

**B.TECH. SEM -V PRODUCTION 2014 COURSE (CBCS) : WINTER -  
2017**

**SUBJECT: METROLOGY AND QUALITY CONTROL**

Day: Tuesday  
Date: 16/01/2018

Time: 02.30 PM TO 05.30 PM  
Max. Marks: 60

**W-2017-2164**

**N.B:**

- 1) All questions are **COMUPLSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of non-programmable **CALCULATOR** is allowed.
- 4) Draw neat and labeled diagram **WHEREVER** necessary.

**Q.1** Explain the angle measurement procedure for component having taper on one side? (10)

**OR**

**Q.1** Discuss with neat sketch the working of Autocollimator. (10)

**Q.2 a)** Explain the following: (06)

- i) Flatness                      ii) Parallelism                      iii) Squareness

**b)** Discuss with neat sketch the Ring gauge ? Explain the Taylors Principle? (04)

**OR**

**Q.2** Classify the comparators. Explain with neat sketch the sigma comparator? (10)

**Q.3 a)** Explain with neat sketch the Tomlinson surface meter. (06)

**b)** Discuss with neat sketch the working of Profile Projector. (04)

**OR**

**Q.3** Calculate the effective diameter for M 24 x 3mm plug gauge by using floating carriage micrometer for which readings were taken as below. (10)

- i) Diameter of standard cylinder 22.001 mm.
- ii) Micrometer reading over stranded cylinder with two wire of same diameter was 12.9334 mm.
- iii) Micrometer reading over the plug screw gauge and wire was 12.1124 mm.

Best wire was used for above measurement. Neglect rate and compression errors.

**Q.4** In automobile filling process 500 gms of certain liquid was to be filled in bags (10) the permissible variation is  $\pm 5$  gms. For investigating the process capability, 5 bags were taken at random from each batch for 10 successive batches and results were plotted as follows.

Batch	1	2	3	4	5	6	7	8	9	10
Mean gms.	501	498	500	503	501	500	497	502	503	496
Rang	3	4	2	4	3	5	4	2	6	4

Establish control chart limits for  $\bar{X}$  and R chart and draw the charts.  
Taken  $A_2 = 0.58$ ,  $D_3 = 0$ ,  $D_4 = 2.11$ . State whether the process will be able to meet the specifications.

**P.T.O.**

**OR**

**Q.4 a)** Explain in detail the concept of Quality circle? **(06)**

**b)** Discuss in detail 100% Inspection and sampling Inspection. **(04)**

**Q.5 a)** Explain with neat sketch Quality Function Deployment? **(06)**

**b)** Explain the concept of Design of Experiment? **(04)**

**OR**

**Q.5 a)** Explain with neat sketch. **(06)**

i) Cause and effect diagram.

ii) Pareto Analysis

**b)** Explain with neat sketch the bath tub curve. **(04)**

**Q.6** Discuss in detail the quality system documentation. **(10)**

**OR**

**Q.6** What is ISO 14001 and discuss its requirements. **(10)**

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