Name: **Enrolment No:**	UPES

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

Course: TQM & TPM **Semester: III**
Programme: M-Tech (HSE/DM) **Course Code:HSFS8001**
Time: 03 hrs. **Max. Marks: 100**
Instructions:ATTEMPT ALL QUESTION

SECTION A
4X5=30

		Marks	CO
Q 1	Define "Deming Cycle" and explain its role in quality improvement. Write the Demings's 14 points for management. (2+2=4)	**4**	**CO1**
Q-2	What is the difference between prevention and appraisal cost? What is the economic model of quality of non conformance? Draw the diagram to explain it. (2+2=4)	**4**	**CO2**
Q-3	(a)The length of machine part is known to have normal distribution with mean 100 mm and standard deviation 2mm.What proportion of the part will be between 98.5 and 102 mm? (4)	**4**	**CO4**
Q-4	(a) What do you understand by Skewness and Kutrosis? Write the formula for it? (2+2=4)	**4**	**CO3**
Q-5	Write Short Notes On (2+2=4)	**4**	**CO2**
	1)5-S		
	2) Kai-Zen		

SECTION B
4X10=40

Q-6	(a)What is role of QFD in development of organization? Draw a systematic diagram of each block of QFD and explain each section in it? (5) (b) What is the contribution of Taguchis to society? Explain its loss function? (5)	**10**	**CO4**
Q-7	1)Draw the normal distribution curve? Write the formula for it? What is the % of area comes under +/- 1σ,+/-2σ,+/-3σ respectively? (4) 2) In a distribution exactly normal,10.03% of item are under 25 Kg and 89.97% of the item are under 70 Kg. What are the mean and standard deviation of the distribution?(6)	**10**	**CO3**
Q-8	(a)What is difference between Quality and Reliability? Explain how reliability is related to MTBF and MTTR? Find the overall reliability of system if subsystem are in series and parallel ? (2+3=5)	**10**	**CO2**

	(b)From past experience, a manufacturer concludes that the burnout time of a particular light bulb follows a normal distribution.A sample of 50 bulbs has been tested and the average life found to be 60 days with a standard deviation of 20 days.how many bulbs in the entire population of light bulbs can be expected to be still working after 100 days of life? (5)		
Q-9	What is the advantage of Process Capability Index (Cpk) over Process capability (Cp). The relative humidity is expected to be between 65 and 85. Random sample taken over a span of one week yield the following data 60,78,70,84,81,80,85,60,88,75. Find and interpret the process capability index? (3+7=10) OR Write the short notes on the following a)Benchmarking b) Pareto Analysis c)Fishbone Diagram/Ishikawa Diagram d)Six big losses in TPM (2.5 x4=10)	**10**	**CO3**
	SECTION-C **(2X20=40)**		
Q-11	a) What do you understand by the term OEE? Explain each type of matric associated with it.? b) Using the real machine production data (given below) calculate OEE? **Machine Data Values** Shift Length (8 hours) 480 minutes Breaks (Planned) 60 minutes Setup Time 15 minutes Down Time 30 minutes Ideal Cycle Time 1 part every 63 secs Total Count 360 Good Count 355 Target Count 400 c) If downtime is reduced by 15 minutes (900 seconds) then find the % rise in value of OEE? (4+8+8=20)	**20**	**CO5**
Q-12	(a)A sample of 50 coils to be used in an electrical circuit is randomly selected and the resistance of each is measured. Calculate the Kurtosis Coefficient using following data $\Sigma(Xi-\mu)^2=727.9$, $\Sigma(Xi-\mu)^3=736$, $\mu=30.11$ (b)What is the industrial importance of FMEA? Draw FMEA as an example to calculate RPN? (c) What are the three components of the Juran Trilogy? Explain it in detail? (8+8+4=20)OR (a)A computer while calculating correlation coefficient between two variable X & Y from 25 pairs of observation obtained the following results N=25, $\Sigma X=125$,$\Sigma Y=100$, $\Sigma XY=508$, $\Sigma X^2=650$, $\Sigma Y^2=460$ It was, however, later discovered at the time of checking that he had copied down two pairs as	**20**	**CO4**

X	Y
6	14
9	6

While the correct values were

X	Y
8	12
6	8

Obtain the correct value of correlation coefficient

(b) Explain 8 pillars of TPM in details. What is the traditional model of TPM?

(12+ 8=20)