Faculty of Engineering & Technology

Fourth Semester B.E. (Mechanical Engg.) C.B.S. Examination

MACHINING PROCESS

Time : Three Hours] [Maximum Marks : 80

INSTRUCTIONS TO CANDIDATES

(1) All questions carry marks as indicated.

(2) Solve Question No. **1 OR** Question No. **2.**

(3) Solve Question No. **3 OR** Question No. **4.**

(4) Solve Question No. **5 OR** Question No. **6.**

(5) Solve Question No. **7 OR** Question No. **8.**

(6) Solve Question No. **9 OR** Question No. **10.**

(7) Solve Question No. **11 OR** Question No. **12.**

(8) Due credit will be given to neatness and adequate dimensions.

(9) Assume suitable data wherever necessary.

(10) Diagrams and chemical equations should be given wherever necessary.

(11) Illustrate your answers wherever necessary with the help of neat sketches.

(12) Use of non-programmable calculator is permitted.

1. (a) During turning operation of mild steel work piece with a single point cutting tool, following observations were made : 4

$\alpha = 10°$, Shear stress = 600 MPa, b = 10 mm, v = 30 m/min, $\mu = 0.9$.

Determine chip thickness ratio, shear angle, shear force, friction angle, cutting force, power at cutting tools.

Assuming f = 0.25 mm/rev, t_c = 0.45 mm. 7

(b) Explain with neat sketch geometry of single point cutting tool and explain the importance of various angles of single point cutting tool. 7

OR

2. (a) Describe different types of chip formed in metal cutting. 6

(b) What is tool wear ? Explain its types. 5

(c) What are various types of coolants ? 3

3. (a) Explain the constructional features of simple Lathe with neat sketch. 5

(b) Describe the sliding gear mechanism used in all geared head stock of Lathe machine. 6

(c) Explain in short the function of Chuck in Lathe. 2

OR

4. (a) Differentiate between Capstan and Turret Lathe. Describe with neat sketch Capstan Lathe. Also give application of Capstan Lathe. 7

(b) How are Lathe classified ? Describe in brief the different types of Lathe. 6

5. (a) Explain principal parts of Shaper machine with neat sketch. 6

(b) Explain with neat sketch Whitworth Quick return mechanism. 7

OR

6. (a) Draw a neat sketch of Planer and explain the parts. 5

(b) State the main difference between Shaper and Planer. 4

(c) How the size of Planer specified ? Discuss. 4

7. (a) Draw a neat sketch of Column and Knee type horizontal spindle milling machine. Explain and label its main parts. 6

(b) Draw a neat sketch of plain milling cutter and state its angles. 7

OR

8. (a) What do you mean by indexing ? What are the various methods of indexing ? 7

(b) Explain up milling and down milling with neat sketch. 6

9. (a) Explain the working principle of centreless grinding and give various methods of feeding on it. 7

(b) What are surface grinders ? Explain with neat sketch the relative wheel and table movement on different surface grinders. 6

OR

10. (a) What are grit, grade and structure of abrasive particles used in grinding wheel ? Explain. 6

(b) What do you mean by super finishing process ? Explain any two types of super finishing operation. 7

11. (a) Draw a neat sketch of Radial drilling machine and explain its main parts. 7

(b) What are principal parts of drill ? Show the various parts of a drill with neat sketch. 7

OR

12. (a) What is boring ? Describe vertical boring machine with neat sketch. 7

(b) Explain Drilling, Reaming and Boring operation. How do they differ from each other ? 7