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Question Paper Code : 57550

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Fourth Semester

Mechanical Engineering

ME 6402 – MANUFACTURING TECHNOLOGY – II

(Common to Industrial Engineering, Industrial Engineering and Management and Mechanical and Automation Engineering and also common to sixth semester Mechanical Engineering (SANDWICH))

(Regulation 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. Differentiate between orthogonal and oblique cutting.
2. The useful tool life of an HSS tool, machining mild steel at 25 m/min is 5 hours. Calculate the tool life when tool operates at 40 m/min.
3. How do you specify a lathe ?
4. What are the differences between automatic lathe and capstan lathe ?
5. Distinguish between up milling and down milling.
6. Why gear finishing is required ?
7. How do you specify a grinding wheel ?
8. What are the three methods of external cylindrical centreless grinding ?
9. State the functions of the following G & M codes :
G00 G03 M06 M03
10. Define "micromachining" with the help of an example.

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PART - B (5 × 16 = 80 Marks)

11. (a) (i) Discuss any four cutting tool materials used in metal cutting. (8)
- (ii) In an orthogonal cutting test with a tool of rake angle 8° , the following observations were made :
- Chip thickness ratio : 0.2
- Horizontal component of the cutting force = 1190 N
- Vertical component of the cutting force = 1450 N
- From Merchant's theory, calculate the various components of the cutting forces and the coefficient of friction at the chip tool interface. (8)

OR

- (b) (i) Enumerate with neat sketch, measurement of cutting temperature using work-tool thermocouple method. (8)
- (ii) Describe various methods of applying cutting fluid at the cutting zone. (8)

12. (a) (i) Discuss any two operations that can be performed on a lathe ? (8)
- (ii) What are the various methods available for supporting long components and fragile components in a lathe ? Explain with sketches. (8)

OR

- (b) (i) Enumerate with neat diagram the principal parts of capstan and turret lathe. (8)
- (ii) Describe various types of multi spindle automats. (8)

13. (a) (i) List out various operations carried out on drilling machine. Explain any three. (8)
- (ii) What are the various types of milling cutters that are used in milling ? Discuss any three. (8)

OR

- (b) (i) What are the various methods used for gear finishing ? Discuss any two methods. (8)
- (ii) Enumerate with neat sketch kinematics of gear shaping machine. (8)

14. (a) (i) List out various abrasives used in grinding wheel. Explain any three. (8)
(ii) Explain with neat sketches the three methods of external cylindrical centreless grinding. (8)

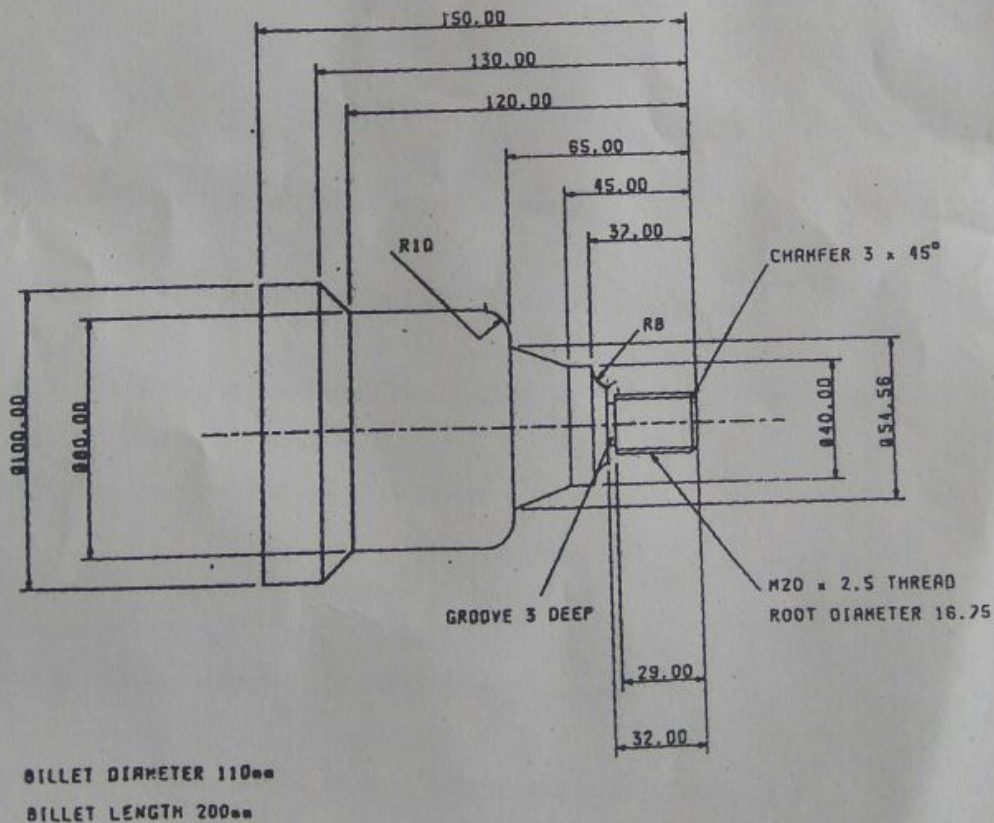
OR

- (b) (i) Explain with neat sketches Horizontal pull broaching operation and Vertical push broaching operation. (8)
(ii) List out various types of bonding materials used in grinding wheel. Explain any three. (8)

15. (a) (i) Enumerate the constructional features of CNC machining centre. (8)
(ii) Describe various type of CNC machine based on tool motion. (8)

OR

- (b) Write CNC part program for the component shown in Fig. Mention the assumptions made. (16)



All dimensions in mm.

Fig. Q 15(b)