

**Instructions to candidates.**

**Duration:** 02 Hours

**Number of questions:** Four (04) Essay Questions

**Mark allocation:** 100 mark

**Answer All Questions.**

- 1.
- a) Define the term "Quality". (05 mark)
  - b) Compare and contrast the followings:
    - i. Quality control Vs Quality Assurance
    - ii. ISO 9001 vs ISO 14001
    - iii. Manufacturing quality Vs Service quality
    - iv. Push and Pull systems(20 mark)
- 2.
- a) Critically discuss on David Garvin's Product Quality Dimensions. (10 mark)
  - b) Briefly explain the costs of quality. (08 mark)
  - c) You have given a task to implement 5S in your company. Discuss in detail the procedure which you are going to follow. (10 mark)
- 3.
- a) Briefly discuss the mechanism of quality control. Give appropriate examples where necessary. (07 mark)
  - b) What are the types of Control Charts (discuss two main types with their branches)? (07 mark)
  - c) Describe the concept of Six Sigma quality. Why such a high quality level is important? (06 mark)
  - d) When should we change the control limits? (07 mark)



4. A pen manufacturing company wanted to know whether the process of filling 15 ml of ink in a refill is under control or not. To draw conclusion the quality control department drew 10 samples of size 5 each in an interval of one hour. The data collected is as follows:

Sample Number	X1	X2	X3	X4	X5
1	14.89	14.87	13.98	14.99	14.67
2	13.89	13.56	14.23	14.38	13.78
3	13.89	13.45	13.89	13.97	14.98
4	14.65	14.98	15.02	15.21	13.67
5	14.87	15.23	15.11	14.34	13.99
6	15.00	15.32	14.23	13.78	13.99
7	13.78	14.76	14.45	15.00	15.12
8	14.99	15.02	15.00	14.99	13.89
9	14.23	15.00	15.11	13.98	14.67
10	15.00	15.01	15.12	14.99	14.98

- a) Draw the appropriate control charts. (15 mark)
- b) What are the conclusions you could make about this process? (05 mark)