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Question Paper Code : 51850

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

Fourth Semester

Mechanical Engineering

**ME 2252/ ME 43/ME 1252 A/080120016/10122 ME 403 – MANUFACTURING
TECHNOLOGY – II**

**(Common to Industrial Engineering, Industrial Engineering and Management,
Mechanical and Automation Engineering and Mechanical Engineering (Sandwich) for
Sixth Semester)**

(Regulations 2008/2010)

**(Also Common to PTME 2250/10122 ME 403 Manufacturing Technology II for B.E.
(Part-Time) Third Semester Mechanical Engineering – Regulations 2009/2010)**

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. Differentiate between Orthogonal cutting and Oblique cutting.
2. List out the important properties of cutting tool materials.
3. With simple sketches show the single point tool nomenclature.
4. What are the advantages of automats ?
5. Differentiate between up milling and down milling.
6. What is the need of broaching operation ?
7. List the various grinding processes.
8. What is lapping ?
9. List the advantages of a CNC machine.
10. Write the general format of a block in CNC part programming.

PART – B (5 × 16 = 80 marks)

11. (a) (i) Describe any four important cutting tool materials. **(8)**

(ii) The following equation for tool life was obtained for H.S.S tool **(8)**

$$V T^{0.13} f^{0.6} d^{0.3} = C$$

A 60 min tool life was obtained using the following condition.

$$V = 40 \text{ m/min, } f = 0.25 \text{ mm, } d = 2 \text{ mm}$$

Calculate the effect on tool life if speed, feed, and depth of cut are together increased by 25% and also if they are increased individually by 25%.

Where f = feed, d = depth of cut and V = speed.

OR

(b) In an orthogonal cutting operation, the following data have been observed :

Uncut chip thickness = 0.127 mm

Width of cut = 6.35 mm

Cutting speed = 2 m/s

Rake angle = 20°

Cutting force = 567 N

Thrust force = 227 N

Chip thickness = 0.228 mm

Determine the shear angle, friction angle, shear stress along the shear plane and the power for the cutting operation. **(16)**

12. (a) (i) What are the different methods of taper turning ? And explain with a neat sketch, the method of taper turning by swiveling the compound rest method. (2 + 8)
- (ii) Differentiate between Capstan and Turret lathe. (6)

OR

- (b) With a neat sketch, explain the salient features of Swiss type automatic lathe. (16)

13. (a) Explain with a neat sketch, the Crank and slotted link mechanism of a shaper. And also explain the arrangement used for adjusting the position of stroke. (16)

OR

- (b) (i) Describe the various Sawing machines. (8)
- (ii) With a neat sketch, explain the various elements of broach tool. (8)

14. (a) How a grinding wheel is specified? And describe the various factors involved in selection of a grinding wheel. (16)

OR

- (b) (i) Describe with a neat sketch, the centreless grinder. (8)
- (ii) With a neat sketch explain any one gear shaping process. (8)

15. (a) What are the important components of NC system ? Describe them. (16)

OR

- (b) Explain with a neat sketch, the Slide ways and Ball screws used in CNC machine. (16)