Code No: **R32031** **R10** **Set No. 1**

III B.Tech II Semester Supplementary Examinations, April - 2018

METROLOGY

(Mechanical Engineering)

Time: 3 hours **Max. Marks: 75**

Answer any FIVE Questions

All Questions carry equal marks

*****

1 a) Determine and sketch the limits of tolerance and allowance for a 90mm shaft and hole pair designated H_8–e_9. The basic size lies in the range of 80-100mm. The multipliers for grades 8 and 9 are 25 and 40 respectively. The fundamental Deviation for 'e' shaft is (-11 $D^{0.41}$) microns. [8M]

b) Differentiate between shaft basis system and hole basis systems [7M]

2 a) Differentiate between Line Standard and End Standard of measurement. Bring out suitable examples under each category. [8M]

b) Explain the construction of vernier level protractor with neat sketch. [7M]

3 a) Explain with neat sketch, the principle and construction of an Autocollimator. [8M]

b) Explain the basics of light interference and fringe formation. [7M]

4 a) The measurement of surface roughness the height of 10 successive peaks and valleys over datum line over a specified sampling length were found to be [8M]

Peaks 45 42 40 35 35µm
Valley 30 25 25 24 18µm

Determine the 'Rz' value of the surface

b) Define the following in connection with surface texture assessment. [7M]
i)Roughness ii)Waviness
iii)Lay iv)Sampling length

5 a) What is a comparator? State the types of Comparators and briefly give a note on them. [8M]

b) Explain the Optical Comparator in detail with advantages, limitations and applications. [7M]

Code No: **R32031** **R10** **Set No. 1**

6 a) What are the different elements of a spur gear which require inspection? Name the instruments used in the inspection of these elements with their expected accuracies? [8M]

b) Describe the Parkinson's gear tester and state its limitations [7M]

7 a) Explain the measurement of effective diameter using [8M]
i) Thread micrometer ii) one wire method.

b) Define "best wire size"? Compute the "best wire size" for 20 mm ISO thread of 3 mm pitch. [7M]

8 a) Explain the following alignment tests on lathe: [8M]
i) True running of locating cylinder of main spindle.
ii) True running of head stock centre.

b) Discuss briefly the alignment tests performed on drilling machine. [7M]

*****