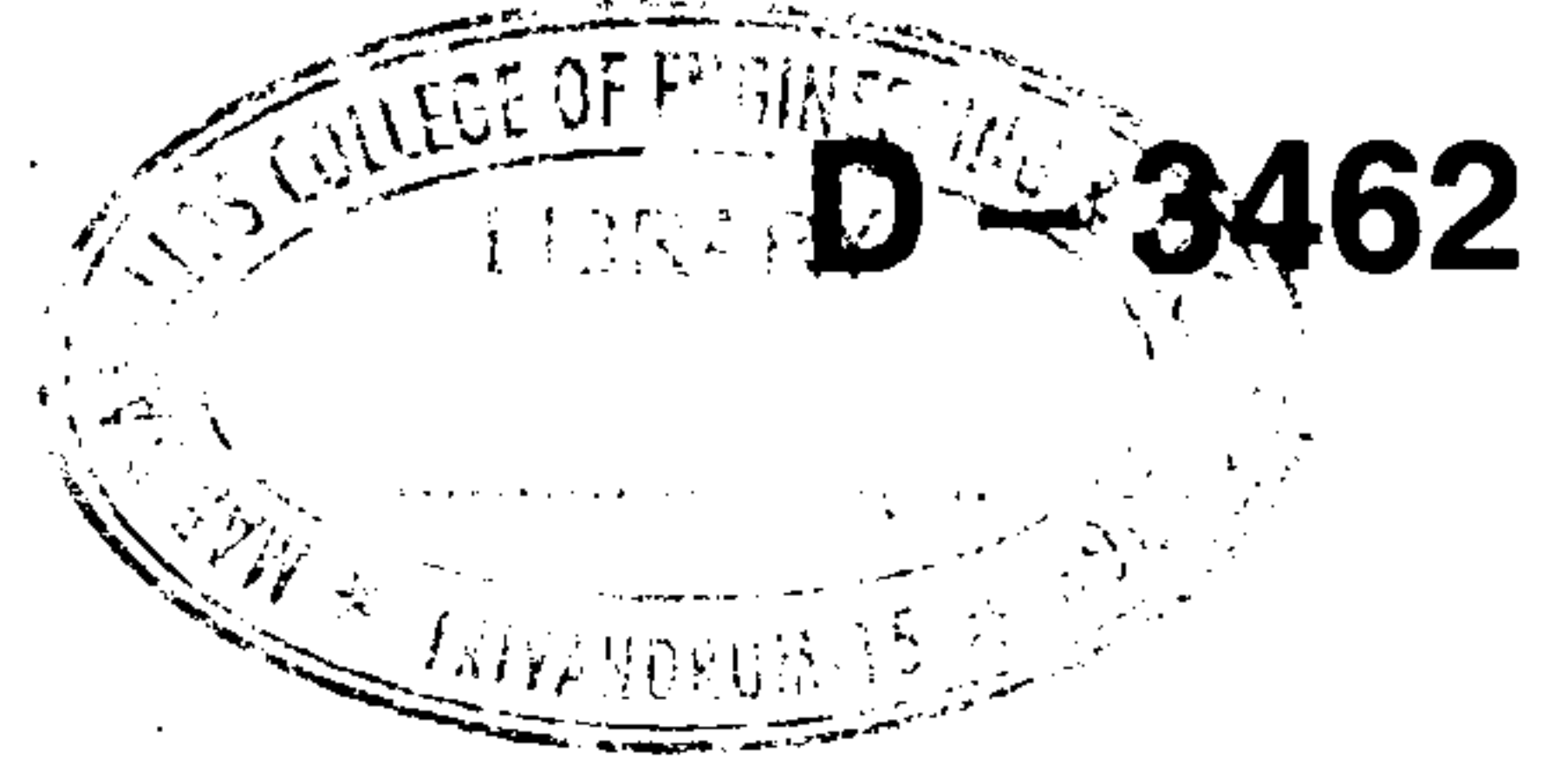




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Reg. No. :

Name :

**Eighth Semester B.Tech. Degree Examination, December 2017
(2008 Scheme)
08.806.3 : INDUSTRIAL QUALITY CONTROL (MPU)**

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. **Each** question carries **4** marks.

1. Name the various methods of calculating process capability. Explain why “range method” is preferred for process capability analysis.
2. Distinguish between P chart and C chart.
3. Describe in detail about quality assurance.
4. State the uses of \bar{X} and R charts.
5. Differentiate between single sampling plan and double sampling plan.
6. State and explain the advantages and limitations of acceptance sampling over 100% inspection.
7. Explain the characteristics of OC curve.
8. Differentiate between reliability and availability.
9. Discuss about the product development.
10. What is Weibull distribution ? **(10×4=40 Marks)**

PART – B

Answer **any one** question from **each** Module. **Each** question carries **20** marks.

Module – I

11. A soft drink company is interested in controlling its filling operation. Random samples of size 4 are selected and the full weight is recorded. Table below

P.T.O.



shows the data for 12 samples. The specification on fill weight is 350 ± 5 g. Daily production rate is 20,000 bottles.

Sample	Observation in grams			
	I	II	III	IV
1	352	350	351	348
2	356	351	349	352
3	353	348	351	350
4	353	354	350	352
5	351	348	347	348
6	353	348	347	352
7	346	348	347	346
8	351	348	347	349
9	348	352	351	352
10	356	351	351	350
11	352	348	347	349
12	348	347	351	352

- i) Find the trial control limits for \bar{X} and R charts.
- ii) Assuming special causes for out-of-control points, find the revised control points.

(20)

OR



12. a) A spindle with specifications 30 ± 0.02 mm was machined in a lathe. The standard deviation of the spindle machined was found to be 0.006 mm. Compute the capability index. State whether the machining process in lathe is capable of meeting the specifications. 10

b) The following table refers to the average number of outlet leaks per radiator for 10 lots of 100 radiator each.

Lot No	Number of leaks
1	15
2	17
3	12
4	16
5	14
6	5
7	14
8	11
9	9
10	10

Establish U chart for the future production. 10

Module – II

13. a) A single sampling plan uses a sample size of 15 and an acceptance number 1. Using hyper geometric probabilities compute the probability of acceptance of lots of 50 articles 2% defective. 10

b) Explain the OC curve with reference to the following : 10

i) AQL

ii) LTPD



- iii) IQL
- iv) Producer's risk
- v) Consumer's risk.

OR

14. a) In a double sampling plan, $N = 5000$, $n_1 = 100$, $c_1 = 0$, $n_2 = 100$ and $c_2 = 1$ **10**
- i) Use Poisson's table to compute the probability of acceptance of a 1% defective lot.
 - ii) Assume that a lot rejected by this sampling plan will be 100% inspected, what will be the AOQ if the submitted product is 1% defective ?
- b) Write short note on the following : **10**
- i) Single sampling plan
 - ii) Double sampling plan
 - iii) Sequential sampling plan.
 - iv) Multiple sampling plan.

Module – III

15. a) A certain type of electronic component has a uniform failure rate of 0.00001 per hour. What is its reliability for a specified period of service of 10,000 hours ? **10**
- b) What do you mean by reliability ? Discuss the various methods of improving reliability. **10**

OR

16. a) Explain with the neat sketch the various stages in product life cycle. **10**
- b) What is redundancy ? Describe the method which is used to solve the redundancy optimization problem. **10**

(3×20=60 Marks)
