

CBCS SCHEME

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18IP44

Fourth Semester B.E. Degree Examination, Jan./Feb. 2023 Manufacturing Process – II

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Differentiate between orthogonal and oblique cutting. (06 Marks)
- b. With assumptions derive the expression $\phi = \frac{\pi}{4} - \frac{\beta}{2} + \frac{\alpha}{2}$, using Ernst – Merchant theory. (07 Marks)
- c. In an orthogonal cutting the following observations were made.
Chip thickness = 0.62 mm, Feed = 0.2 mm, Rake angle = 15°. Calculate chip reduction coefficient and shear angle. (07 Marks)

OR

- 2 a. List and explain different types of tool wear. (05 Marks)
- b. Discuss about Tool failure criterion. (05 Marks)
- c. The Taylorian tool life equation for machining with a 18 : 4 : 1 HSS cutting tool at a feed of 0.32 mm/min and a depth of cut of 2.9mm is given by $VT^n = C$, where n and C are constants the following V and T observations have been noted:

V, m/min	29	39
T, min	89	26

Calculate (i) n and C (ii) recommend the cutting speed for a desired tool life of 78 min.

(10 Marks)

Module-2

- 3 a. List out the materials used for cutting tool. Discuss briefly about any one of them with composition. (06 Marks)
- b. What are the properties of cutting fluid? (06 Marks)
- c. List out the different methods for determination of tool temperatures and explain any one of it in detail, with a neat sketch. (08 Marks)

OR

- 4 a. What are differences between capstan and turret lathes? (06 Marks)
- b. Classify the different shapers. Explain the constructional features of shaper with parts. (06 Marks)
- c. A shaper makes 36 complete stroke/min and stroke length is 30 cm. The shaper has a cutting stroke to return stroke ratio is 3:2. Determine the cutting speed in m/min. (08 Marks)

Module-3

- 5 a. Explain briefly with suitable sketches any two operations to be performed on a drilling machine. (06 Marks)
- b. With neat sketch describe constructional features and working principle of radial drilling machine. (06 Marks)
- c. Find the time required to drill 6 holes of 16mm diameter each on a flange. Assume flange thickness = 30mm, cutting speed = 20 m/min, feed = 0.2 mm/rev. (08 Marks)

OR

- 6 a. Explain following milling operation with relevant sketches:
 (i) Gang milling (ii) Straddle milling (06 Marks)
 b. With neat sketch describe working principle of column and knee type of milling machine with main parts. (08 Marks)
 c. Show the calculation for indexing 30 equal divisions in a milling machine. The following index plates are available.
 Plate No. 1 : 15, 16, 17, 18, 19, 20
 Plate No. 2 : 21, 23, 27, 29, 31, 33
 Plate No. 3 : 37, 39, 41, 43, 47, 49
 Find the simple indexing arrangement. (06 Marks)

Module-4

- 7 a. What do you mean by grit, grade and structure of grinding wheel? (08 Marks)
 b. With help of a block diagram explain the working of a centre-less type grinding machine. (06 Marks)
 c. List and explain any three types of abrasives used in grinding machine. (06 Marks)

OR

- 8 a. Differentiate clearly between push broach and pull broach. (06 Marks)
 b. With a neat sketch, explain Progressive Cut Broaches. (08 Marks)
 c. List the advantages, disadvantages and applications of broaching. (06 Marks)

Module-5

- 9 a. Explain the following finishing processes:
 (i) lapping (ii) honing (iii) polishing (iv) buffering (16 Marks)
 b. Classify the NTM process. (04 Marks)

OR

- 10 a. Explain with neat sketch, principle and applications of ultrasonic machining process. (08 Marks)
 b. Explain briefly with a neat sketch the working principle of PAM. (06 Marks)
 c. Explain briefly with a neat sketch the working principle of Water Jet Machining. (06 Marks)

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