ANNA UNIVERSITY COIMBATORE
B.E. / B.Tech. DEGREE EXAMINATIONS - DECEMBER 2008
THIRD SEMESTER – MECHANICAL ENGINEERING
MC 304 – MACHINE TOOL ENGINEERING

Time: Three Hours   **Maximum: 100 Marks**

PART A – (20 x 2 = 40 Marks)
Answer ALL Questions

1. Define "Tool life" .

2. What are the various types of tool wear that you know?

3. While machining a brittle material, what type of chip will be formed?

4. What are the different types of machining operations that can be performed in a centre lathe ?

5. Write the formula and also calculate the change gears required for cutting a single start thread in centre lathe having pitch of 1.5 mm and diameter 50 mm and the pitch of the lead screw of the centre lathe is 6 mm.

6. Write notes on feed mechanism used in shaping machine?

7. Mention the names of the cutting tool materials that you know.

8. Name any two mass production lathes that you know.

9. What is the difference between a blind hole and a through hole?

10. What is broaching?

11. What is grit, grade and structure of a grinding wheel?

12. What is dressing of a grinding wheel?

13. What is indexing?

14. What are the functions of index change gears in hobbing machines?

15. Mention any four types of bevel gears.

16. List out some of the work holding devices used in industry.

17. In the nontraditional machining methods, what are the different types of energy used?

18. In the nontraditional machining methods, what are the various mechanism for removal of chips?

19. What are the limitations of abrasive jet machining?

20. What are the applications of laser beam machining in automobile industry?

PART B (5 × 12 = 60 Marks)
Answer Any FIVE Questions

21. a) Draw and explain Merchant's circle diagram.

    b) The Tailor's tool life equation for machining C40 with a 18:4:1 HSS Cutting tool at a feed of 0.2 mm/min and a depth of cut of 2 mm is given by $VT^n = C$, where n and c are constants. The following V and T observations have been noted :

        V m/min = 25   35

        T min   = 90   20

        Calculate :

        (i) n and C

        (ii) Recommend a suitable cutting speed for a desired tool life of 60 min.

22. a) Explain the various methods of taper turning that can be done in centre lathe?

    b) Draw and explain the working principle of single spindle automatic lathe.

23. a) Explain the constructional features of Radial Drilling Machine with a neat sketch.

    b) What are the specifications of a grinding stone?

24. a) Explain the constructional features and its three important purpose of universal dividing head used in milling machine for holding Gear Blanks to cut gear tooth spaces using forming process.

    b) Explain the principle of generation of gear tooth profile in gear hobbing process.

25.(a) What are the advantages of laser beam machining?

(b) Explain with the sketch, the ultrasonic machining and state its advantages and its disadvantages.

26.(a) Distinguish between Capstan lathe and Turret lathe.

(b) Explain with the sketch, the mechanism of imparting speed motion to the single point tool in shaping machine.

27.(a) Explain with the sketch, the universal type tool and cutter grinder.

(b) What are the advantages and limitations of Broaching.

28.(a) Discuss the various aspects which are responsible for the correct selection of the nontraditional machining methods.

(b) Discuss about machinability and machinabilty index.

******THE END******