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Question Paper Code : 50861

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017

Fourth/Sixth Semester

Mechanical Engineering

ME 6402 – MANUFACTURING TECHNOLOGY – II

(Regulations 2013)

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

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. How does rake angle affect the life of the cutting tool ?
2. Classify the types of cutting fluids.
3. What are the principle parts of lathe ?
4. List out the various types of lathe.
5. Why reaming operation is performed ?
6. Differentiate up milling and down milling.
7. Define grinding ratio.
8. Why broaching process is long and laborious ?
9. What are G-codes and M-codes ?
10. State the limitations of CNC machine tools.



PART - B

(5×13=65 Marks)

11. a) The following data was obtained from an orthogonal cutting test. Rake angle = 20° , Depth of cut = 6 mm, feed rate = 0.25 mm/rev. cutting speed = 0.6m/s, chip length before cutting = 29.4 mm, vertical cutting force = 1050 N, horizontal cutting force = 630 N, chip length after cutting = 12.9 mm, Using merchant's analysis, calculate (i) Magnitude of resultant force, (ii) Shear plane angle, (iii) friction force and friction angle and (iv) various energies consumed. (13)

(OR)

- b) i) Enumerate essential requirements of the cutting tool material. (6)
 ii) With the neat sketch, describe the various types of chips produced during metal machining. (7)

12. a) Describe the types of machining operations that can be performed on a lathe, with neat sketch. (13)

(OR)

- b) Describe the method of operation of the Swiss-type automatic lathe, with application and tools used. (13)

13. a) i) Explain, why the sequence of drilling, boring and reaming produces a hole that is more accurate than sequence of drilling and reaming. (5)

- ii) With the neat sketch, explain the various operation performed in the milling machine. (8)

(OR)

- b) i) State the principle of gear hobbing and explain how a spur gear is machined in a gear hobbing machine with neat sketches. (8)

- ii) List the advantages, disadvantages and limitation of gear shaping process. (5)

14. a) i) Discuss various bonding material used for making grinding wheel. (6)

- ii) Explain the working principle of the centreless grinding process. (7)

(OR)

- b) i) Discuss the concept of surface integrity. (6)

- ii) Explain continuous surface broaching machine with neat sketch. (7)



15. a) Explain the constructional and special features of CNC machine. (13)

(OR)

- b) With a suitable example, explain the part programming procedure. (13)

PART - C

(1×15=15 Marks)

16. a) With a suitable example, explain the technical and economic factors involved in cutting tool material selection. (15)

(OR)

- b) List the finishing operations commonly used in manufacturing operations. Why are they necessary? Explain why they should be minimized. (15)