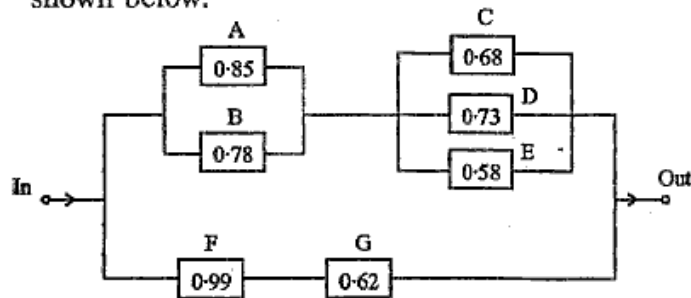


- (b) A system consists of seven elements connected as shown below. 10



Calculate overall reliability of system.

Total No. of Questions : 10 ] [ Total No. of Printed Pages : 4

Roll No. ....

## ME-8303

B. E. (Eighth Semester) EXAMINATION, June, 2010

(Mechanical Engg. Branch)

QUALITY CONTROL AND RELIABILITY

(Elective—III)

(ME-8303)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt one question from each Unit.

### Unit—I

1. (a) Explain the term "Quality Assurance Function" and state the advantages of quality assurance. 10
- (b) Explain the various types of sampling plans which are in practice in industry with their respective acceptance criteria. 10

Or

2. (a) Explain the various sampling methods. 10
- (b) Draw a neat sketch of an OC curve showing its different zones and explain the meaning of different related terms. 10

### Unit—II

3. (a) Plot the control charts for  $\bar{X}$  and R, using the sample data ahead and a sample size of five. From the chart found out whether the process is in control : 10

P. T. O.

Sample No.	$\bar{X}$	R
1	5.004	0.02
2	5.20	0.08
3	5.01	0.03
4	5.008	0.05
5	5.009	0.04
6	5.016	0.09
7	5.03	0.04
8	5.01	0.04
9	5.016	0.05
10	5.01	0.07

- (b) What do you understand by "Design of Experiments" in the context of quality characteristics ? Explain. 10

Or

4. (a) The following are the inspection results of 20 lots of magnets, each lot of 75 magnets. Number of defective magnets in each lot are :

48	45	37	47	53
83	56	52	57	34
70	78	47	51	29
85	67	50	71	30

Draw the  $p$  chart and state whether the process is in control. 10

- (b) Name special methods of "Design of Experiments" for process evaluation and control. Explain ROBUST designs. 10

### Unit-III

5. What do you understand by Process Capability ? Give an account of the methods of calculating process capability.

Show the possible relationship of a process in control to upper and lower specification limits. 20

Or

6. What is the object of doing process capability analysis ? What are the different indices used in process capability studies ? Explain the process capability index and process performance index. 20

### Unit-IV

7. (a) What are the principles of TQM ? What is the relationship of TQM and quality management system ? 10

- (b) Explain Quality Policy Deployment. 10

Or

8. (a) Write about Kaizen. How Kaizen concept can be implemented in an organization ? 10  
(b) What is ISO ? What is ISO 9000 quality system ? What is the difference between ISO 9000 and TQM ? 10

### Unit-V

9. (a) A unit has reliability of 0.99 for a specified mission time. If two identical units are used in series system and also in parallel system, which one has a higher reliability ? 10  
(b) Write short notes on the following : 10  
(i) Maintainability  
(ii) Availability  
(iii) Fault Tree

Or

10. (a) Explain Total Productivity Maintenance. 10