BT-3/D-19   33026

PRODUCTION TECHNOLOGY-I
ME-209E

Time : Three Hours]   [Maximum Marks : 100

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit.

Unit I

1. (a) In an orthogonal cutting (turning) operation on a lathe the cutting tool used has the tool designation of 0-10-6-6-8-80-1 mm in ORS system. Calculate the values of (i) Back Rack and (ii) Side Rack. **12**

   (b) How is the chip formed in Metal Cutting ? Explain the terms shear plane and shear zone.   **8**

2. In a plain milling operation on a mild steel block, the following data are collected : cutting speed = 30 m/min, feed velocity = 72 mm/min, diameter of cutter = 70 mm, no. of teeth in cutter = 8, width of cut = 80 mm, and depth of cut = 5 mm. Take the average cutting pressure for the given material = 375 kg.

Calculate the rotational speed of the cutter, maximum chip thickness, average area of chip cross section, the peripheral force and the power required for cutting. **20**

Unit II

3. (a) Discuss the effect of variations in cutting speed on various cost factors.   **10**

   (b) Why a flat drill is considered obsolute in modern drilling practice while it is the cheapest of all the drills ?   **10**

4. (a) What are the principle dimensions of a twist drill ? Show these dimensions on neat sketch of a twist drill.   **10**

   (b) At what speed a 15 mm dia. Drill will run, to drill a hole through a brass plate 20 mm thick, in order to cut the material at a surface speed of 60 m.p.m. Also calculate the feed used, per rev.   **10**

Unit III

5. Calculate the drawing load required to obtain 30% reduction in area on a 12 mm diameter copper wire. The following data is given : σ° = 240 N/mm², 2α = 12°, *coefficient of friction = 0.10. And also calculate the power of the electric motor if the drawing speed is 2.3 m/s. Take efficiency of the motor as 98%.   **20**

6. (a) What do you mean by locating and clamping a
        work piece ?   10

    (b) Name the essential features of a milling fixture. 10

Unit IV

7. (a) How are the various standard of measurement
        classified ? How primary standard differ from
        working standards ?   10

    (b) Discuss mechanical and electrical comparators in
        detail. http://www.kuonline.in   10

8. (a) State and explain the Taylors principle for gauge
        design.   10

    (b) What are the purposes of lapping and honing ?10