

R18

Code No: 155CE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year I Semester Examinations, March - 2024

METROLOGY AND MACHINE TOOLS

(Mechanical Engineering)

Time: 3 Hours

Max. Marks: 75

Note: i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART - A

(25 Marks)

- 1.a) Name different methods of taper turning. [2]
- b) Explain the numerically controlled turret lathes. [3]
- c) How slotting machine is specified? [2]
- d) How do you adjust the length of the stroke in shaper? [3]
- e) What is lapping? How is it done? [2]
- f) Why 'trueing' and 'dressing' are necessary in grinding wheels? [3]
- g) What are the limitations of interchangeable assembly? [2]
- h) With an example, explain GO and NOGO gauges. [3]
- i) Give the classification of CMMs. [2]
- j) What are the inspection methods used for measurement of surface finish? [3]

PART - B

(50 Marks)

- 2.a) Name the factors that contribute to the formation of segmental chips.
- b) How the sizes of Turret and Capstan lathes specified? [5+5]

OR

- 3.a) What do you understand by parallel action and progressive action in multi-spindle lathes?
- b) Explain the various parts of Lathe. [5+5]

- 4.a) Draw a neat sketch of slotter and name its main parts.
- b) Differentiate between shaping and planing machines. [5+5]

OR

- 5.a) Draw a neat sketch of a standard twist drill and indicate the nomenclature of various parts and angles.
- b) How do you carry deep hole drilling? Discuss in detail. [5+5]

- 6.a) Explain the following milling operations: i) Straddle milling ii) Gang milling.
- b) Sketch and describe a Universal milling machine. [5+5]

OR

- 7.a) Write any five advantages of center less grinding.
- b) What is compound indexing? How it is done? [5+5]

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8.a) With the help of neat sketches, state the essential conditions for clearance fit and interference fit.

b) Explain the construction and working of a Bevel protractor. [5+5]

9.a) Explain the terms Hole based system and Shaft based system? When shaft basis system is preferred compared to Hole basis system?

b) Explain the method of checking the height of component with the help of optical flat. [5+5]

10.a) Distinguish between surface roughness and surface waviness.

b) Describe various alignment tests to be conducted on lathe machines. [5+5]

11.a) Write short note on gear measuring instruments.

b) Discuss the major applications of CMMs. [5+5]

OR

OR

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QA QA QA QA QA QA QA G

QA QA QA QA QA QA QA G

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