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

Question Paper Code : 77214

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2015.

Fourth Semester

Mechanical Engineering

ME 6402 — MANUFACTURING TECHNOLOGY – II

(Common to Industrial Engineering, Industrial Engineering and Management and Mechanical and Automation Engineering)

(Regulation 2013)

Time : Three hours | Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Write a short note on Heat zones in cutting.

2. Write a short note on any two modern tool materials.

3. What is meant by "swing of the lathe"?

4. What do you mean by copy turning?

5. What do you mean by differential indexing?

6. Why is milling a versatile machining process?

7. How does loading differ from glazing in grinding process?

8. What are the principal types of Broaching machines?

9. Define CNC and DNC.

10. What is adaptive control?

PART B — (5 × 16 = 80 marks)

11. (a) (i) With reference to orthogonal cutting, explain the following terms: Shear stress in shear plane, Shear strain, Cutting ratio, Shear angle. (8)

(ii) Prove that in orthogonal cutting, the kinetic coefficient of friction (μ) is given by $\mu = \frac{F_c \sin\alpha + F_t \cos\alpha}{F_c \cos\alpha - F_t \sin\alpha}$. (8)

Or

(b) (i) Tool life tests in turning yield the following data: (1) V = 110m/min, T = 20 min; (2) V = 85 m/min, T = 40 min. (A) Determine the n and C values in the Taylor tool life equation. Based on the equation, compute (B) the tool life for a speed of 95 m/min and (C) the speed corresponding to a tool life of 30 min. (8)

(ii) Explain different types of chips produced in cutting with neat sketches. (8)

12. (a) (i) Enumerate the purpose of various attachments used on a centre lathe. (8)

(ii) Explain with a neat sketch single spindle automatic lathe. (8)

Or

(b) (i) Describe a Universal type milling machine. (8)

(ii) Explain the salient features of an automatic screw machines. (8)

13. (a) (i) Explain with neat sketches the procedure for carrying out the following operations on a shaper: Horizontal cutting, Vertical cutting, concave surface, keyway cutting. (8)

(ii) List out the gear finishing processes. Explain any two with neat sketches. (8)

Or

(b) (i) Enumerate with a neat sketch Gear shaping. (8)

(ii) Compare Plain and Universal milling machine. (8)

14. (a) (i) Enumerate the advantages and disadvantages of centreless grinding. (8)

(ii) Explain the following in grinding (1) Dressing of (2) Truing. (8)

Or

(b) (i) The performance of a grinding wheel depends upon type of abrasive, grain size, grade, structure and bonding material. Discuss the effect of each. (8)

(ii) Discuss with neat sketch Vertical Broaching machine. (8)

15. (a) (i) Discuss the programming of NC machines. (8)

(ii) Discuss the constructional features of a NC machine tool and explain their functions. (8)

Or

(b) (i) List and explain the advantages of CNC systems over conventional NC systems. (8)

(ii) Explain the main difference between point to point and continuous path type numerically controlled machine tools. (8)

———————