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Question Paper Code : 41392

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018

Fourth/Sixth Semester

Mechanical Engineering

ME 6402 – MANUFACTURING TECHNOLOGY – II

(Common to Mechanical Engineering(Sandwich)/Industrial Engineering/Industrial Engineering and Management/Mechanical and Automation Engineering)

(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. List the physical functions of a machine tool in machining.
2. Define the oblique cutting.
3. What are the various mechanisms that are used for automatic feeding in lathes ?
4. Write the advantages of automats over conventional lathes.
5. Name any four work holding devices in shaper.
6. List the applications of gear hobbing.
7. What are the specifications of grinding wheel ?
8. Why is the centre less grinders called specialized machine for Cylindrical parts ?
9. Write the disadvantages of manual part programming.
10. What are the challenges in wafer machining ?



PART – B

(5×13=65 Marks)

11. a) i) The following data from an orthogonal cutting test is available (9)

- a) Rake Angle = 15°
- b) Chip Thickness Ratio = 0.383
- c) Uncut Chip Thickness = 0.5 mm
- d) Width of Cut, B = 3 mm
- e) Yield Stress of Material In Shear = 280 N/mm^2
- f) Average coefficient of friction on the tool face = 0.7

Determine the normal and tangential forces on the tool face.

ii) Draw the schematic diagram illustrating the characteristics of Built-up-Edge(BUE) formation in the machining process. (4)

(OR)

b) Describe the following :

- i) Mechanisms and pattern (geometry) of cutting tool wear. (8)
- ii) Essential properties of cutting fluids. (5)

12. a) With the help of suitable sketches describe the following :

- i) Taper turning by using taper turning attachment. (9)
- ii) Taper turning by combining longitudinal feed and cross feed. (4)

(OR)

b) Enumerate the constructional details and working principle of turret indexing mechanism in Capstan and turret lathes. (9+4)

13. a) Discuss in detail about the features of hydraulic drive of a horizontal shaper and list its advantages also. (9+4)

(OR)

b) Write short notes on gear shaping. List the advantages and disadvantages of gear shaping process.

14. a) Explain the working mechanism of the following grinding process briefly

- i) Cylindrical surface grinding. (7)
- ii) Centerless grinding. (6)

(OR)



- b) Explain the working mechanism of the following broaching process briefly
- i) Surface broaching. (7)
 - ii) Continuous broaching. (6)
15. a) Describe the drive systems used in CNC machine tools. (13)
- (OR)
- b) Describe the following :
- i) With a neat sketch, explain the working of ATC. (8)
 - ii) Write short notes on APT language. (5)

PART – C

(1×15=15 Marks)

16. a) i) Explain the part program segment given below. Draw the trajectory of table motion that this program seeks to create. (4+4)
- N0010G90;
N0011G01X1Y2;
N0012G01X2Y2
N0013G91;
N0014G01X1;
N0015G92X2Y2;
N0016G01X1Y1
- ii) Is there any connection between the choice of coordinate system and the position sensor used in the machine tool ? (4)
 - iii) Comment on the sensing requirements for PTP and Contouring axes. (3)
- (OR)
- b) Write a note on heat generation in metal cutting. What is the importance of analysing the thermal aspects of machining ? (15)
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- 15. a) Describe the drive systems used in CNC machine tools. (10)
- i) Servo Drives
- ii) Continuous Drives
- b) Explain the working mechanism of the following processes briefly: (10)
- i) Surface Grinding
- ii) Continuous Grinding

PART - C

- 16. a) i) Explain the part program segment given below. Draw the trajectory of this motion that this program seals to create. (4)
- N0010 G00 X100 Y100
- N0020 G01 X150 Y150 F100
- N0030 G02 X200 Y200 I50 J50
- N0040 G01 X250 Y250
- N0050 G00 X100 Y100
- N0060 M02
- ii) Comment on the naming requirements for TTP and Contouring axes. (3)
- iii) Is there any connection between the limits of coordinate system and the position sensor used in the machine tool? (3)
- b) Write a note on heat generation in metal cutting. What is the importance of analyzing the thermal aspects of machining? (10)