PARUL UNIVERSITY
FACULTY OF ENGINEERING & TECHNOLOGY
M.Tech., Winter 2016-17 Examination

Semester: 1   Date: 30/12/2017
Subject Code: 03208103   Time: 02:00PM to 04:30PM
Subject Name: Quality Engineering and Management   Total Marks: 60

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 A) Define the term quality control & explain its objectives? **(05)**

B) Explain the concept of FOCUS manufacturing. **(05)**

C) What is sustainable manufacturing and sustainable products? Which factors are considered to implement the sustainable manufacturing? **(05)**

Q.2 **Answer the following questions**. (Attempt any three) (Each five mark) **(15)**

A) What is green supply chain management? Explain different areas of green Supply Chain management?

B) Briefly explain the bathtub curve with diagram?

C) What is ANOVA analysis? Explain the different terms involved in ANOVA.

D) Explain the concept of design of experiments? State the advantages of DOE.

Q.3 A) Write the importance of sampling. What are different types of sampling plan? Explain the sampling procedure with the help of examples. **(07)**

B) Following are the readings of diameters taken for pins manufactured on the lathe machine. Draw X-bar and R chart for the given data and state whether the process is in control. (Given: A2=.577, D3=0, D4=2.114) **(08)**

Sample	1	2	3	4	5
1	5.02	5.01	4.94	4.99	4.96
2	5.01	5.03	5.07	4.95	4.96
3	4.99	5.00	4.93	4.92	4.99
4	5.03	4.91	5.01	4.98	4.89
5	4.95	4.92	5.03	5.05	5.01
6	4.97	5.06	5.06	4.96	5.03
7	5.05	5.01	5.10	4.96	4.99
8	5.09	5.10	5.00	4.99	5.08
9	5.14	5.10	4.99	5.08	5.09
10	5.01	4.98	5.08	5.07	4.99

OR

B) What is Cause & effect diagram? Make the cause and effect analysis of poor surface finish occurring after turning in a lathe machine? **(08)**

Q.4 A) Consider 5 specimens of an electric heater. Calculate the mean failure rate and the mean time to failure (MTTF) for the entire five specimens. **(07)**

Component number	Time to failure (hrs.)
1	400
2	470
3	530
4	580
5	600

OR

A) The lot size N is 2,000 in a certain AOQL inspection procedure. The desired AOQL of 2% can **(07)** be obtained with any one of the three sampling plans. These are:

    1) n = 65 , c=2
    2) n = 41 , c=1
    3) n = 18 , c=0

If a large number of lots 0.3% defective are submitted for acceptance, what will be the average number of units inspected per lot under each of these sampling plans?

B) Explain the following terms. **(08)**

    1) Severity
    2) Detection
    3) Occurrence
    4) Risk priority number (RPN)
    5) Sensors
    6) Affinity diagram
    7) Adaptive control system
    8) AOQL