	7	8	9	Sample no.										Defective	15	13	16	11	13	14	20	25	30		
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Defective	15	13	16	11	13	14	20	25	30																								
	a. Plot the p-chart using above date and define lower control limit (LCL) and the upper control limit																																

	<p>b. Is this system under control?</p> <p>c. What should the quality control engineer do? <math>2+2+3=7</math></p>		
7.	<p>(a) With the help of suitable example, explain and draw FMEA? What is the difference between SEVERITY and OCCURANCE ? What is the advantage to measure RPN? <math>3+2+2=7</math></p> <p>(b) Write the short note on BENCHMARKING? 3</p>	[10]	CO2
8.	<p>(a) In an electric circuit, the capacitance of component should be between 25PF and 40PF . A sample of 25 component yield a mean of 30PF and standard deviation of 3PF. Calculate the process capability index Cpk and comment on the process performance. If the process is not capable then what proportion of product is non-conforming.(Assume normal distribution of characteristic) 6</p> <p>(b) Explain Taguchis definition of QUALITY? Write the formula of its Loss Function and explain it? 4</p>	[10]	CO2
9.	<p>When is the best time in the product development process to do QFD? What is the difference between "voice of the customer" (VOC) and customer needs? Draw a diagram of "standard QFD" and explain each block of it?</p>	[10]	CO4
10.	<p>Using flow chart explain DOUBLE SAMPLING PLAN? When does it applied? What is the importance of acceptance number in it? How can we decide its value? <math>3+2+2+3=10</math></p>	[10]	CO3
11	<p>Write the short notes on the following:-</p> <ol style="list-style-type: none"> <li>Mean Time Between Failure (MTBF)</li> <li><math>\alpha</math> and <math>\beta</math> risk in sampling</li> <li>Skewness and Kurtosis</li> <li>Six Big Losses in TPM</li> </ol> <p style="text-align: right;"><math>2.5 \times 4 = 10</math></p>	[10]	CO3
<p>SECTION C</p> <p>ATTEMPT ANY TWO QUESTIONS</p> <p><math>2 \times 15 = 30</math></p>			
12	<p>(a) Write all the clauses and sub-clauses of ISO 9000:2015 Quality Management System? Explain the steps invole in implementation of ISO system in any organization? 10</p> <p>(b) Explain the eight pillars of TPM? Draw Traditional Model of TPM?. <math>3+2=5</math></p>	[15]	CO5
13	<p>(a)The following contains hypothetical shift data of leading manufacturing unit. Using these inputs, calculate the % change in OEE if down time in below data is reduce 15 minutes and ideal cycle time is changed to 1 part every 50 secs.(Note Target Count is changed due to change in ideal cycle time)</p> <ol style="list-style-type: none"> <li>Shift Length (8 hours) 480 minutes</li> <li>Run Time 375 minutes</li> <li>Breaks 60 minutes</li> <li>Setup Time 15 minutes</li> <li>Down Time 30 minutes</li> <li>Total Time 420 minutes</li> <li>Ideal Cycle Time 1 part every 63 secs</li> <li>Total Count 360</li> <li>Good Count 355</li> </ol>	[15]	CO2

	<p>j) Target Counter 400 (10)</p> <p>(b) Explain Karl Pearson coefficient of co-relation formula? How its value is linked with scatter plot? <math>2+3=5</math></p>		
14	<p>Give the answer of following questions in context of attached case study “Continuous Improvement at TEXAS Instruments”</p> <p>a) Discuss the element that comprise TI strategic approach to Quality</p> <p>b) What measure are taken by DS &amp; E to conform to environmental guideline</p> <p>c) In the context of DEMINGS EXTENDED process, describe how TI incorporate its supplier in the journey to Quality management?</p> <p>5X3=15</p>	[15]	CO3