

22565

21222

3 Hours / 70 Marks

Seat No.

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15 minutes extra for each hour

- Instructions :**
- (1) All Questions are *compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.

Marks

1. Attempt any FIVE of the following :

10

- (a) Define 'Shear angle'.
- (b) Define 'Press working'.
- (c) State ISO designations of tool holders.
- (d) State the function of 'Clamping' in relation with jigs and fixtures.
- (e) List the applications of 'Jigs'.
- (f) State applications of press working process.
- (g) State the applications of Drawing dies.

2. Attempt any THREE of the following :

12

- (a) State the conditions in which discontinuous chips are produced; even if the material is ductile.
- (b) State four types of cutting tool materials with their applications.
- (c) Explain construction and working of 'C' clamp with sketch.
- (d) State the reasons to use Jigs & Fixtures.

3. Attempt any THREE of the following :

12

- (a) Define centre of pressure and state its significance.
- (b) Explain : (i) Embossing (ii) Swaging
- (c) Explain the method of application of die clearance in
(i) blanking operation (ii) punching operation.
- (d) Explain '3-2-1' principle of location with neat sketch.
- (e) Describe any one type of forging die.

4. Attempt any TWO of the following :

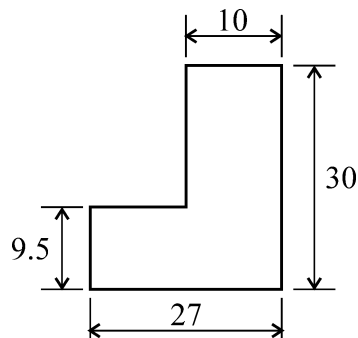
12

- (a) During machining of C-25 steel with 0-10-6-6-8-90-1 mm (ORS), shaped tripple carbide cutting tool, the following observations 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. Calculute,
 - (i) Shear force
 - (ii) normal force at shear plane
 - (iii) friction force
- (b) Explain with suitable sketch "Tool sharpening method for single point cutting tool."
- (c) Sketch conical and cylindrical locating pin with work piece. (any four)

5. Attempt any TWO of the following :

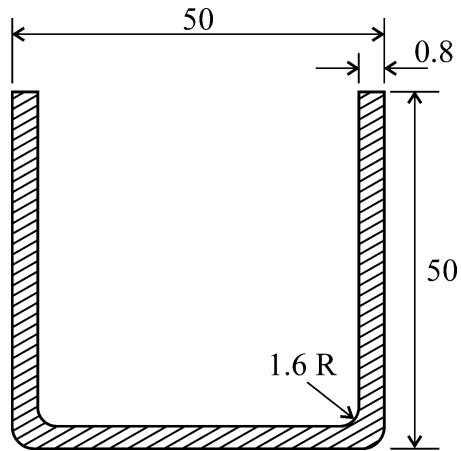
12

- (a) Sketch a suitable Jig for drilling radial hole on a pipe. Label it's components.
- (b) Find the centre of pressure of the following blanked shape shown in figure.



All dimensions are in cm.

- (c) The symmetrical, cylindrical cup workpiece shown in figure below is to be made from cold rolled steel 0.8 mm thick. Make necessary calculations for designing the drawing die for this part to find out.
- size of blank (diameter)
 - no. of draws
 - radius on punch



All dimensions are in mm

6. Attempt any TWO of the following :

12

- Differentiate jigs & fixtures with sketch and state any three design principles specific to milling fixtures.
- Estimate the blanking force to cut a blank 25 mm wide and 30 mm long from a 1.5 mm thick metal strip, if the ultimate shear stress of the material is 450 N/mm². Also determine the work done if the percentage penetration is 25 percent of material thickness.
- Draw the general assembly sketch of 'Progressive Die' showing all the components.
