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Question Paper Code : 27359

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Fourth Semester

Mechanical Engineering

ME 6402 — MANUFACTURING TECHNOLOGY – II

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

(Regulations 2013)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Mention the condition that induces the formation of Built up edge.
2. How tool life is estimated?
3. What are the differences between automatic lathe and capstan lathe?
4. Give a sketch illustrating the principle of operation of Swiss type automatic lathe.
5. Distinguish Up Milling and Down Milling.
6. Sketch the nomenclature of a drill bit.
7. List the factors involved in the selection of a grinding wheel.
8. What is the principle of a broaching process?
9. How are various functions timed in NC machines?
10. Distinguish a fixed zero and floating zero.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Discuss briefly the various types of tool wear with neat sketches. (12)
(ii) Mention the desirable properties of a cutting tool material and the improvements caused by coated carbides. (4)

Or

- (b) (i) In an orthogonal cutting test with a tool of rake angle 10° the following observations were made :

Chip thickness ratio = 0.3;

Horizontal component of the cutting force = 1290 N

Vertical component of the cutting force = 1650 N. From the Merchant's theory, calculate the various components of the cutting forces and the coefficient of friction at the chip tool interface. (8)

- (ii) What are the functions of a cutting fluid? Explain in detail, the guidelines adopted for the selection of cutting fluid based on material and tool characteristics. (8)

12. (a) (i) Enumerate the various methods of producing taper. (12)
(ii) Explain the purpose of centres used in lathe. (4)

Or

- (b) Briefly explain with a neat sketch, the types of work holding devices that are commonly employed in automatic lathe. Also specify its limitations.

13. (a) (i) Explain with a neat sketch, the quick return motion mechanism of a shaper. (12)
(ii) How the stroke length and position of the ram is adjusted? (4)

Or

- (b) Explain the following with a neat sketch :

- (i) Gear Generation Process. (8)
(ii) Gear Finishing Process. (8)

14. (a) (i) Describe the terms dressing and trueing of Grinding Wheels. (8)
(ii) Explain, how a wheel is balanced and mounted? (8)

Or

- (b) Describe the construction and operation of a vertical broaching machine with a neat sketch. Also sketch a broach tool with nomenclature.

15. (a) (i) Explain the advantages and limitations of NC machines. (8)
(ii) Describe four main features of CNC machines, which distinguish them from conventional machine tools. (8)

Or

- (b) Explain the various types of statements used in APT language, with suitable examples.