

17615

11819

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.

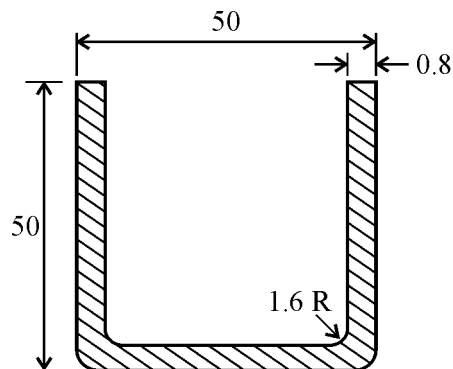
- | | Marks |
|--|--------------|
| 1. (A) Attempt any THREE of the following : | 12 |
| (a) State the requirements of tool. | |
| (b) What is tool life ? Write the factors on which tool life depends. | |
| (c) Differentiate between Compound die and Combination die. | |
| (d) What is spring back ? How it can be over come ? | |
| (B) Attempt any ONE of the following : | 6 |
| (a) Explain Merchant force Circle with its assumptions. | |
| (b) With neat sketch describe following in case of forging die. | |
| (i) Draft, (ii) Fillet, (iii) Corner radii | |
| 2. Attempt any FOUR of the following : | 16 |
| (a) Explain mechanics of metal cutting operation with the help of neat sketch. | |
| (b) Explain in brief characteristics of tool material. | |
| (c) Explain strip layout with proper example. | |
| (d) State the factor affecting tool wear. | |
| (e) Explain backward extrusion with neat sketch. | |
| (f) List the different die mounting. Explain spring type stripper. | |

- 3. Attempt any TWO of the following : 16**
- (a) State factors on which bending pressure depends. How the size of a blank is calculated for drawing a cup ?
 - (b) How OBI press is to be specify ? Explain compound die with neat sketch.
 - (c) During machining of C-25 steel with 0 – 10 – 6 – 6 – 8 – 90 – 1 mm (ORS) shaped triple carbide cutting tool, the following observation have been made :
Depth of Cut = 2 mm, feed = 0.2 mm/rev, Speed = 200 m/min, Tangential cutting force = 1600 N Feed thrust force = 850 N, Chip thickness = 0.39 mm.
Calculate : (i) Shear force
(ii) Normal force at shear plane
(iii) Friction force
(iv) Kinetic co-efficient of friction.
- 4. (A) Attempt any THREE of the following : 12**
- (a) Explain the principle of closed die forging with neat sketch.
 - (b) State the essential characteristics of cutting fluid.
 - (c) List the methods of bending. Explain any one with neat sketch.
 - (d) State the functions of Pilot, misdeed detector, pressure pads & knock out.
- (B) Attempt any ONE of the following : 6**
- (a) State six die operations with suitable sketch.
 - (b) Differentiate between orthogonal and oblique cutting. (At least six points)
- 5. Attempt any FOUR of the following : 16**
- (a) Draw a neat sketch of a geometry of single point cutting tool.
 - (b) List the different types of cutting fluid with its application.
 - (c) Explain drawing operation with neat sketch.
 - (d) Explain spanking with neat sketch.
 - (e) The useful tool life of a HSS tool machining mild steel at 18 m/min. is 3 Hrs. Calculate the tool life when the tool operates at 24 m/min.
 - (f) Explain variables affecting metal flow during drawing.

6. Attempt any TWO of the following :

16

- (a) List the different types of ceramic coatings ? Write the specification of carbide tips. Why heat treatment is given to tool steel ?
- (b) The Symmetrical cup work piece as shown in figure is to be made from Cold rolled steel 0.8 mm thick. Calculate :
- Size of blank
 - % Reduction
 - No. of draws
 - Radius of Punch and die.



- (c) A washer with 12.7 mm internal hole and an outside diameter of 25.4 mm is to be made from 1.5 mm thick strip of 0.2% carbon steel. Considering the elastic recovery of material. Find :
- clearance
 - blanking die opening size
 - The blanking punch size
 - Piercing punch size.

