

ADVANCED LEVEL NATIONAL EXAMINATIONS, 2017, TECHNICAL AND PROFESSIONAL STUDIES

EXAM TITLE:

TECHNICAL DRAWING AND KNOWLEDGE OF MATERIALS

OPTIONS: Computer Electronics (CEL) Electronics and Telecommunication (ETL) DURATION: 3 hours

INSTRUCTIONS:

The paper is composed of three (3) main Sections as follows:

Section I: Fourteen (14) compulsory questions.	55 marks
Section II: Attempt any three (3) out of five questions.	30 marks
Section III: Attempt any one (1) out of three questions.	15 marks

Note:

Every candidate is required to carefully comply with the above instructions. Penalty measures will be applied on their strict consideration.

Use drawing materials where required.

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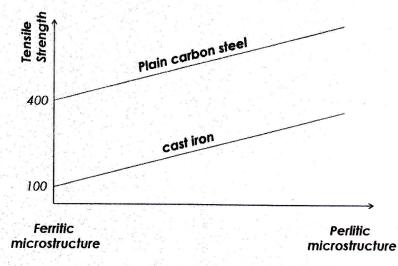
Section I. Fourteen (14) Compulsory questions

55 marks

2 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 leas	st one (1)

graphite's effect on tensile strength.



07. Define drawing.

O8. State two types of drawing and give four subtypes of engineering drawing.4 marks

- O9. 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

2 marks

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

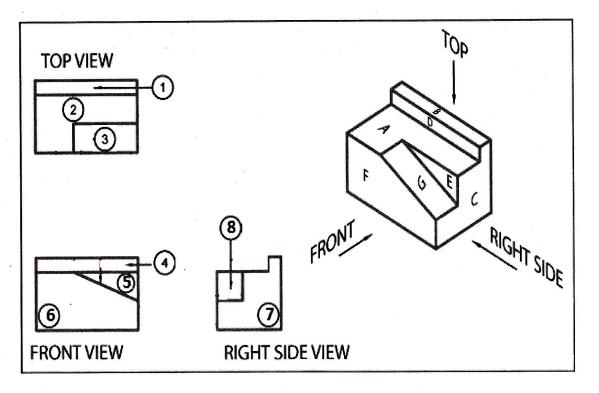
11. Give the functions of the following drawing instruments:

- 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 04	marks

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

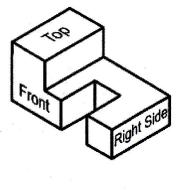
10 marks



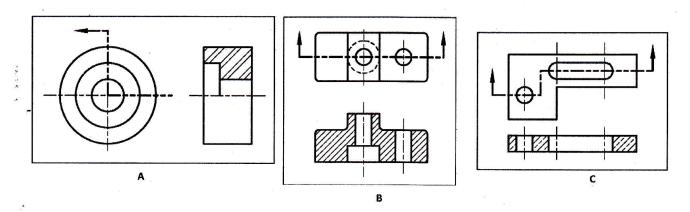
Surface Number	Enter Corresponding Surface Letter
1	
2	
3	
4	
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6	
.7	

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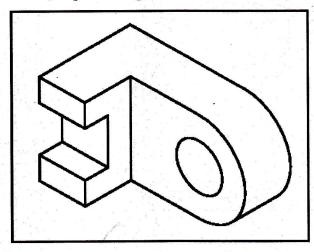
16. Draw the Top view, Front view, Left view for the following isometric view. First-angle projection.10 marks



- **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



- 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.