(b) A component has the following linear hazard rate, where t is in years :

$\lambda(t) = 0.4\ t,\ t \geq 0$

(i) Find R(t) and determine the probability of component failing with in the first month of its operation.

(ii) What is design life if a reliability of 0.95 is desired ?

(2×5)

(c) (i) What do you mean by orthogonal array ? Explain its properties.

(ii) What is the concept of JIT ? Explain its genesis.

(iii) What do you mean by Six Sigma ? Explain how six sigma is different from TQM. **(10)**

5. Attempt any **four** parts of the following : **(5×4)**

Explain :

(i) MTTF and MTBF, with example.

(ii) Explain quality planning.

(iii) What do you mean by empowerment ? How does job enlargement and job enrichment improves quality ?

(iv) What is the role of value engineering in evaluating design to improve quality ?

(v) Explain continuous improvement and innovation.

(vi) Explain internal and external customers in relation to ISO 9000.

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2981 Roll No.

B.Tech.

(SEM. VII) THEORY EXAMINATION 2011-12

TOTAL QUALITY MANAGEMENT (TQM)

Time : 3 Hours *Total Marks : 100*

Note :– Attempt **all** questions. Marks allotted are indicated against every part of each question.

1. Attempt any **two** parts of the following :

(a) (i) Discuss the journey of quality program from "inspection and testing" era to today's most mordern era. **(7)**

(ii) Explain term "TQM". **(3)**

(b) (i) Enlist different methods to evaluate supplies. Explain any one in detail. **(6)**

(ii) Explain how to assess the quality in sales and services. **(4)**

(c) (i) What do you mean by capacity of a supplier ? What are the different measure to assess it ? **(3+4)**

(ii) What do you mean by warranty and guarantee ? How are they being analysed and set ? **(3)**

2. Attempt any **two** parts of the following :

(a) (i) What do you mean by quality loss function ? How does it explain the effect of quality and associated decisions on the life of common people as well as industrial personnel ? **(6)**

(ii) Working as an individual, determine different obstacles to implement TQM in a manufacturing organization. **(4)**

(b) What are different types of organizational structures ? Compare them on the basis of inventories, quality, production planning and control, set-up and throughput issues with suitable examples. **(10)**

(c) Discuss the different causes of operator errors and managerial approaches to overcome the same. **(10)**

3. Attempt any **two** parts of the following :

(a) (i) What do you mean by process capability index ? **(2)** The specification from the manufacturing of a particular type of metal coating call for the temperature of the drying oven to be $380 \pm 15°F$. The company that is considering using coating run tests by taking a large number of reading about mean temperature setting was found to be 2.06°F. What is the process capability index ? **(4)**

(ii) Explain different situation that may appear in a control chart while ploting data of samples on control limits. **(4)**

(b) (i) Show relationship between sample and population. Also explain how this relation help us to develop control charts. **(4)**

(ii) What are α and β in relation to type I and type II error ? **(3)**

(iii) Standard deviation for three samples are 9.6, 10.2, 9.8. If all these three samples are drawn as single sample, what will be the standard deviation ? **(3)**

(c) The following table gives the average and range in Kg^0 for tensile tests on an improved plastic cord. The subgroup size is 4. Determine the trial control limits. If points are out of control, assume assignable causes and calculate revised limits and central line.

Subgroup Number	$\overline{X}$	R	Subgroup Number	$\overline{X}$	R
1	476	32	14	482	22
2	466	24	15	506	23
3	484	32	16	496	23
4	466	26	17	478	25
5	470	24	18	484	24
6	494	24	19	506	23
7	486	28	20	476	25
8	496	23	21	485	29
9	488	24	22	490	25
10	482	26	23	463	22
11	498	25	24	469	27
12	464	24	25	474	22
13	484	24			

(10)

4. Attempt any **two** parts of the following :

(a) Explain :

(i) Fault isolation and self diagnostics;

(ii) Parts standardization and interchangeability;

(iii) Modularization and accessibility ; and

(iv) Repair and /or replacement. **(2.5×4)**