

B. Mechanical (Evening) 3rd year 1st. Semester Supple Examination , 2017

MACHINING TECHNOLOGY & METROLOGY

Attempt three questions from group A and two questions from group B

TIME : 3 hours

Full Marks : 100

GROUP - A

1. What is the full form of NC & CNC ? What types of drives are used in CNC machine tools? Why they are used? Draw a schematic block diagram of a numerical control system. Explain different coordinate systems used in NC/CNC system with necessary diagram. Illustrate the general practice in setting the part origin, program origin w.r.t machine origin in case of lathe with necessary diagram. 2+2+3+4+4+5 = 20

2. Define Machinability. What are the different time elements for calculation of Machining Time-Discuss in detail. Explain different types of chips formed under single point cutting tool with their conditions of formation in detail. Establish the relation between chip velocity , velocity of shear and cutting velocity. 2 + 6 + 6 + 6 = 20

3. What is chip breakers ? Explain different types of chip breakers used in machine shop. Explain cutting tool failure and tool wear in case of single point turning tool. Draw a neat sketch of a twist drill bit with proper labeling. 2 + 4 + 6 + 8 = 20

4. What is tool life ? discuss in detail. How tool life varies with cutting velocity? On what factors the speed & feed of a work piece depends? What are the main characteristics of a good tool material ? (2 + 4) + 4 + 6 + 4 = 20

5. Write short notes on :
 - (i) Closed loop and open loop
 - (j) Work Piece Zero and Machine Zero
 - (k) Part Program
 - (l) H.S.S5X4 = 20

[Turn over

GROUP – B

6. How measuring instruments could be classified ? Explain different types of errors . What are the sources of errors ? Discuss in detail. Explain controllable error . $5 + 5 + 5 + 5 = 20$
7. (a) Explain limit gauge micrometer and bench micrometer with necessary diagram.
(b) Why "V" block is used in machine shop ? Explain the method of mounting the work piece on the "V" block in detail. $10 + 10 = 20$
8. (a)What are the different types of surface irregularities observed during machining process? (b) Discuss different methods of measuring effective diameter or pitch diameter of an external thread. $8 + 12 = 20$
9. Write short notes on :
- (a) Plug and Snap Gauge
 - (b) Twist Flute Drill
 - (c) Vernier Depth Gauge
 - (d) Interchangeability

$5 \times 4 = 20$