S6081 June
WASSCE 2008
TECHNICAL
DRAWING 1

2½ hours

1

Name:...

Index Number:...

THE WEST AFRICAN EXAMINATIONS COUNCIL
West African Senior School Certificate Examination

June 2008   TECHNICAL DRAWING 1   2½ hours

*Do **not** open this booklet until you are told to do so. While you are waiting, write your **name** and **index number** in the spaces provided at the top right-hand corner of this booklet and thereafter, read the following instructions carefully. This paper consists of **two** sections, A and B, answer Section A on your objective test answer sheet, and section B on the drawing paper provided. **Section A** will last for **1 hour** after which the answer sheet will be collected. Do **not** start Section B until you are told to do so. **Section B** will last for 1½ hours.*

SECTION A
OBJECTIVE TEST
[40 marks]

1 hour

1. Use **HB pencil** throughout.
2. If you have got a blank answer sheet, complete its top section as follows:
   (a) In the space marked *Name,* write in capital letters your **surname** followed by your **other names**.
   (b) In the spaces marked *Examination, Year, Subject* and *Paper,* write '**WASSCE**', '**2008 JUNE**', '**TECHNICAL DRAWING**' and '**1**', respectively.
   (c) In the box marked *Index Number,* write your **index number** vertically in the spaces on the left-hand side. There are numbered spaces in line with each digit. Shade carefully the space with the same number as each digit.
   (d) In the box marked *Paper Code,* write the digits **608112** in the spaces on the left-hand side. Shade the corresponding numbered spaces in the same way as for your index number.
   (e) In the box marked *Sex,* shade the space marked **M** if you are **male**, or **F** if you are **female**.
3. If you have got a pre-printed answer sheet, check that the details are correctly printed, as described in **2** above. In the boxes marked *Index Number, Paper Code* and *Sex,* **reshade** each of the shaded spaces.
4. An example is given below. This is for a **male** candidate whose **name** is **Chukwuma Adekunle CIROMA,** whose **index number** is **4251102068** and who is offering **Technical Drawing 1.**

THE WEST AFRICAN EXAMINATIONS COUNCIL

PRINT IN BLOCK LETTERS

Name: **CIROMA CHUKWUMA ADEKUNLE**   Examination: **WASSCE**   Year: **2008 JUNE**
       Surname   Other Names

Subject: **TECHNICAL DRAWING**   Paper: **1**

INDEX NUMBER	PAPER CODE	SEX
4 2 5 1 1 0 2 0 6 8	6 0 8 1 1 2	Indicate your sex by shading the space marked M (for Male) or F (for Female) in this box: M ▪ F ☐

INSTRUCTIONS TO CANDIDATES
1. Use grade **HB pencil** throughout.
2. Answer each question by choosing one letter and shading it like this: [A]   [B]   [C]   ▬
3. Erase completely any answers you wish to change.
4. Leave extra spaces blank if the answer spaces provided are more than you need.
5. Do not make any markings across the heavy black marks at the right-hand edge of your answer sheet.

For Supervisors only.
If candidate is absent shade this space: ☐

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Answer **forty** *questions in all: all the questions in Part* **1** *and* **ten** *questions only from either Part* **IIA** *or Part* **IIB**.

Each question is followed by **four** *options lettered A to D. Find out the correct option for each question and shade in* **pencil** *on your answer sheet, the answer space which bears the same letter as the option you have chosen. Give only* **one** *answer to each question. An example is given below.*

The part of a building immediately above a window frame is the

    A.   wall plate.
    B.   king post.
    C.   lintel.
    D.   wall

The correct answer is lintel *which is lettered C and therefore answer space C would be shaded.*

    [A]   [B]   [C]   [D]

Think carefully before you shade the answer spaces; erase completely **any** *answer(s) you wish to change.*

Do **all** *rough work on this question paper.*

PART 1

Answer **all** *the questions in this part.*

1. Which of the following shows a centre line?

2. Which of the following shows the curve of interpenetration of two **unequal** cylinders ?
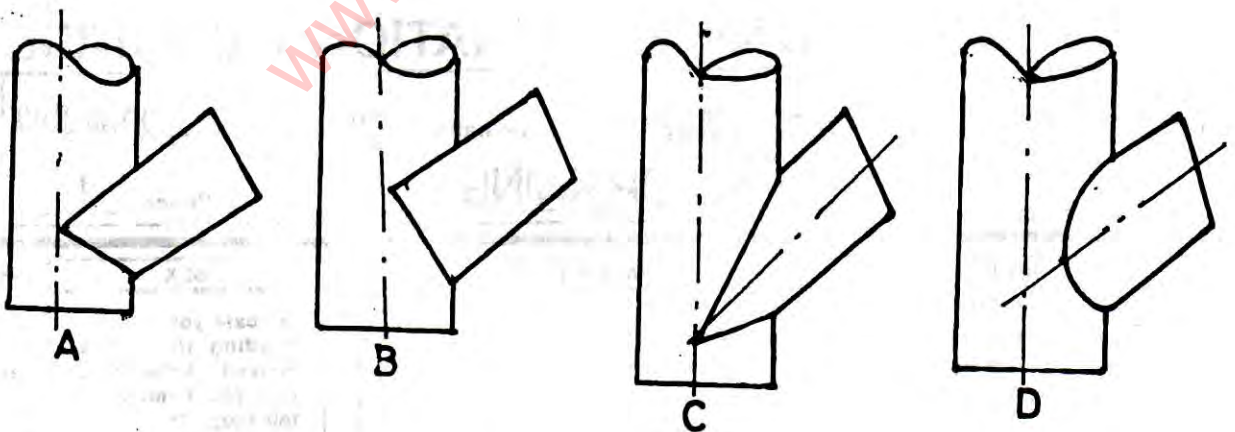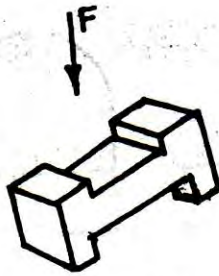

3. How many faces has a solid hexagonal pyramid?
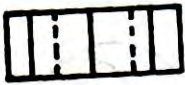
    A.   4
    B.   5
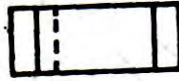   C.   6
    D.   7

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3

FE   EE

4. Which of the following is the **correct** pictorial drawing of the bracket shown above?

A   B   C   D

5. Which of the following is **not** a type of orthographic projection?
   A. First angle.
   B. Third angle.
   C. Isometric
   D. Auxiliary

6. The figure below shows isometric axes **OP, OQ** and **OR**. What is the value of angle 0?

   A. $15°$
   B. $25°$
   C. $30°$
   D. $45°$

7. The figure below shows the beginning of the construction of a/an

   A. cylinder.

   B. truncated cone.

   C. regular polygon.

   D. ellipse.

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Turn over

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8. The plan of the figure above in the direction of arrow **F** is

A   B   C   D

9. Which of the following is required to construct the polygon below?

A. Distance across flats

B. Distance across corners

C. Internal angle

D. Length of one side
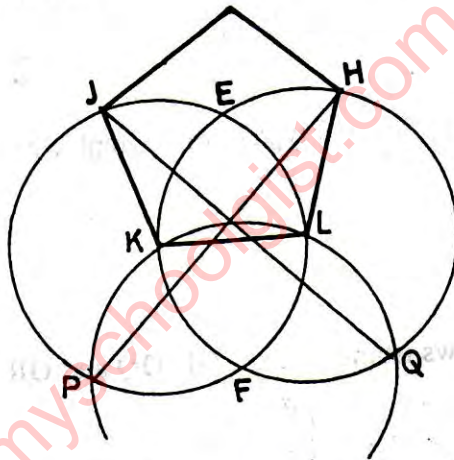
10. Which of the following drawing instruments is used to reproduce shapes?

A. Compass

B. Template

C. Divider

D. Protractor

11. Which of the following curves has eccentricity greater than one?

A. T

B. S

C. V

D. U
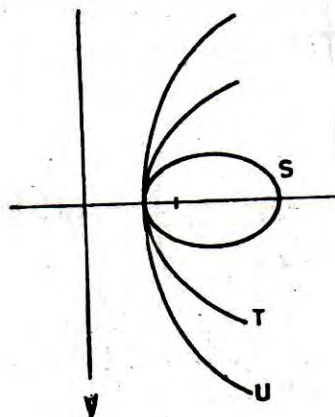
12. If the crank **OK** in the diagram below moves anticlockwise the link **KP** will

   A. rotate at **Q**

   B. slide towards **K**

   C. slide towards **P**

   D. remain stationary
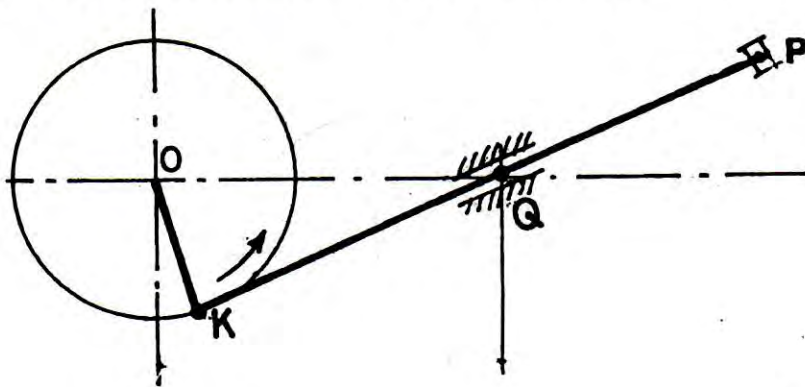
13. Which of the following is an example of a frustum?

   A. Water bucket

   B. Electric bulb

   C. Lantern

   D. Flourescent tube

14. The development of a closed square prism will have

   A. 4 rectangles and 4 squares.

   B. 2 squares and 2 rectangles.

   C. 4 rectangles and 2 squares.

   D. 4 squares and 2 rectangles.

15. If a length of 1 metre on land is represented by 2 *cm* on a drawing, what is the ratio of the scale used?

   A. 1:20

   B. 1:40

   C. 1:50

   D. 1:100

16. Which of the following has eight triangular faces?

   A. Octahedron

   B. Tetrahedron

   C. Hexahedron

   D. Decahedron

17. What type of section is suitable for showing the cross-section of a long bar?

   A. Removed

   B. Half

   C. Offset

   D. Revolved

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Turn over

18. Which of the following is the true shape of the section **S–S** above if the object is spherical?

A. Circle

B. Ellipse

C. Triangle

D. Sphere
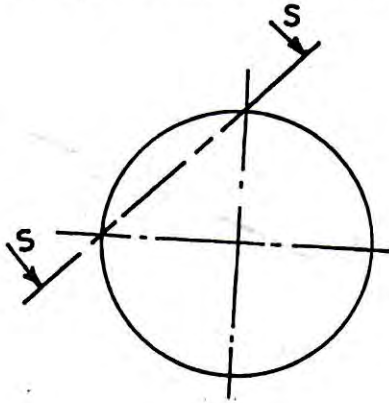
19. A conic section whose eccentricity is $\frac{4}{3}$ is a/an

A. hyperbola.
B. parabola.
C. sphere.
D. circle.

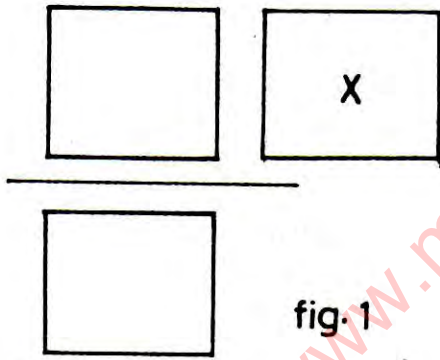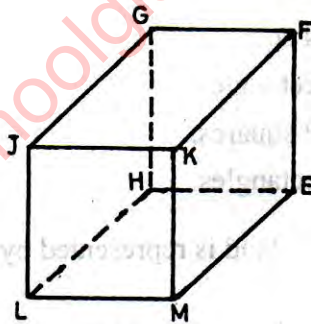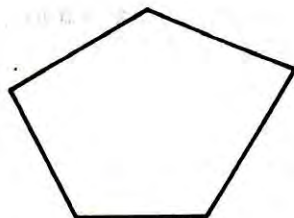fig. 1

fig. 2

20. If the rectangular tank in **figure 2** above is projected in first angle, the view **X** in **figure 1** represents surface
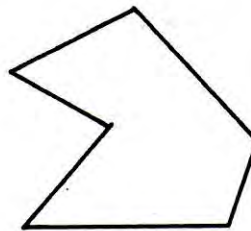
A. JKML
B. GHEF
C. GFKJ
D. EFKM

21. Which of the following polygons has one of its internal angles more than 180°?
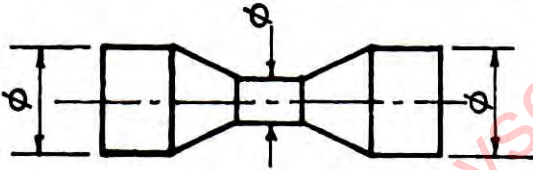

A   B   C   D

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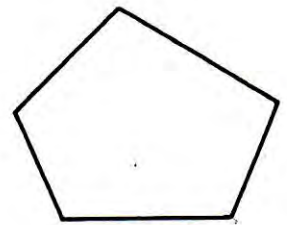
22. Which of the following is a circumscribed circle?
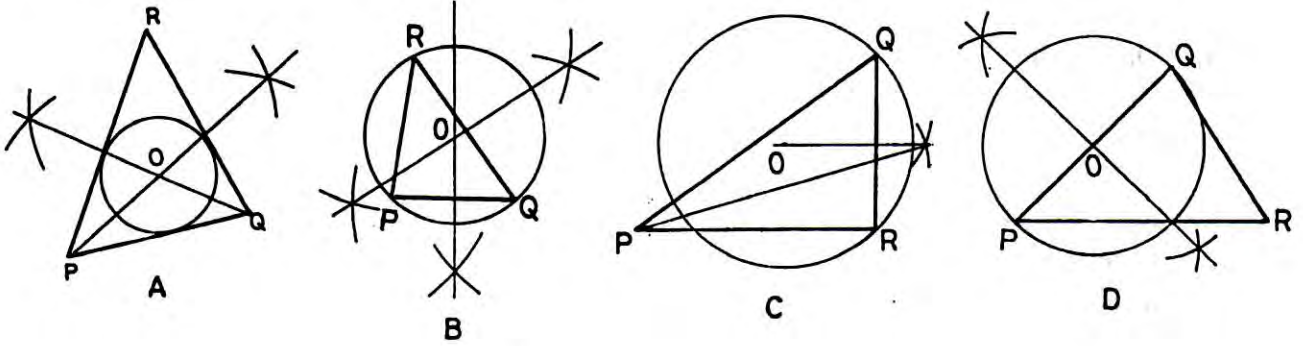
23. If a right cone is truncated by a cutting plane which is perpendicular to its axis, then the true shape of the cut surface is a/an

    A. ellipse.

    B. circle.
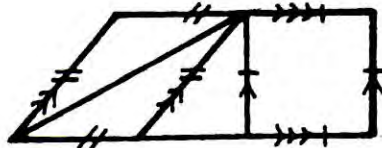
    C. semi-circle.

    D. parabola.

24. The figure below shows a trough. It comprises

    A. two truncated cones and three truncated cylinders.

    B. two truncated cones and three cylinders.

    C. two cones and three cylinders.

    D. three cones and three cylinders.

25. Which of the following planc figures is **not** represented in the figurc below?

    A. Trapezium

    B. Square.

    C. Rhombus

    D. Rectangle

26. The point where a line penetrates a plane is called the

    A. incident.

    B. trace.

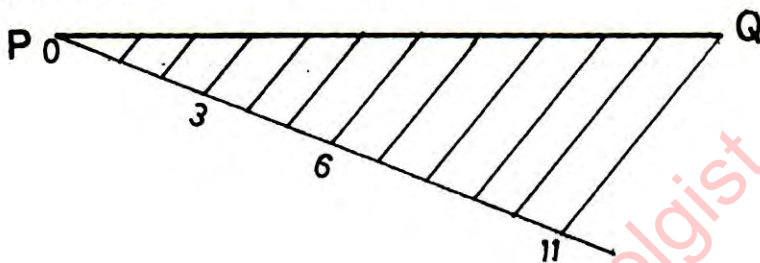   C. axis.

    D. directrix

Turn over

27. Which of the following is **not** a type of scale?

    A. Scale of chords
    B. Plain scale
    C. Diagonal scale
    D. Parallel scale
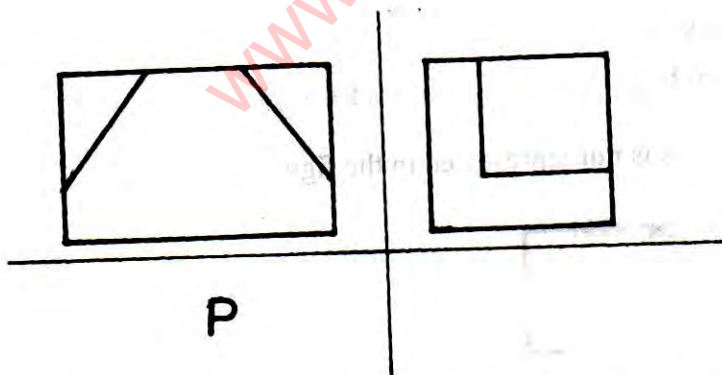
28. The head lamp of a car is constructed by applying the principle of

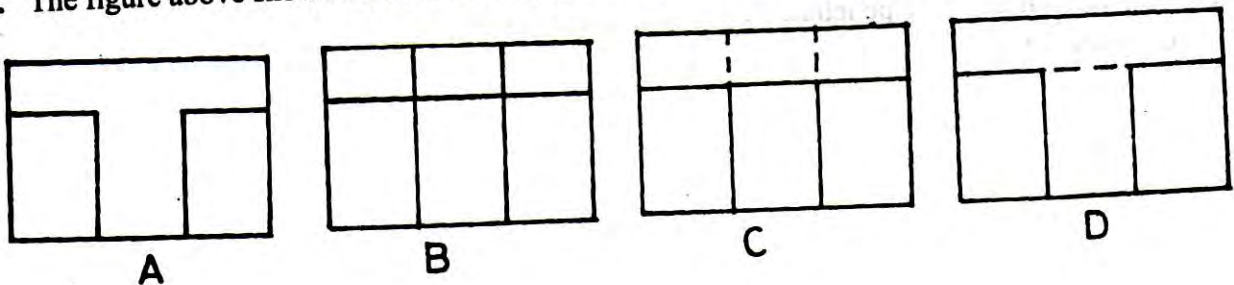   A. hyperbola.
    B. parabola.
    C. involute.
    D. cycloid.

29. The construction below cannot be used to

    A. determine the mid-point of line **PQ**.
    B. divide line **PQ** into eleven equal parts.
    C. construct a triangle whose sides are in ratio **3:5:3**
    D. construct a triangle whose perimeter is equal to line **PQ**.

30. The figure above shows a box in orthographic view. The correct view in the position **P** is
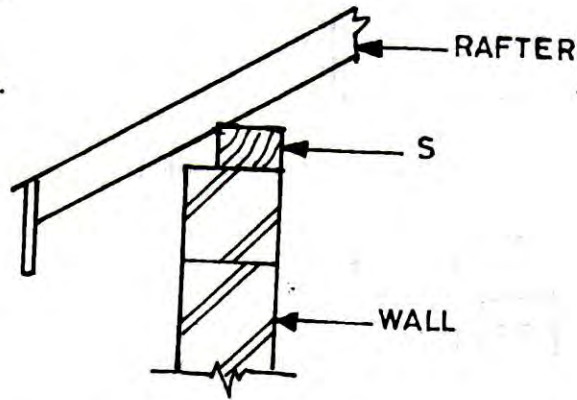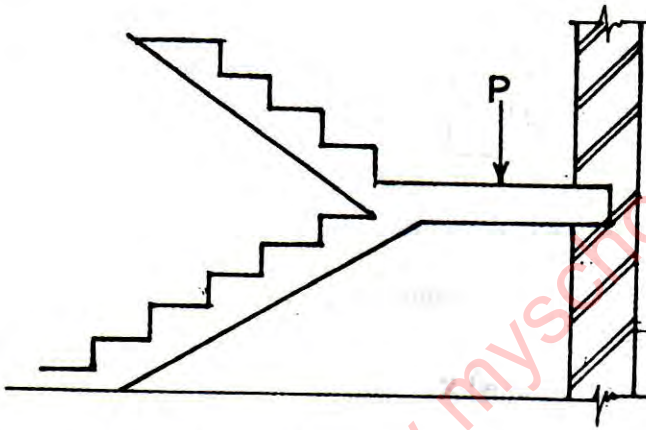
PART II A
BUILDING DRAWING (Optional)

31. The figure below shows part of a section through a roof and wall. The part labelled **S** is called

    A. purlin.
    B. reinforced concrete.
    C. wallplate.
    D. lintel.

Use the figure below to answer questions 32 and 33.

32. The part labelled **P** is the

    A. going.
    B. thread.
    C. landing.
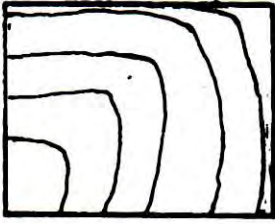   D. flight.

33. How many flights are in the stair case?

    A. Six
    B. Five
    C. Four
    D. Two
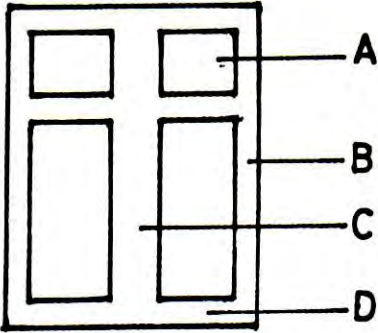
34. Which of the following is **not** a type of door?

    A. Raft
    B. Brazen
    C. Battern
    D. Ledged

Turn over

35. The material symbol shown below represents

A. wood

B. brick

C. concrete

D. glass

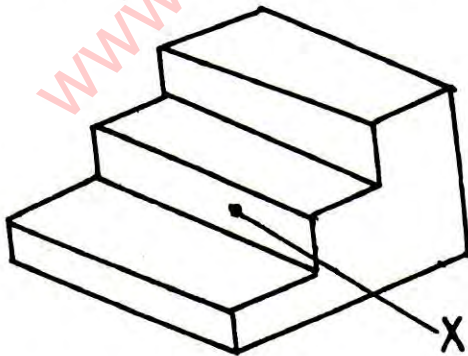**36.** In the double casement window shown below the stile is labelled

37. Which of the following is **not** a member of a roof?

A. Queen post

B. Jamb

C. Purlin

D. Wallplate

38. In the staircase shown below identify the part labelled **X**.
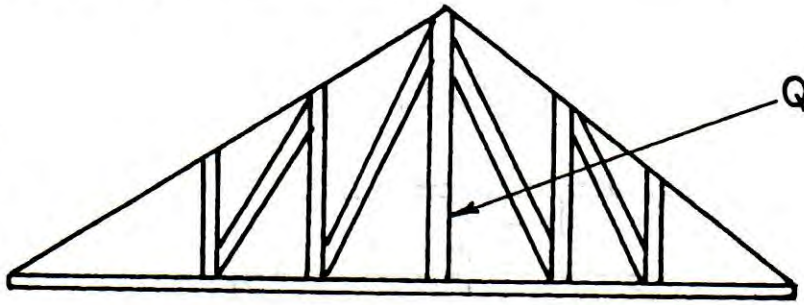
A. Riser

B. Flight.

C. Going

D. Landing

39. Soffit is a member of a

A. foundation.

B. roof.

C. floor.

D. wall.

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40. The part labelled **Q** in the figure below is called

   A. rafter.

   B. wallplate

   C. kingpost
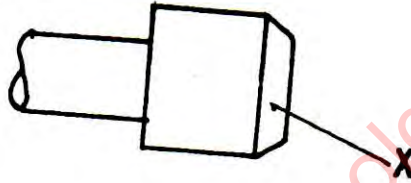
   D. purlin

PART II B
MECHANICAL DRAWING (Optional)

31. The portion marked **X** in the figure below is

   A. relessed.

   B. countersink.

   C. chanfered.

   D. spot faced.

Use the figure below to answer questions 32 and 33.

32. What type of thread form is shown above?

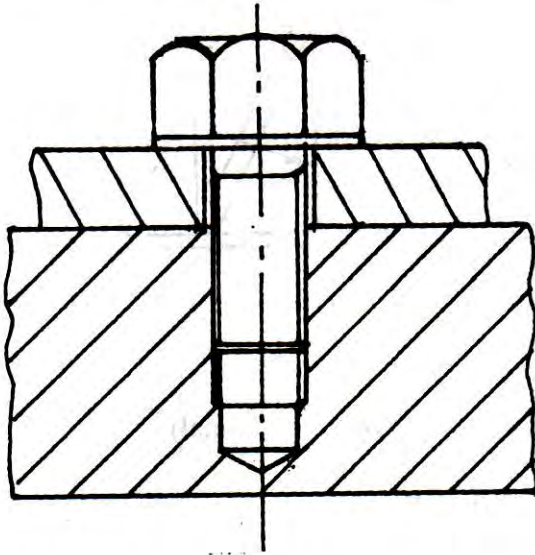   A. Acme

   B. Whitworth

   C. Buttress

   D. Square

33. **S** in the figure represents

   A. lead.

   B. pitch.

   C. root.
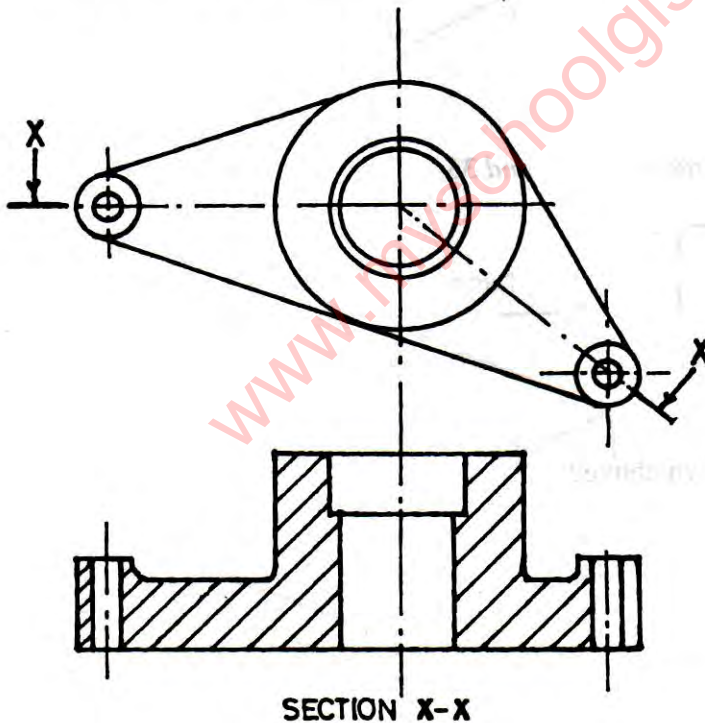
   D. depth.

Turn over

34. The two metals in the figure below are fastened together using

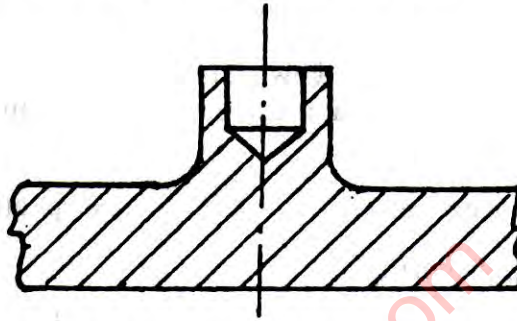   A. bolt.

    B. stud.

    C. screw.

    D. weld.

Use the figure below to answer questions 35 and 36.

SECTION **X–X**

35. What type of section is **X–X**?

    A. Aligned

    B. Revolved

    C. Removed

    D. Part

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36. How many different parts of the object are shown by section **X–X**?
    A. Five
    B. Four
    C. Three
    D. Two

37. Which of the following machine features are present in the figure below?

    A. Spot face and chamfer

    B. Blind hole and fillet

    C. Counter bored and fillet

    D. Countersunk and chamfer

38. The profile of a screw thread is constructed using the principle of a/an
    A. helix.
    B. parabola.
    C. hyperbola.
    D. involute.

39. Which of the following is **not** a type of key?
    A. Feather
    B. Dowel
    C. Gib
    D. Woodruff

40. Which of the following is a type of positive locking washer?
    A. Plain
    B. Spring
    C. Tab
    D. Star

DO NOT TURN OVER THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

YOU WILL BE PENALIZED SEVERELY IF YOU ARE FOUND LOOKING AT THE NEXT PAGE BEFORE YOU ARE TOLD TO DO SO.

SECTION B

[60 marks]

Answer any **three** *questions* **only** *from this section.*

1½ hours

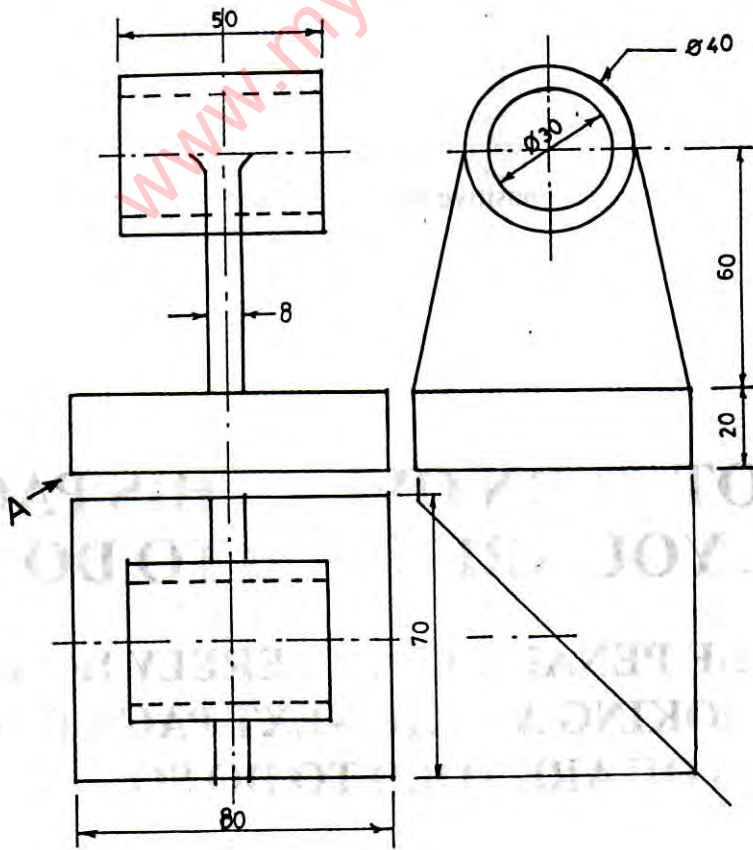## NOTE: QUESTION FIVE IS AVAILABLE TO CANDIDATES IN GHANA ONLY.

Strictly geometrical methods are to be used. Lines that are parallel, perpendicular or inclined at angles of 30°, 45° or 60° to other lines may be drawn without construction lines being shown. All other construction lines **must** be shown clearly. Accuracy and good draughtsmanship are essential.

One A2 (594 × 420 *mm*) sheet of drawing paper is provided. Both sides may be used. In the bottom right-hand corner of **each** side that is used, write your **name**, **index number** and the **number** of the questions you answered.

**All** dimensions on the diagrams are in millimetres except otherwise stated.

All questions carry equal marks.

1. A dustbin is made from a 3 *mm* thick sheet metal. It has a depth 70 *mm*, top and bottom external diameters are 80 *mm* and 60 *mm* respectively. Construct the dustbin in *isometric* view.

[20 marks]

2. The major and minor axes of an ellipse are 110 *mm* and 80 *mm* respectively. Construct:
    (a) the ellipse using focal points method;
    (b) a tangent and a normal to the ellipse at a point **P** above the major axis and 30 *mm* from the right hand end of the major axis.

[20 marks]

3. Three views of a cast bracket are shown below. Construct the bracket in *isometric* view.

[20 marks]

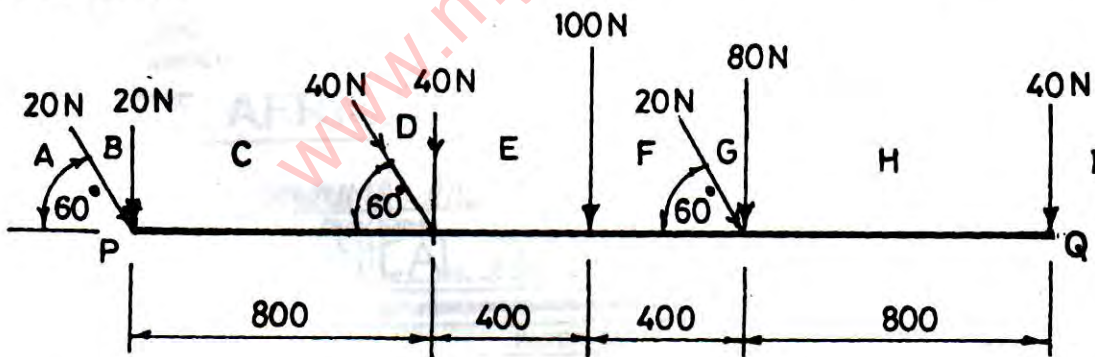4. A hexagonal based pyramid is cut by a plane **P–P** as shown below. Draw the
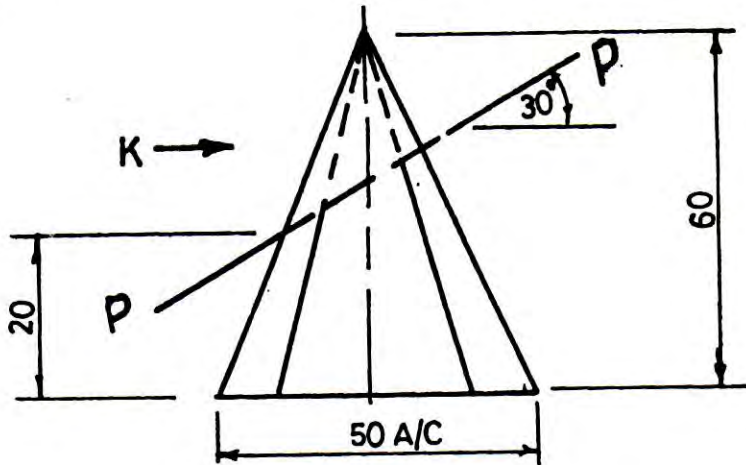
(a) given elevation;

(b) plan;

(c) end elevation in the direction of arrow **K**;

(d) true shape of the cut surface. [20 marks]

QUESTION 5 IS AVAILABLE TO CANDIDATES IN GHANA ONLY.

5. The figure below shows eight non-concurrent co-planer forces acting on a horizontal beam **PQ** of length 2.4 *m*.

(a) Draw to a scale of 1:20 (1 *mm* = 0.02 *m*) the space diagram;

(b) using a scale of 1 *mm* = 2 N and Bow's Notation indicated (A – I), determine graphically, the

(i) magnitude of the resultant of the eight forces;

(ii) point of action of the resultant force on the beam from **P**;

(iii) the inclination of the resultant to the horizontal. [20 marks]