Code No: **R32241** **R10** **Set No. 1**

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

MACHINE TOOLS & METROLOGY

(Automobile Engineering)

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

Answer any FIVE Questions

All Questions carry equal marks

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1 a) Explain what is meant by a Taper. Discuss in detail the taper turning by compound rest swelling method? [8M]

b) How is the chip formed in metal cutting? Explain the terms Shear plane and Shear Zone. [7M]

2 a) What is the principle of working of milling machines? How do you classify the milling machine? [8M]

b) With neat sketch explain any one type collet chuck. [7M]

3 a) Describe the operation of quick return motion in mechanical Shaper [7M]

b) Explain various operations performed in drilling machine. [8M]

4 a) What is meant by centerless grinding? State its advantages and limitation of it [8M]

b) Explain the difference between lapping , honing and grinding. [7M]

5 a) Explain clearly what is meant by "selective assembly". Give one practical example [7M]

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]

6 a) Design the general type GO & NO-GO gauge for components having 20H7f8 fit. given: [8M]
i) I(micron) = 0.45$(D)^{1/3}$ + 0.001D
ii) Upper deviation of ' f 'shaft = -5.5 $D^{0.41}$
iii) 20 mm falls in the diameter step of 18 mm to 30 mm.
iv) IT7 = 16 i
v) IT8 = 25 i
vi) Wear allowance 10% of gauge tolerance.

b) Explain with neat sketches the variants of sine bars and their applications. [7M]

7 a) Elaborate in detail the specifications and measurement of surface roughness by Talysurf Technique. [7M]

b) Explain with the neat diagram the method for measurement of straightness of a machine tool guide way using an auto collimator. [8M]

8 a) With neat diagram explain how gear tooth thickness is measured using a gear tooth vernier caliper [8M]

b) Discuss elements of screw thread with neat sketch. [7M]

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