Reg. No. : | | | | | | | | | | |

Question Paper Code: 41473

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Fourth Semester

Mechanical Engineering

14UME403 - MANUFACTURING TECHNOLOGY - II

(Regulation 2014)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. In any metal cutting, cutting force at job-tool contact point is measured by

   (a) Wattmeter (b) Dynamometer
   (c) Pyrometer (d) Hydrometer

2. Tool life of 10 hours is obtained when cutting with single point tool at 63 *m/min*. If Taylor's constant C = 257.35, tool life on doubling the velocity will be

   (a) 5 hours (b) 25.7 min (c) 38.3 min (d) unchanged

3. Tool life is very much affected by

   (a) Depth of cut (b) Tool geometry
   (c) Cutting speed (d) Feed

4. The type of turret indexing mechanism is

   (a) Ratchet and pawl (b) Geneva
   (c) Cam mechanism (d) Rack and Pinion

5. The process of removing metal by a milling cutter, which is rotated in the same direction as the feed of the work piece

   (a) Face milling (b) Conventional milling
   (c) Up milling (d) Climb milling

6. Trepanning is performed for

(a) Finishing a drilled hole (b) Producing a large hole without drilling
(c) Truing a hole for alignment (d) Enlarging a drilled hole

7. Honing is an operation primarily used for finishing

(a) Flat surface (b) Cylindrical surface
(c) Hole (d) Irregular surface

8. Internal gear cutting operation can be performed by

(a) Milling (b) shaping with rack cutter
(c) shaping with pinion cutter (d) hobbing

9. Several machine tools can be controlled by a central computer in

(a) Numerical Control machine tool
(b) Computer Numerical Control machine tool
(c) Direct Numerical Control machine tool
(d) Central- Computer Numerical Control machine tool

10. In an NC machining operation the G code for the tool movement along a circular path is

(a) G03 (b) G02 (c) G01 (d) G00

PART - B (5 x 2 = 10 Marks)

11. What is the influence of cutting speed and feed on tool life?

12. What is the difference between feed rod and lead screw?

13. What are the advantages of Up-milling process?

14. Why are speeds so much higher in grinding than in cutting?

15. Mention the various forms to input a part program to a CNC machine.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the mechanics of chip formation and also the types of chips produced in metal cutting. (16)

Or

(b) The orthogonal cutting of steel with 10^0 rake tool, with a depth of cut of 2 *mm*, and feed rate of 0.20 *mm/rev*. The cutting speed is 200 *m/min*. The chip thickness ratio is 0.31.

The vertical cutting force is 1200 *N* and the horizontal cutting force is 650 *N*. Calculate from Merchant's theory, the work done in metal cutting and shear stress. (16)

17. (a) Explain with neat sketch the methods used for taper turning operation in an engine lathe. (16)

Or

(b) Describe the types of machining operations that can be performed on a lathe with suitable sketches. (16)

18. (a) Explain the universal dividing head and simple indexing methods with illustrative example for milling spur gear. (16)

Or

(b) (i) Differentiate between planning and shaping operations and their applications. (8)

(ii) Explain about the broaching operation. (8)

19. (a) Explain with neat sketch the gear manufacturing methods. (16)

Or

(b) (i) Explain the common bonding methods used for bonded abrasives. (8)

(ii) What are the consequences of allowing the temperature to rise during grinding? (8)

20. (a) Explain the principles of CNC machines. (16)

Or

(b) Explain the various components of numerical control machine tools. (16)

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