Exam Date & Time: 15-Jan-2024 (02:30 PM - 05:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SEVENTH SEMESTER B.TECH END SEMESTER MAKEUP EXAMINATIONS, JAN 2024

TOTAL QUALITY MANAGEMENT [MME 4087]

Marks: 50 **Duration: 180 mins.**

A

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

1) Describe the nine dimensions of quality with reference to any product. (2)

A)

B) What is meant by Empowerment? Discuss the three conditions necessary to create empowered environment in an organization. (3)

C) Following table represents the grouped frequency distribution of certain measured quality characteristic. Find the Sample average and Median of this distribution. What percentage of actual distribution falls outside the limits 7.5 cm and 19.5 cm? (5)

Cell boundaries (cm)	Frequency
2.5-4.5	3
4.5-6.5	8
6.5-8.5	15
8.5-10.5	20
10.5-12.5	25
12.5-14.5	42
14.5-16.5	35
16.5-18.5	28
18.5-20.5	14
20.5-22.5	6
22.5-24.5	3

2) Sketch and explain Check sheets with an example. (3)

A)

B) Discuss any six core values and concepts with regard to a business organization. (3)

C) Describe the TPM technique. How the areas of needed improvements are identified in TPM? (4)

3) Discuss the ISO 9000 series of standards. Explain the Registration phase in the implementation of Quality Management System. (3)

A)

B) Sketch and explain the three graphic representation methods of frequency distribution. (3)

C) (4)

A process has demonstrated that when held in control it can maintain a σ of 0.18 cm. A certain part has specifications of 20 ± 0.5cm.

(i) Using a target mean of 20 cm find control limits for $\bar{X}$ and R charts based on a subgroup size of 5 units.

In answering the following questions, assume that the actual mean setting μ is 19.86 cm.

(ii) What is the probability of Type II error with regard to $\bar{X}$ chart?

(iii) What is the value of Process capability index C_{pk}?

4) What is Kaizen? Discuss any eight techniques used for Kaizen improvement with reference to a product industry. (3)

A)

B) How the control charts are classified? Describe the theory of extreme runs of points. (3)

C) Describe the construction and use of *s* chart and *u* chart. (4)

5) Discuss the reasons for using Benchmarking tool. Explain the following steps in the implementation of Benchmarking: (i) Studying others (ii) Leaning from the data (4)

A)

B) Discuss Taguchi's three quality loss functions with examples. (3)

C)

The following table gives the number of missing rivets noted at aircraft final inspection:

Airplane number	Number of missing rivets	Airplane number	Number of missing rivets
1	8	14	25
2	16	15	15
3	14	16	9
4	19	17	9
5	11	18	14
6	15	19	11
7	8	20	9
8	11	21	10
9	21	22	22
10	12	23	7
11	23	24	28
12	16	25	9
13	9		

Find the central line and control limits for a *c* chart. What value of c_0 and control limits would you suggest for future use? (3)

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