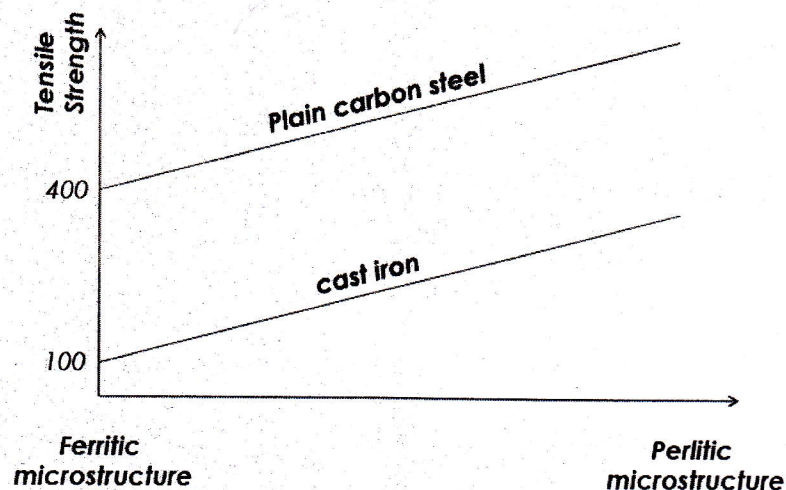


Section I. Fourteen (14) Compulsory questions

55 marks

- 01.** Inscribe a regular octagon in the circle of 25mm of radius. **4 marks**
- 02.** What is malleability property of material? **3 marks**
- 03.** List out any five physical property of material. **5 marks**
- 04.** Draw angle OMN of 65° and make bisect of that angle. **4 marks**
- 05.** Identify five among different types of cast iron. **5 marks**
- 06.** The graph below shows tensile strength versus perlitic microstructure of cast Iron as mechanical properties of cast iron. List at least one (1) graphite's effect on tensile strength. **2 marks**



- 07.** Define drawing. **2 marks**
- 08.** State two types of drawing and give four subtypes of engineering drawing. **4 marks**
- 09.** Define a tangent to a circle. Draw a tangent to a circle from any point on the circumference by given a radius of cycle $R= 30$ mm. And says in briefly ways of its construction. **6 marks**
- 10.** Write in fully and correctly the sentence by filling in the following statements. **5 marks**
 - **Metal which contains Iron is called.....**
 - Non- ferrous metal
 - Ferrous metal
 - Alloy metal
 - Non-metal material

- **Cast iron is an example for.....**
 - Alloy metal
 - Non-ferrous metal
 - Ferrous metal
 - Non-metal material
- **Steel is an example for**
 - Non-metal material
 - Ferrous metal
 - Alloy metal
 - Non-ferrous metal
- **Aluminium is an example for**
 - Non-metal material
 - Ferrous metal
 - Alloy metal
 - Non-ferrous metal
- **Brass belongs to**
 - Non-ferrous metal
 - Non-metal material
 - Ferrous metal
 - Alloy metal

11. Give the functions of the following drawing instruments:

- a) Compass:
- b) French Curves
- c) T-square:
- d) Protractor:
- e) Divider:

5 marks

12. What is meant by sectioning?

2 marks

13. What is "direction of sight" in sectioning?

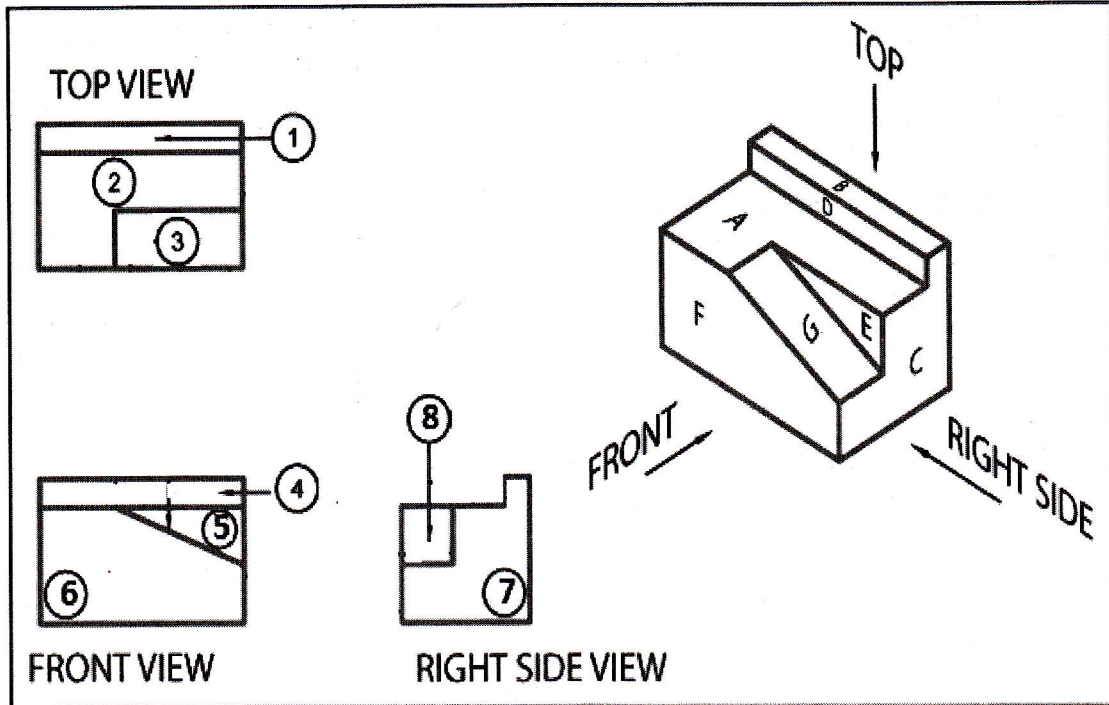
3 marks

14. Construct three circles, each one touching the other two externally, their radii being 12, 18 and 24 mm, respectively.

5 marks

15. 3-D pictorials of two objects are shown with labeled surfaces. Identify those surfaces on the corresponding 2-D orthographic projections.

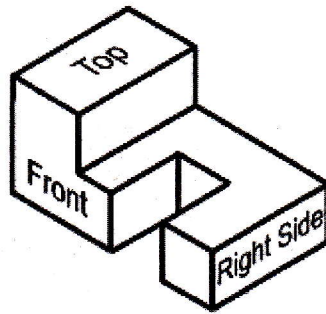
10 marks



Surface Number	Enter Corresponding Surface Letter
1	
2	
3	
4	
5	
6	
7	

16. Draw the Top view, Front view, Left view for the following isometric view. First-angle projection.

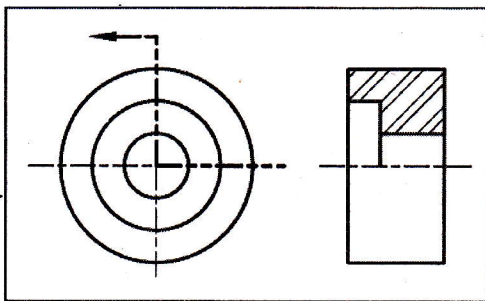
10 marks



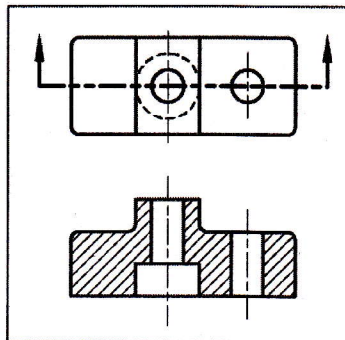
3D Representation

17. Identify which type of section each of the drawings use and the material that the part is made from for A, B, C.

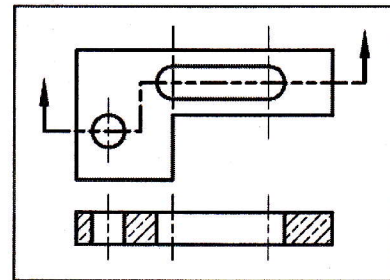
10 marks



A



B



C

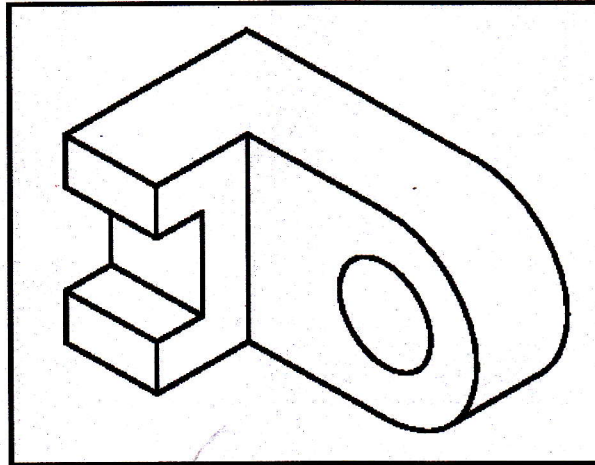
18. Classify plastic materials into two categories, describe their important properties and give two examples of each.

10 marks

19. Give the distinctive features, limitations, and applications of the following alloy groups: titanium alloys, refractory metals, superalloys, and noble metals.

10 marks

20. Sketch the front, top and right side views of the following object.



21. Compare white and nodular cast irons with respect to

- a) composition and heat treatment,
- b) microstructure,
- c) Mechanical characteristics.

22. Draw common external tangents to circles of diameters 60 mm and 32 mm whose centers are located 80 mm apart.