# 17615

**16117**

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

*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.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

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

(i) Write any four properties of cutting fluid.

(ii) Describe any four factors affecting tool life.

(iii) What are different types of tool materials? Define hot hardness of tool material.

(iv) Explain bending operation with neat sketch.

**Marks**

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

(i) With neat and labelled sketch explain cutting tool geometry of single point cutting tool.

(ii) With neat sketch describe following with respect to forging die.

1) Draft

2) Fillet

3) Corner radii

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

a) With neat sketch explain orthogonal cutting and oblique cutting.

b) What is cutting fluid? What are it's functions in cutting process?

c) With neat sketch explain any two types of chips.

d) Give classification of presses. State how size of press is explained.

e) Explain material utilization factor and percentages utilisation and percentage scrap.

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

a) (i) Define:

1) Cutting speed

2) Feed

3) Depth of cut in case of machining process

(ii) Find the time required for are complete cut on piece of work 350 mm long and 50 mm in diameter. The cutting speed is 35 meters per minute and the feed is 0.5 mm per minute.

b) Write general characteristics of tool materials any four.

c) Explain with neat sketch the difference between punching and blanking operation.

**Marks**

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

(i) Define back rake angle and side rake angle and draw its figure.

(ii) Give specification of carbide cutting tool material. State the advantages and carbide tipped tools.

(iii) Explain how press size is designated with suitable example.

(iv) State functions of following in dies and punch:

1) Stop

2) Guide bush

3) Guide pins

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

(i) Explain combination dies with neat sketch.

(ii) What is spanking phenomena in case of bending dies? Describe with neat sketch.

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

a) Calculate the tool life when tool operates at a linear speed at 20 m/min. The useful tool life of 16 m/min is 3 hours. Assume tool life exponential $n = 0.125$.

b) State advantages and limitations of compound dies.

c) Explain with neat sketch button stop and lever stop.

d) Draw neat sketch for direct extrusion and describe the process.

e) Define forging. Write principle of cold die forging with neat sketch.

f) What is drawing? Describe with neat sketch and state any two factors affecting drawing.

**Marks**

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

a) A sheet of 75 mm diameter is to be drawn and its height has to be 200 mm calculate the:

(i) Diameter of blank

(ii) The % reduction for each draw.

(iii) Calculate no. of draws.

(iv) Radius on punch and die.

b) Figure No. 1 shows one of the die assembly. Observe it carefully and answer the following:

(i) Redraw the figure and name different parts

(ii) Identify the type of die.

(iii) Describe working principle of die.

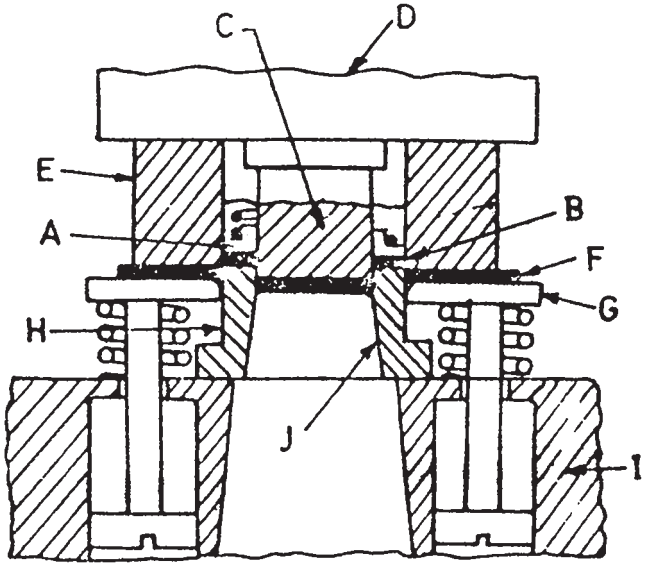


**Fig. No. 1**

c) (i) What is die casting?

(ii) Define gravity die casting and pressure die casting.

(iii) Give applications of die casting any four