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Roll No.

FIFTH SEMESTER

B.Tech

SUPPLEMENTARY EXAMINATION

FEB-2019

PE361 TOTAL QUALITY MANAGEMENT

Time: 3:00 Hours

Max. Marks: 50

Note: Answer any **FIVE** questions. Use of statistical tables is allowed. Assume suitable missing data, if any.

1. [a] What is quality cost? Explain different costs under quality cost. (5)
[b] How does a control chart help to control the quality of a product? Differentiate between chance causes and assignable causes of variation giving suitable examples. (5)
2. [a] Explain Operating characteristic curve and the related terminology. (5)
[b] Differentiate between variable and attribute type control charts. Explain the guidelines in implementing the control chart methodology. (5)
3. [a]. Explain Operating characteristic curve and the related terminology. (5)
[b] A double sampling plan is as follows:
 - i) Select a sample of 2 from a lot of 20. If both articles inspected are good, accept the lot. If both are defective, reject the lot. If 1 is good and 1 defective, take a sample of one article.
 - ii) If the article in the second sample is good, accept the lot. If it is defective reject the lot. If a lot 25% defective is submitted, what is the probability of acceptance? (5)
4. [a] Discuss evolution of quality management systems. How ISO system is different from Six Sigma methodology. (5)
[b] Explain methodology of six sigma for service industry. (5)
5. [a] The failure distribution of a component is defined by
$$f(t) = \frac{3t^2}{10^9}, \quad 0 \leq t \leq 1000 \text{ hr}$$
Find the median life and the design life for a reliability of 0.98. (5)

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- [b] A system is designed to operate for 110 days. The system consists of three components in series. Their failure distributions are:
- (i) Weibull with shape parameter 1.3 and scale parameter 850 days;
 - (ii) lognormal with shape parameter (s) 0.7 and median 435 days;
 - (iii) constant failure rate of 0.0001. Compute the system reliability. (5)
6. [a] Write a short note on Bath tub curve. (5)
- [b] Show that the low level redundancy has more reliability as compared high level redundancy. (5)
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7. Write short notes on **any two** of the following topics (2X5)
- [a] Rectifying inspection
 - [b] k-out-of-n redundancy
 - [c] Minimum effort method for reliability allocation
 - [d] Ishikawa diagram

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