Name:	
Enrolment No:	**UPES**

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination
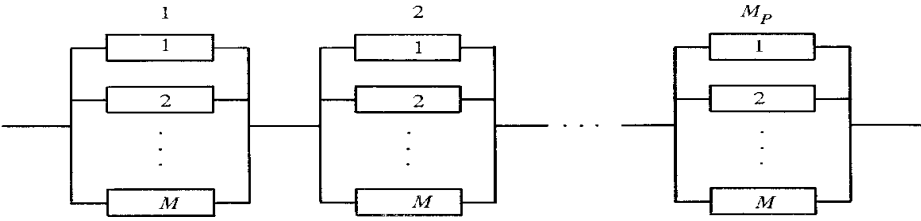
Course: TQM & TPM **Semester: III**
Programme: M-Tech (HSE/DM)

Time: 03 hrs. **Max. Marks: 100**
Instructions:ATTEMPT ALL QUESTION

SECTION A
5X4=20

		Marks	CO
Q 1	Write the steps of implementing TQM in an any organization? Consider the suitable example to explain it? (2+2=4)	4	CO1
Q-2	What is KAIZEN? Explain how it is beneficial for growth and development of any organization?	4	CO2
Q-3	What is BENCHMARKING? Explain it with the help of any example?	4	CO2
Q-4	Explain with a neat sketch the continuous improvement cycle?	4	CO2
Q-5	Write Short Notes On 1) Traditional Model of TPM 2) 8 Pillars of TPM (2+2=4)	4	CO5
	SECTION B (ATTEMPT ANY FOUR QUESTION) **4X10=40**		
Q-6	(a)What is the advantage of Cpk over Cp? How industries utilize process capability information to improve their processes? (b)In an electric circuit, the capacitance of the component should be between 24 and 40 pico farad (pf). A sample of 25 component yield a mean of 30pf and standard deviation of 3pf. Calculate Cp and Cpk? (5+5=10)	10	CO4
Q-7	(a)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? (b) In a normal distribution 37% of product are under 45 and 8% are over 64. Find mean and standard deviation of data. (5+5=10)	10	CO3
Q-8	(a) The data on magnets used in electric relay for 19 weeks was used to calculate control limits. The total number of magnet tested was 14091 and the total number found to be non-conforming was 1030. Find the control limits of P-chart.? (b)What is the difference in single and double sampling plan? What is β and α risk. (5+5=10)	10	CO2
Q-9	(a)What is the difference between SEVERITY, OCCURANCE and DETECTION in FMEA? How RPN is dependent on these factor. Draw suitable example to explain it? (b) A machine is used to fill soda bottles. The amount of soda dispensed into each bottle varies slightly. Suppose the amount of soda dispensed into the bottles	10	CO4

	is *normally distributed.* If at least 99% of the bottles must have between 585 and 595 milliliters of soda, find the value of maximum standard deviation that can be allowed? (7+3=10)		
Q-10	Write the short notes on the following a) Taguchi Index C_{pm} b) Fishbone Diagram c) JIT d) Zero Defect (2.5 x4=10)	**10**	**CO4**

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SECTION-C
(2X20=40)

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Q-11	(a) What is Overall Equipment Effectiveness (OEE)? Write the formula to calculate OEE? How should we select the area(s) on which to implement an OEE tool? (b)Explain 80-20 rule (Pareto Analysis)? What is the advantage of Pareto Priority Index (PPI) ? Explain it with the help of any example? **OR** (a) Define any one industrial problem of your own sector and explain how TPM is responsible for increase the profitability in that organization? Also write the steps of implementing TPM in that organization? (b) Write the formula of Karl Pearson coefficient of Correlation (R) ? Explain the significance of R. (10+10=20)	**20**	**CO5**
Q-12	Calculate the overall reliability of the series system of "M" parallel identical systems if each subsystem has an individual reliability is r ? Figure 1. Series system of parallel systems. (b) Write the clauses and sub clauses of ISO 9001:2015 Quality management System (QMS)? What is the advantage of implementing ISO quality standard in an any organization? (10+10=20)	**20**	**C04**