



22565

12223

3 Hours / 70 Marks

Seat No.

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- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Assume suitable data, if necessary.
 - (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE :

5 × 2 = 10

- (a) Define “Chip reduction coefficient”.
- (b) What is meant by press tonnage ?
- (c) List out desirable characteristics of cutting tool material.
- (d) What is the importance of strip layout in press working ?
- (e) Define jigs and fixtures.
- (f) State the function of locating devices.
- (g) Define bending. List various methods.

2. Attempt any THREE :

3 × 4 = 12

- (a) Explain the mechanics of metal cutting with a simple sketch.
- (b) How carbide tipped tools are specified ? Name coating material used on it.
- (c) Explain with a neat sketch the importance of “scrap strip layout”.
- (d) Explain the construction of an “adjustable step clamp” of a milling machine.



3. Attempt any THREE : **3 × 4 = 12**

- (a) What is bend allowance in bending die ? How is the bend allowance determined ?
- (b) Explain the “3-2-1” principle of location with a neat sketch.
- (c) What is spring back in bending operation ? State its causes.
- (d) Classify cutting dies. List their applications.
- (e) State importance of “clearance” between die and punch. Explain method of calculation of clearance for blanking operation with example.

4. Attempt any TWO : **2 × 6 = 12**

- (a) Draw the merchant force circle diagram and list the forces acting on cutting tool and work piece during machining.
- (b) Explain in detail “tool sharpening method” for single point cutting tool.
- (c) Explain term degree of freedom. State the importance while selecting, locating and clamping devices.

5. Attempt any TWO : **2 × 6 = 12**

- (a) The washer of 45 mm outside diameter and 20 mm inside diameter are to be made by press operation from M.S. sheet of 1.7 mm thickness.

Calculate :

- (i) Clearance,
- (ii) Size of punch & die
- (b) Explain the procedure of Designing fixtures for milling machines in detail.
- (c) A 90° bend is to be made from steel sheet in an air bending type die. A bend length is 30 cm, the stock thickness is 3 mm and beam length is 4 cm. Find the bending force required if the ultimate tensile strength of stock material is 1500 N/mm² and die opening factor is 1.33.

6. Attempt any TWO :

 $2 \times 6 = 12$

- (a) Explain with neat sketch construction and working of progressive die for the manufacturing of any simple component.
- (b) Explain with a neat sketch the most commonly used turning as well as drilling fixture.
- (c) A shell shown in figure 1 has a height of 48 mm and a diameter of 48 mm. The corner radius is 2 mm and the work piece material is medium carbon steel and is 1 mm thick.

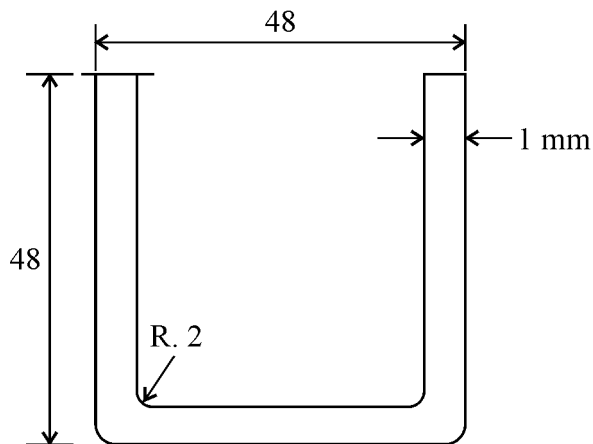


Fig. 1

Calculate :

- (i) blank diameter,
(ii) Number of draws,
(iii) Radius on punch and die.
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