



- Notes :
1. All questions carry marks as indicated.
 2. Solve Question 1 OR Questions No. 2.
 3. Solve Question 3 OR Questions No. 4.
 4. Solve Question 5 OR Questions No. 6.
 5. Solve Question 7 OR Questions No. 8.
 6. Solve Question 9 OR Questions No. 10.
 7. Solve Question 11 OR Questions No. 12.
 8. Due credit will be given to neatness and adequate dimensions.
 9. Assume suitable data whenever necessary.
 10. Illustrate your answers whenever necessary with the help of neat sketches.

1. a) Describe & sketch the tool geometry of a single point cutting tool. Describe the importance of each angle ground on it. **7**
- b) Explain with neat sketches between oblique and orthogonal cutting. **6**
- OR**
2. a) Explain with neat sketch of different types of chips produced during metal cutting? What variable affecting tool life. **5**
- b) In an orthogonal cutting process, the following observation are made : uncut chip thickness = 0.127 mm, width of cut = 6.35 mm, cutting speed = 4.5 m/s, Rake angle = 20°, cutting force = 570 N, Thrust force = 230 N, chip thickness = 0.228 mm. Determine shear angle, friction angle, shear stress, along the shear plane and the power for cutting operation. Also find chip velocity and shear strain in chip. **8**
3. a) Describe the geometry of milling cutter. Explain its various design parameters. **7**
- b) What is Broach? Explain its geometry and describe its various design Element. **7**
- OR**
4. a) Explain with neat sketch of Geometry of twist drill. **6**
- b) A hole is drilled in a mild steel plate using a twist drill of 28 mm diameter. The following data is recorded during the experiment.
Vertical force = 80 kg, Cutting force at the ups = 50 kg, feed rate = 0.5 mm/rev, Rotational speed of drill = 600 rpm. Assuming value of "C" for mild steel equal to 0.36, Calculate the thrust force, torque acting on the drill and power required for drilling. Neglect frictional effect. **8**
5. a) What is Press Working? Explain with neat sketches various press working operation. **7**
- b) 'Punch Controls hole size and die control blank size' Explain with neat sketch. **6**

OR

6. a) Find the total pressure, Dimensions of tools to produce a washer 80 mm outside diameter with a 32 mm diameter hole from material 3.5 mm thick having a sheet strength of 320 N/mm^2 . 7
- b) Write short notes on **any two**. 6
- i) Compound die
- ii) Progressive die
- iii) Transfer dies.
7. a) What is 'Spring back' in bending operation? Explain the various methods of combating spring back in bending. 6
- b) Explain with neat sketch difference between Drawing & Curling operation in press working. 7
- OR**
8. a) Distinguish between V. Bending and Edge bending? What for bottoming is done? Explain. 5
- b) A cup having internal diameter 50 mm and height 50 mm is to be manufactured from CRCA steel sheet of SAE 1010. Thickness is 1 mm. Calculate the blank size, no. of draws, sizes of punches. 8
9. a) Explain in brief various forming operation. State the application of each. 7
- b) Describe the various preliminary operations done on a multi – impression die. 6
- OR**
10. a) Explain the detail procedure for designing forging die. 7
- b) Write short notes on **any two**. 6
- i) Fullering.
- ii) Flattering.
- iii) Blacking.
11. a) Explain with neat sketch the 3 – 2 – 1 principle of location. 7
- b) Describe different types of locators with neat sketches. 7
- OR**
12. a) What is a Jig and a fixture? Discuss the design principle consideration for Jigs and fixture. 8
- b) Explain with neat sketch of indexing fixture. 6
