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Question Paper Code: 50743

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

Fourth Semester

Mechanical Engineering

15UME403 - MANUFACTURING TECHNOLOGY – II

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

- In orthogonal cutting the cutting edge is
 - Perpendicular to the direction of tool travel
 - Perpendicular to the shear plane
 - Perpendicular to the direction of cut
 - In line with the direction of cut
- In metal cutting, use of low feeds and high cutting speeds is desired when the objective is
 - High metal removal rate
 - Dry machining tool
 - Use of soft cutting tool
 - Surface finish
- For taper turning on centre lathes, the method of swiveling the compound rest is preferred for
 - Long jobs with small taper angle
 - Long jobs with steep taper angle
 - Short jobs with small taper angle
 - Short jobs with steep taper angle

4. For the manufacture of screw fasteners on a mass scale, which is the most suitable machine tool?
- (a) Capstan lathe (b) Single spindle automat
(c) CNC turning centre (lathe) (d) CNC machining centre
5. Low helix angle drills are preferred for drilling holes in
- (a) Plastics (b) Copper (c) Cast steel (d) Carbon steel
6. Which one of the following is true for the last few teeth of a broach which are meant for fine finishing?
- (a) They have equal diameter
(b) They have increasing diameter
(c) They have decreasing diameter
(d) They have alternatively increasing and decreasing diameter
7. Honing process employs
- (a) Trepanning tool (b) Side milling cutter
(c) Hob cutter (d) Abrasive sticks
8. Which of the following processes of gear manufacturing results in best accuracy of involutes gear tooth profile?
- (a) Milling (b) Hobbing
(c) Rotary gear shaper (d) Rack type gear shaper
9. The power requirement for the ball screw arrangement is less due to
- (a) Reduced capacity (b) Reduced friction
(c) Reduced material usage (d) Reduced power rating
10. All the axes in a CNC machine are controlled by
- (a) Stepper motor (b) Servo motor
(c) Pneumatic motor (d) Hydraulic motor

PART - B (5 x 2 = 10 Marks)

11. Name the four types of chips that occur in metal cutting.
12. List the advantages of turret lathe over capstan lathe.
13. List the differences between up milling and down milling.

14. What is objective of gear shaving process?
15. Compare and list the important differences between NC and CNC machines.

PART - C (5 x 16 = 80 Marks)

16. (a) The cutting force and thrust force in an orthogonal cutting operation are 1470 N and 1589 N, respectively. Rake angle = 5° , width of the cut is 5 mm and chip thickness before cut is 0.6 mm and chip thickness ratio is 0.38. Determine: (i) The shear strength of the work material and (ii) The coefficient of friction in the operation. (16)

Or

- (b) Identify three desirable properties of a cutting-tool material also list the properties and applications of following cutting tool materials High Speed Steel (HSS), Carbides and Ceramics. (16)
17. (a) Explain any two methods of taper turning operation in lathe with neat sketch. (16)

Or

- (b) Explain the bar feeding mechanism and turret indexing mechanism of a semi-automatic lathe with neat sketch. (16)
18. (a) Explain the parts and working principle of a planner with a neat sketch also explain the features and list their advantages over a shaper. (16)

Or

- (b) Explain the principle of broaching operation with neat sketch also explain the nomenclature of broaching tool. (16)
19. (a) Describe the gear hobbing and gear shaping process with a neat sketch. (16)

Or

- (b) Discuss the working principle and applications of honing, lapping and super finishing processes. (16)
20. (a) Explain the constructional features and working principle of a CNC machine. (16)

Or

- (b) Describe with neat sketch various steps involved in the manual part programming. (16)

