



# CBCS SCHEME

16

15MA744

Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020

## Precision Engineering

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

### Module-1

- 1 a. Briefly, explain different elements involved in the part accuracy. (10 Marks)  
b. Illustrate the following with regard to concept of accuracy :  
i) Axial run out ii) Non parallelism of axes iii) Surfaces not square with each other. (06 Marks)

OR

- 2 a. What is displacement accuracy of a machine tool? Discuss its basic components. (10 Marks)  
b. Discuss the errors due to numerical interpolation. (06 Marks)

### Module-2

- 3 a. Discuss the scheme for the calculation of overall compliance of a lathe. (08 Marks)  
b. Illustrate the deflection at various points along the length of the work piece turned between centers. (08 Marks)

OR

- 4 a. Illustrate the axis displacement of lathe spindle nose relative to the spindle speed. (08 Marks)  
b. Discuss the effect of cutting speed on the surface roughness of a turned mild steel species. (08 Marks)

### Module-3

- 5 a. Define the following terms:  
i) Superfluous dimensioning  
ii) Functional or key dimension  
iii) Dimensional chain. (06 Marks)  
b. Discuss the two methods of dimensioning a stepped shaft. (10 Marks)

OR

- 6 Explain with an example, how tolerances are assigned on the constituent dimensions. (16 Marks)

### Module-4

- 7 a. Illustrate the basic steps involved in a lithographic process, used to fabricate a device. (10 Marks)  
b. With a neat schematic diagram, explain the basic setup for the spin casting of a photoresist layer onto silicon wafer. (06 Marks)

OR

- 8 a. Discuss the 3 principal steps involved in wet chemical etching process. (06 Marks)  
b. Illustrate the characteristic profiles of isotropic and vertical etching process. (05 Marks)  
c. With a Schematic diagram, explain the construction and working of a simple prototype thermal CVD reactor. (05 Marks)

### Module-5

- 9 a. Discuss the basic architecture of a smart micro system. (06 Marks)  
b. Discuss the construction and working of a microvalve. (10 Marks)

OR

- 10 a. Discuss the construction and working of an electrostatic micromotor. (10 Marks)  
b. Explain the micronozzle fabrication process. (06 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.