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DIPLOMA VIEP MECHANICAL ENGINEERING

Term-End Examination

June, 2013

BIME-027 : METROLOGY AND QUALITY CONTROL

Time : 2 hours *Maximum Marks : 70*

Note : *Attempt **any five** questions. Each question carries equal marks. Assume missing data if any.*

1. (a) Briefly discuss about various types of fits used for the purpose of assembly of machine parts. 7

   (b) Explain Hole basis system and Shaft basis system. 7

2. (a) What is meant by the term flatness as applied to metrology ? Differentiate between flatness interferometer and length interferometer. 7

   (b) How will you measure diameter of a cylindrical plug gauge with the help of a given standard slip gauge and an optical flat ? 7

3. (a) Explain the principles of pneumatic gauging by the back pressure system and state the range of pressures over which it is normally used. 7

(b) What is a comparator ? Classify the different types of comparators. 7

4. (a) Why is the assessment of surface texture important ? Describe any two methods for obtaining a numerical value of the texture from a given graphical record. 7

(b) Define the following with respect to surface finish assessment : 7

(i) Roughness

(ii) Waviness

(iii) Lay

(iv) Sampling length

5. (a) Define the term quality control and explain its advantages over inspection techniques. 7

(b) What is the concept of quality circle ? Describe the basic organisation structure of quality circle. 7

6. (a) Explain the term "Quality Assurance Function". State the advantages of quality assurance. 7

(b) Define TQM. State the important requirement for the implementation of TQM programme in an industrial organisation. 7

7. (a) Differentiate between chance causes and Assignable causes of variation. State the objectives of $\overline{X}$ and R charts. 7

(b) Explain the double sampling plan used in industry with their respective acceptance criteria. 7

8. Write short notes on ***any four*** of the following : **3½x4=14**

(a) Taylor's principle of gauge design

(b) Mechanical comparator

(c) Floating carriage micrometer

(d) Coordinate measuring machine

(e) Six Sigma

(f) Quality standards