

**071305T4EOP**

**Electrical Installation Level 5**

**Prepare and Interpret Technical Drawings**

**ENG/OS/EI/CC/03/5/A**

**Nov. /Dec. 2022**



**THE KENYA NATIONAL EXAMINATIONS COUNCIL**

**WRITTEN ASSESSMENT**

**TIME: 3 HOURS**

**CANDIDATE INSTRUCTIONS**

1. The paper consist of section **A**, **B** and **C**, answer **ALL** the questions in section **A** and in section **B** and any **TWO** questions from section **C**
2. You are provided with drawing papers size A2.
3. Provide all your personal details including name, registration code, date and signature in the title block.
4. Do not write on the question paper.
5. Marks for each question are indicated in the brackets ( )

***This paper consist of nine (9) printed pages***

The following resources will be required during the assessment:

- *Drawing board*
- *Drawing paper size A2*
- *T-square*
- *HB and 3H Pencil*
- *Set squares*
- *Drawing room*
- *30 cm ruler*
- *Eraser*
- *Sharpener*
- *Engineering drawing set*
- *Masking tape*

**SECTION A: (20 MARKS)**

**Instruction: Answer all the questions in this section**

1. Different types of pencils are normally used for specific uses and areas in drawing. Which one of the following types of pencils is used while drawing an outline? **(1 mark)**
  - A. 2H
  - B. 3H
  - C. HB
  - D. 4H
  
2. Select the type of drawing in which freehand representation makes use of pictures to provide a general impression of the object being drawn. **(1 mark)**
  - A. Circuit diagram
  - B. Artistic drawing
  - C. Schematic diagram
  - D. Technical drawing
  
3. Technical drawing is said to be a technological language which is well understood by engineers; which of the following line drawing type represents a centerline of a circle drawing? **(1 mark)**
  - A. Faded straight line to the end
  - B. Long-Dashed Dotted Narrow Lines
  - C. Dotted line
  - D. Bold line
  
4. One of the following is a view in orthographic projection, which one is it? **(1 mark)**
  - A. Plan
  - B. Third angle
  - C. First angle
  - D. Isometric projection
  
5. There are many types of technical drawings, which one is not: **(1 mark)**
  - A. Plan drawing
  - B. Working drawing
  - C. Assembly drawing
  - D. Draft

6. Which one of the following actions can be performed by scrolling of the mouse in AutoCAD? **(1 mark)**
- A. Zoom in/ zoom out
  - B. Dimension
  - C. Delete
  - D. Print
7. Neatness in drawing activities is crucial and define the quality of a drawing. Which drawing activity among these mentioned does not promote neatness while drawing? **(1 mark)**
- A. Using a soft eraser while erasing or rubbing
  - B. Using a sharp pencil without dirt and graphite particles
  - C. Using clean sliding tools
  - D. Direct contact with the drawing paper with oily hands
8. A line shows its dimension as 14.52. What is the precision of this line? **(1 mark)**
- A. [0.0]
  - B. [0.00]
  - C. [0.000]
  - D. Display of length has nothing to do with precision.
9. Select the size of an A2 drawing sheet **(1 mark)**
- A. 1189 x 841mm
  - B. 594 x 420mm
  - C. 420mm x 297mm
  - D. 297 x 210mm
10. The primary unit of measurement for engineering drawings and design in mechanical industries is: **(1 mark)**
- A. Meter
  - B. Centimeter
  - C. Millimeter
  - D. Kilometer

11. The \_\_\_\_\_ tool on the dimension toolbar in AutoCAD places the length of an arc on a drawing **(1 mark)**
- A. Arc radius
  - B. Arc length
  - C. Radius
  - D. Diameter
12. How many sides does a regular heptagon have? **(1 mark)**
- A. 12
  - B. 11
  - C. 7
  - D. 9
13. Which of the following is not a locus? **(1 mark)**
- A. Ellipse
  - B. Cycloid
  - C. Tangent
  - D. Involute
14. The following are equipment used in Technical Drawing. Which equipment is used in measuring of angles? **(1 mark)**
- A. Protractor
  - B. French curve
  - C. T-Square
  - D. Drawing board
15. The angle which cannot be made using a single set square is? **(1 mark)**
- A.  $45^\circ$
  - B.  $60^\circ$
  - C.  $30^\circ$
  - D.  $75^\circ$
16. Which type of section is limited by a break line? **(1 mark)**
- A. Broken-out section
  - B. Revolved section
  - C. Removed section
  - D. Half section

17. A square is held  $30^\circ$  with horizontal plane and turned  $30^\circ$  with respect to vertical plane.

Keeping earlier conditions constant, the plan view will be?

**(1 mark)**

- A. Rectangle
- B. Parallelogram
- C. Rhombus
- D. Square

18. In AutoCAD you can draw an ellipse by specifying these:

**(1 mark)**

- A. The bounding lines
- B. The center and the radius
- C. The mid and the end points
- D. The Center, major and minor axis

19. The UCS icon represent the intersection of the \_\_\_\_\_.

**(1 mark)**

- A. X axis
- B. Z axis
- C. Y axis
- D. All of the above

20. Which of the following is not a type of solid?

**(1 mark)**

- A. Prism
- B. trapezium
- C. Cone
- D. Cylinder

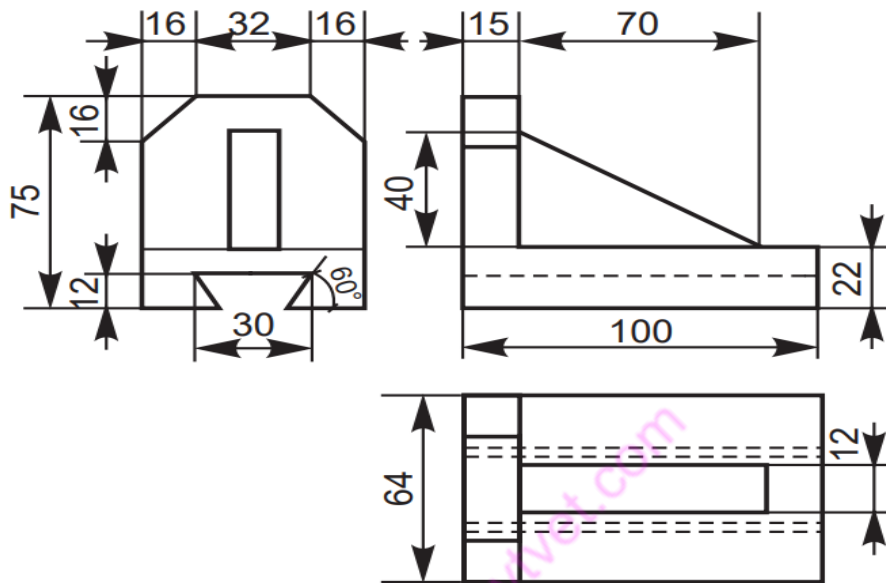
**SECTION B (40 MARKS)**

**Answer all the questions in this section**

21. Using freehand sketching draw:
- A. Long nose pliers
  - B. Ball-pein hammer **(4 marks)**
22. Construct an angle of  $30^{\circ}$  using a ruler and a compass only **(3 marks)**
23. Draw the lines ideal for following purposes:
- A. Center line
  - B. Visible outline **(2 marks)**
24. Construct an ellipse of major axis 90mm and minor axis 55 mm using concentric circle method. **(4marks)**
25. Construct a regular pentagon circumscribed by a circle diameter 100mm. **(4 marks)**
26. A circuit is made of two lighting points, L1 and L2, and three switches S1, switch S2 and switch S3. Draw a wiring diagram showing the two lighting points controlled at three separate positions **(4 marks)**
27. Construct an isosceles triangle that has a perimeter of 135 mm and an altitude of 55 mm. **(4marks)**
28. Construct the involute of a square given the sides as 25mm **(4marks)**
29. Construct an external tangent to two circles of diameter 40mm and 60mm and center distance 70mm. **(5 marks)**
30. Draw the following BS3939 symbols. **(4 marks)**
- a) Diode
  - b) Battery
  - c) Resistor
  - d) Light dependent resistor
31. Divide a line of 120mm in a ratio of 1:2:4 **(2 marks)**



33. Figure 2 shows orthographic views of an object in third angle projection. Draw the full-scale isometric view and insert all the dimensions. **(20marks)**



**Figure 2**



34. Figure 3 shows the front view of a cone truncated at  $30^\circ$ . The base diameter is 50mm and height is 65mm. Draw the development of the lateral surface of the truncated cone.

(20marks)

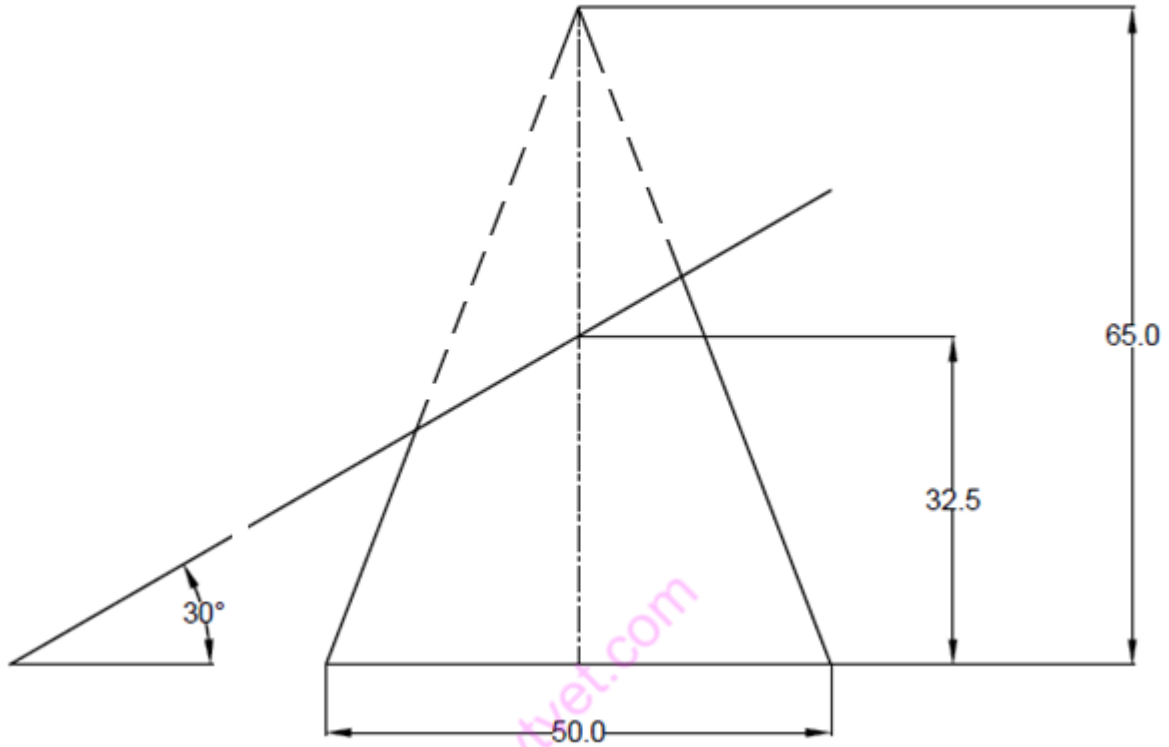


Figure 3

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