

Code No: RT31036

**R13****SET - 1****III B. Tech I Semester Supplementary Examinations, October/November - 2018****METROLOGY**

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)  
2. Answering the question in **Part-A** is compulsory  
3. Answer any **THREE** Questions from **Part-B**

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**PART -A**

- 1 a) State the condition when the shaft based system is used for limits and fits. [3M]
- b) Write short notes on 'Standards'. [4M]
- c) What are the applications of tool makers microscope? [4M]
- d) List the advantages of electronic comparators. [3M]
- e) What are the applications of flange micro meter? [4M]
- f) Name the various instruments required for performing the alignment tests on machine tool. [4M]

**PART -B**

- 2 a) Define fit and describe various types of fits in brief? [8M]
- b) Determine and sketch the limits of tolerance and allowance for a 42 mm shaft and hole pair designated as H 8 - g10. The basic size lies in the range of 30 – 50 mm. The multipliers for grades 8 and 10 are 25 and 64 respectively. The fundamental deviation for g shaft is ( $- 2.5 D^{0.34}$ ) microns. The standard tolerance unit is  $i = 0.45 (D)^{1/3} + 0.001D$  in microns. [8M]
- 3 a) Explain the construction and working of a Vernier Caliper. [8M]
- b) State and explain the Taylor's principle of gauge design with neat sketch of Plug gauge and Snap gauges. [8M]
- 4 a) With a neat sketch explain the working principle of Auto Collimator. [8M]
- b) Explicate the uses of interferometer in measuring flatness of surfaces. [8M]
- 5 a) Explain the construction and working of Sigma mechanical comparator with a neat sketch. [10M]
- b) State and explain the methods of measuring primary texture of a surface. [6M]
- 6 a) What are the various errors in screw threads? Discuss sources of these errors and precautions need to minimize or completely eliminate these errors. [8M]
- b) Explain with a schematic sketch' the method of checking the in volute gear tooth profile. [8M]
- 7 a) State various applications of straight edges. [6M]
- b) What are the various alignment tests performed on vertical milling machine and discuss any two of them in detail. [10M]

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