

Code No: 135BE**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech III Year I Semester Examinations, May/June - 2019****METROLOGY AND MACHINE TOOLS****(Mechanical Engineering)****Time: 3 hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

1. a) How do you specify a Engine Lathe? [2]
- b) Distinguish between orthogonal cutting and oblique cutting? [3]
- c) What is boring? Sketch a boring tool? [2]
- d) What is the function of flutes on a twist drill? [3]
- e) Compare up milling and down milling? [2]
- f) Write the principle of differential indexing? [3]
- g) Define Tolerance? Classify different types of tolerances? [2]
- h) Define fit? Classify different types of fits? [3]
- i) What do you mean by RMS and CLA? [2]
- j) Write the applications of coordinate measuring machines? [3]

PART - B**(50 Marks)**

- 2.a) Derive an expression to determine chip thickness ratio and shear angle?
 - b) Compare ASA system and ORS system in designating a single point cutting tool? [10]
- OR**
- 3.a) Explain in detail the different methods of Taper Turning?
 - b) With the help of a neat sketch explain the construction and working of Engine lathe? [10]
- 4.a) Explain in detail the construction and working of Boring machine?
 - b) Explain the mechanism of material removal in planning machine? [10]
- OR**
- 5.a) With the help of a neat sketch explain the construction of vertical shaping machine?
 - b) Compare and contrast shaper and slotter machines? [10]
- 6.a) With the help of neat sketch explain the different elements in a plain milling cutter?
 - b) Explain in detail the construction and working of cylindrical grinding machine with a neat sketch? [10]
- OR**
- 7.a) Enumerate different types of abrasives used and How do you specify a grinding wheel?
 - b) Compare and contrast compound indexing and differential indexing? [10]

8.a) In an assembly of two parts of 50 mm nominal diameter the lower deviation of the hole is zero and upper deviation is 5 microns. While the shaft is -8 and -4 microns respectively estimate the allowance and type of fit?

b) What are the advantages and limitations of GO and NO GO gauges? [10]

OR

9.a) Explain in detail the working of sine bar and what are its limitations?

b) State and explain the Taylor's principle of gauge design with neat sketch of Plug gauge and Snap gauges? [10]

10.a) State the various factors affecting surface texture in detail?

b) State and explain the methods of measuring primary texture of a surface? [10]

OR

11.a) Distinguish between surface roughness and surface waviness?

b) Explain in detail the alignment test performed on milling machine? [10]

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