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

Course: B.Tech. ADE   Semester: V
Course: TQM   Time: 03 hrs.
Course code: ADEG 352   Max. Marks: 100
No. of pages: 2   Instructions:

SECTION A

S. No.		Marks	CO
Q1.	"JIT approach helps in waste elimination". Comment and support with proper reasons.	4	CO2
Q2.	Discuss obstacles associated with TQM implementation.	4	CO1
Q3.	Define FMEA. Write down its various stages.	4	CO3
Q4.	Discuss three conditions necessary to create the empowered environment.	4	CO2
Q5.	Discuss various dimensions of quality.	4	CO1

SECTION B

Q6.	a) Discuss various types of quality statements in detail. b) Differentiate between internal customer and external customer. **Or** a) Discuss the concept of Performance appraisal in detail along with various appraisal formats. b) List any 5 focus areas for Kaizen improvement.	7 3 7 3	CO2
Q7.	Discuss the objectives and steps to be followed for implementation of TPM. Also write different types of loss areas.	10	CO3
Q8.	Explain Taguchi's quality loss function. Draw the curve and write equation for each loss function.	10	CO3
Q9.	Discuss the potential benefits of registration with ISO 9000 and problems with its implementation.	10	CO4

SECTION-C

Q10.	a) Explain the reasons to benchmark and the process of benchmarking b) Discuss the concept and principles of QFD. Write down the steps and draw House of Quality.	7 13	CO3
Q11.	The number of processing errors per 100 purchase orders is monitored by a		CO3

company with the objective of eliminating such errors totally. Table below shows samples that were selected randomly from all purchase orders. The company is in the process of testing the effects of a new purchase order form that it has designed. The last five samples were made using the new form. Construct a control chart that the company can use for monitoring the quality characteristic selected. Also find the revised control limits if any. What is the effect of the newly designed purchase order form?

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Sample	Processing Errors	Sample	Processing Errors
1	6	14	3
2	4	15	6
3	2	16	1
4	3	17	5
5	4	18	2
6	7	19	6
7	5	20	4
8	7	21	2
9	11	22	3
10	4	23	2
11	2	24	1
12	5	25	2
13	4		

Or

The bore size on a component to be used in assembly is a critical dimension. Samples of size 4 are collected and the sample average diameter and range are calculated. After 25 samples, we have

$$\sum_{i=1}^{25} \overline{X}_i = 107.5 \qquad \sum_{i=1}^{25} R_i = 12.5$$

Data given: $D_3 = 0$; $D_4 = 2.282$; $A_2 = 0.729$; $d_2 = 2.059$

The specifications on the bore size are 4.4 ± 0.2 mm. The daily production rate is 1200.

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(a) Find the *X-bar* and R-chart control limits.

(b) Find the proportion of scrap and rework.

(c) If the process average shifts to 4.5 mm, what is the impact on the proportion of

scrap and rework produced?