17615

15116

3 Hours / 100 Marks Seat No. | | | | | | | | |

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. a) **Attempt any THREE of the following:** **12**

(i) Discuss basic elements of metal cutting.

(ii) State the requirements of tool materials.

(iii) Give at least five parts of OB1 press. State its uses.

(iv) What do you understand by spanking?

b) **Attempt any ONE of the following:** **6**

(i) Explain orthogonal cutting with a neat sketch.

(ii) Define the terms related to forging die. Scale loss, draft angles, fillet and corner radii, parting lines and mismatch.

Marks

2. Attempt any FOUR of the following: **16**

a) During turning a mild steel component with a 0-10-7-7-8-9-1.5 mm shaped orthogonal shaped tool a depth of cut of 1.8 mm is used. If feed is 0.18 mm/rev. and a chip thickness of 0.36 mm is obtained. Determine:

(i) Chip thickness ratio

(ii) Shear angle

b) State the various conditions for the effective use of carbide tips.

c) What are the essential characteristics of cutting fluids?

d) Explain combination die with neat sketch.

e) What is extrusion? Explain forward extrusion with neat sketch.

3. Attempt any TWO of the following: **16**

a) What are the types of chips? Explain each with neat sketch.

b) A part shown in Figure No. 1 is to be made from a mild steel sheet 3 mm thick and 2 m long. Determine stock layout, number of parts punched from the strip and material utilization factor.

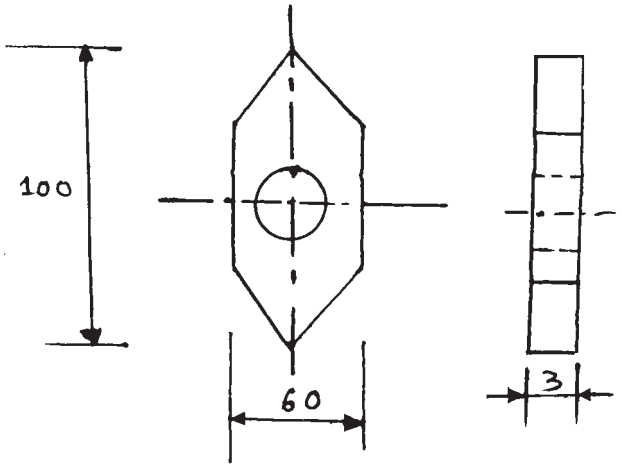


Fig. No. 1

c) Explain the various factors that affect the metal flow during drawing.

Marks

4. a) **Attempt any <u>THREE</u> of the following:** **12**

(i) State the general rules for using positive and negative rake angles.

(ii) Explain the spring loaded stripper with neat sketch.

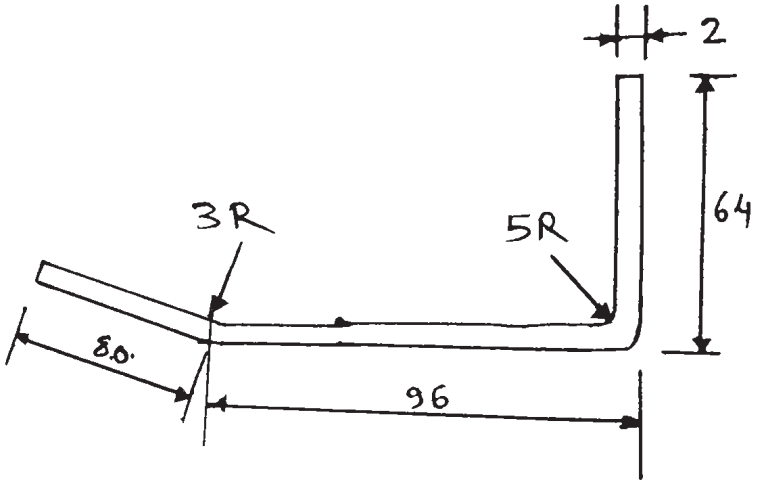
(iii) What are the methods of bending? Explain any one with neat sketch.

(iv) What is forging? Discuss press and up-setting forging.

b) **Attempt any <u>ONE</u> of the following:** **6**

(i) What are the types of tool material? State atleast two applications of each.

(ii) Calculate the blank length to make the part as shown in Figure No. 2



<u>Fig. No. 2</u>

5. **Attempt any <u>FOUR</u> of the following:** **16**

a) What are the types of cutting fluids? State its applications.

b) Draw a neat sketch of nomenclature of single point cutting tool.

c) What is meant by notching, cropping, lancing and coining?

Marks

d) Which member should be given clearance? Explain.

e) What do you understand by set back and bend allowance?

f) Draw the diagram of drawing operation. State the function of pilot and knock out.

6. Attempt any TWO of the following: **16**

a) What is tool life? Write its equation. Explain the factors affecting tool life.

b) A shell shown in Figure No. 3 has a height of 48 mm and a diameter of 48 mm. The corner radius is 2 mm and workpiece material is medium carbon steel and is 1 mm thick. Calculate:

(i) Blank diameter

(ii) Percentage reduction

(iii) Number of draws

(iv) Radius on punch and die

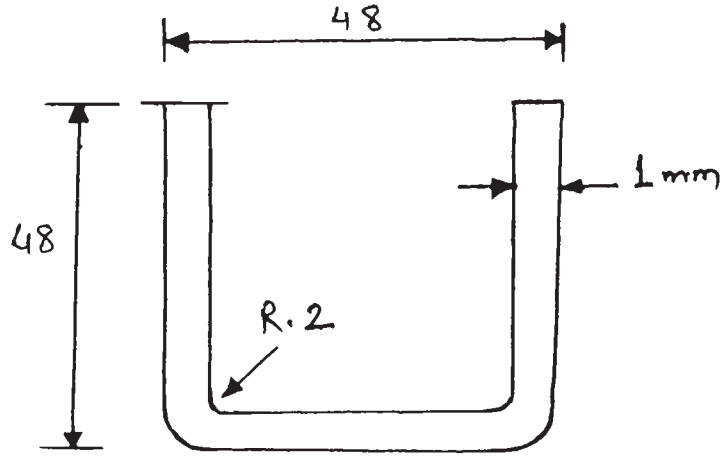


Fig. No. 3

c) Calculate punch and die size of a steel washer 30 mm outside diameter with 15 mm hole from 1.6 mm thick steel sheet. The ultimate shear strength of the material is 32 kg/mm^2. The washer is made on progressive die. Assume 70% efficiency.