Date: 04/03/15   Branch: ME & AUTO
Sub: Mechanical Measurements and Metrology   Max Marks: 30
Time: 12:00-01:30pm

Instructions:
1. Use of scientific calculator is permitted.
2. Assume suitable data if necessary clearly stating the same.
3. Figures to the right indicate full marks.
4. Notations and symbols carry usual meaning.

Q.1	A	Define: (i) Fit (ii) Basic size (iii) Fundamental deviation (iv) Accuracy (v) Precision	05
	B	With the aid of neat sketch explain the principle of operation of Sigma comparator.	05
Q.2	A	Determine the tolerances on the hole and shaft for a precision running fit designated by 50H7/g6. Draw the diagram of the fit. You may use the following information 50 mm lies between 30-50 mm range $i = 0.46(D)^{1/3} + 0.001(D)$, microns FD for H= 0 FD for g= $-2.5 D^{0.34}$ IT7= 16i & IT6= 10i	05
	B	State Taylor's principle for design of limit gauges. State the limitations of the same.	03
	C	Differentiate between Line standard and End standard.	02

<div align="center">OR</div>

Q.2	A	Explain tooth thickness measurement by gear tooth vernier caliper.	05
	B	Sate the function of a C-type spanner usually provided in micrometer box? Why is it important to use the ratchet when taking measurements with a micrometer? Draw the sketch indicating reading of 23.78 mm on micrometer.	03
	C	Describe an International Prototype Metre.	02
Q.3	A	Examine the mechanism of a bourdon tube pressure gauge with sketch and explain how the tube functions. Mention the materials used for the tube. State various errors found in bourdon tube.	05
	B	Discuss the principle and working of thermal conductivity gauges with sketch.	05

<div align="center">OR</div>

Q.3	A	Explain the law of intermediate temperatures and the law of intermediate metals used in thermocouples (with sketch).Discuss the influence of these laws on industrial usage of thermocouples.	05
	B	Sketch a typical radiation pyrometer and explain its working with noteable characteristics.	05

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