Total No. of Questions : 4]

SEAT No. :

PA-10222

[Total No. of Pages : 2

[6010]-98

B.E (Mechanical Engineering) (Insem)

QUALITY AND RELIABILITY ENGINEERING

(2019 Pattern) (Semester - VIII) (402050A) (Elective - V)

Time : 1 Hour] *[Max. Marks : 30*

Instructions to the candidates:

1) ***Solve Q1 or Q2, Q3 or Q4.***
2) ***Figures to the right indicate full marks.***
3) ***Use of electronic calculator is allowed.***
3) ***Assume suitable data if necessary.***

Q1) a) Explain Deming's 14 quality principles. **[8]**

b) What is "5S System"? Explain 5S system methodology with example. **[7]**

OR

Q2) a) Explain the term & need in detail of "Quality Circle" and it's benefits. **[8]**

b) Elaborate term - ISO 14000 quality standard. **[7]**

Q3) a) Differentiate between control chart for Variable and Attribute data. **[5]**

b) Table given below shows the number of defectives found in inspection of 10 lots of 100 items each. **[10]**

i) Determine the control limits for P chart and state whether the process is in control.

ii) If the point which goes outside the control limit is analyzed and eliminated, What will be the value of new control and revised fraction defectives.

Lot no.	1	2	3	4	5	6	7	8	9	10
No. of Defectives	6	3	1	4	3	0	11	5	2	3

OR

P.T.O.

Q4) a) Define term "Sampling Inspection". Explain OC curve & its Characteristics. **[5]**

b) In automobile filling process, 500 ml. Of certain liquid was to be filled in bags. The permissible variation is ± 5 ml. For investigating the process capability, 5 bags were taken at random from each batch for 10 successive batches and results were plotted as follows : **[10]**

Batch	1	2	3	4	5	6	7	8	9	10
Mean (gm) $\overline{X}$	501	498	500	503	501	500	497	502	503	496
Range	3	4	2	4	3	5	4	2	6	4

Establish control chart limits for $\overline{X}$ and R charts. Plot the charts and interpret the meaning.

Take $A_2 = 0.58$, $D_3 = 0$, $D_4 = 2.11$. Will process be able to meet the specifications?

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