

**B.Tech. – VIEP – MECHANICAL ENGINEERING
(BTMEVI)****Term-End Examination****December, 2015****BIME-019 : METROLOGY***Time : 3 hours**Maximum Marks : 70*

Note : Attempt any *five* questions. All questions carry equal marks. Use of scientific calculator is permitted.

1. (a) Discuss 'Metrology' as a means to achieve quality control.
- (b) What are the systems of specifying tolerances ? Which system is used most and why ? Explain. 7+7

2. (a) Define the terms 'Precision' and 'Accuracy' and describe the methods to achieve them.
- (b) Explain the construction, working and features of a vernier height gauge with the help of a neat sketch. 7+7

3. (a) Write down the precautions which should be taken while using a micrometer.
- (b) Describe the working principle of a vernier caliper with the help of a neat sketch. How is it read ? Describe. 7+7
4. (a) Explain any *two* of the following instruments with the help of neat diagrams :
- (i) Vernier bevel protractor
- (ii) Dial bevel protractor
- (iii) Optical bevel protractor
- (b) Sketch various forms of sine bars and explain any one of them in detail. Enumerate the uses of sine bars. 7+7
5. (a) What is a clinometer ? Name different types of commonly used clinometers.
- (b) Enumerate the points which should be given due consideration while giving specifications of a screw thread. 7+7
6. (a) Explain briefly 'Thread micrometer method' of measuring effective diameter of a screw thread.
- (b) Why are tolerances provided on dimensions of the components ? Explain each type of fit with suitable examples. 7+7

7. (a) What are the instruments used for measuring flatness or small differences in length ? Describe one such instrument with the help of a neat sketch.

(b) A steel shaft is made within limits on its diameter of 60.02 mm and 59.96 mm. State the upper and lower limits of the bore size of a bush to give a maximum clearance of 0.10 mm and a minimum clearance of 0.02 mm.

7+7
