Total No. of Questions : 4]

SEAT No. :

PB-318

[Total No. of Pages : 2

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B.E. (Mechanical) (Insem)

QUALITY & RELIABILITY ENGINEERING

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

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

Instructions to the candidates:

1) ***Solve Q.1 or Q.2, Q.3 or Q.4.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data if necessary and mention it clearly.***

Q1) a) What is Pareto Principle? How it is used for analysis of Quality control Data? Explain with suitable example. **[7]**

b) State seven old Quality control tools. Explain *Ishikawa* diagram with suitable example. **[8]**

OR

Q2) a) Explain Appraisal, Prevention and Failure costs with suitable examples. **[7]**

b) State new seven quality tools and explain interrelationship diagram in detail. **[8]**

Q3) a) Calculate the process capability and show the six-sigma and specified tolerance on normal distribution curve and comment. Specification of item 500 ± 5, $n = 5$, $N = 20$, $A_2 = 0.58$, $D_3 = 0$, $D_4 = 2.11$. Plot appropriate charts and comment whether the process is in control or not? **[10]**

Batch	1	2	3	4	5	6	7	8	9	10
X bar	501	498	500	503	501	500	497	502	503	496
R	3	4	2	4	3	5	4	2	6	4

b) Explain double sampling plan with a neat flow chart. **[5]**

OR

P.T.O.

Q4) a) The table given below shows the number of defectives found in inspection of 10 lots of 100 items each. Choose and appropriate control chart and determine its control limits and state whether the process is in control or not? **[10]**

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

b) Draw an operating Characteristic curve and explain i) α risk, ii) β risk and iii) AOQ. **[5]**

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