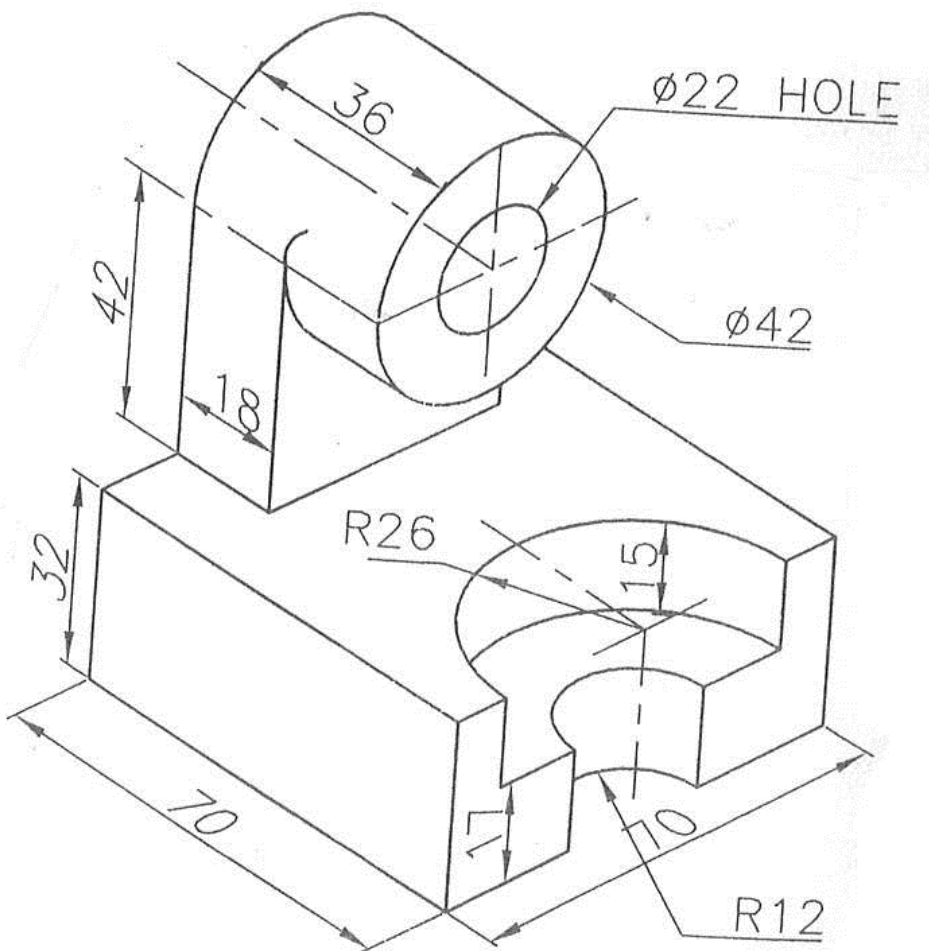


1. Figures to the right indicate full marks.
2. Attempt any four questions including Question No.1 is compulsory.
3. Illustrate answers with sketches if required.
4. Assume any suitable data wherever necessary.

Q.No.1. The component shown in the figure no.1 is to be sand cast. Material of the component is steel. Assuming suitable data answer the following: 20

- a). Select parting line.
- b). Design and sketch the required pattern and core boxes.
- c). Design the gating system.
- d). Calculate the required size of riser using Caines's method.
- e). Sketch the views of mold showing gating system and riser.



(All dimensions are in mm)

Figure 1

**P.T.O.**

Q.No.2. Answer the following: 20

- a). Difference between pattern and mold.
- b). Explain working principle of double stroke air operated hammer.
- c). Chills are used in sand mold casting process.
- d). Explain working principle of squeeze molding process.
- e). Discuss about Thixo- casting process.

Q.No.3. Give reasons for the following: 20

- a). Pressurized gating system is not used in steel casting
- b). Presses are used in manufacturing of thinner forgings.
- c). Forgings are inherently stronger than casting.
- d). Pressure required for forward extrusion is more as compared to backward extrusion.
- e). Double allowance is provided on master pattern..
- f). Flow-offs are used in pressure die casting process.
- g). Fillet and corner radii are provided on forging dies.
- h). Saw dust is used in forging operation.

Q.No. 4. Answer the following.

- a). Explain hot box casting process. 05
- b). Discuss working principle of petro forging machine. 05
- c). How parting line is selected in forging die? 05
- d). What are pre-forming operations carried out in multi-impression forging? Explain their purpose. 05

Q.No. 5. Write a note on: 20

- a). Pattern allowance.
- b). Planetary roll mill.
- c). Hydrostatic extrusion process.
- d). Defects in rolled product.
- e). Types of cores.

Q.No. 6. Answer the following

- a). Explain defects in casting products. 06
- b). How seamless tubes are manufactured in rolling process? 05
- c). Define moldability, collapsibility, permeability and grain fineness number 04
- d). How grain fineness number (GFN) of moulding sand is tested? 05

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