**WORKFORCE DEVELOPMENT AUTHORITY**

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# ADVANCED LEVEL NATIONAL EXAMINATIONS, 2015, TECHNICAL AND PROFESSIONAL TRADES

**EXAM TITLE:**   Technical Drawing and D.C.G

**OPTION:**        Motor Vehicle Mechanics (MVM)

**DURATION:**     3hours

## INSTRUCTIONS:

The paper is composed of **three (3) Sections**:

Section **I**: Fifteen **(15)** questions, all **Compulsory**.                    **55marks**

Section **II**: Five (5) questions, **Choose Three (3) only.**          **30marks**

Section **III**: Three (3) questions, **Choose only One (1)**.          **15marks**

- Material: pencil / pen / rubber /lath / pair of compasses /square are allowed.

**Every candidate is required to strictly obey the above instructions. Punishment measures will be applied to anyone who ignores these instructions.**

**Section I. Fifteen (15) Compulsory questions.**        **55marks**

**01.** Define and give the necessity of "Tolerance" in technical drawing.        **2marks**

**02.** Draw a completed first angle projection for the object below:
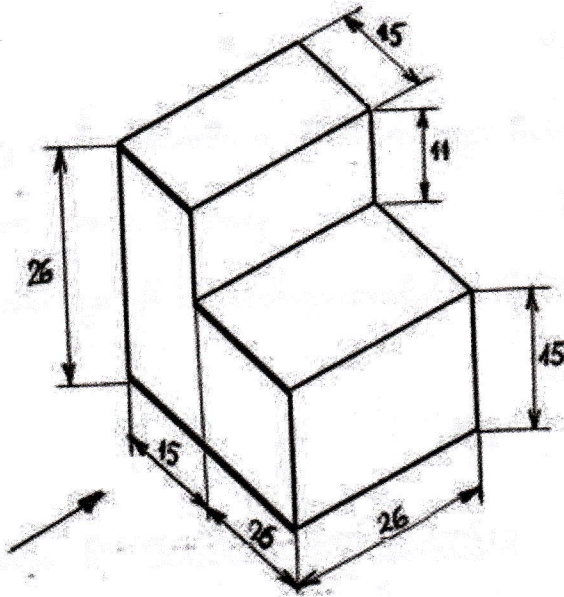


(The front view, Left hand side view and Top view or plan)

NB: not dimensioning/scale: 1:1        **3marks**

**03.** The side of a certain triangle is 41mm. Construct an equilateral triangle on the given side by using compass and ruler.        **3marks**

**04.** Explain the procedure for drawing a perpendicular to a line from a point not on line by using compass. Represent this by a drawing followed by the explanation.        **4marks**

**05.** Name and differentiate six types of triangle.        **6marks**

**06.** Draw an arc with a radius choice touching two given straight lines at right angles to each other and explain the steps of the construction procedure.        **6marks**

**07.** Mention the difference between section and full section.        **3marks**

**08.** Explain the meaning of the following abbreviations: MFG and STD.        **2marks**

**09.** Give two disadvantages of perspective projection.        **2marks**

**10.** Name three types of dimensioning and explain their use.        **6marks**

**11.** Name two dimensions of an object that are shown in an orthographic view and each one.        **4marks**

**12.** What is the meaning of Orthographic projection?        **1mark**

**13.** What is a scale and give its use.        **4marks**

**14.** Explain the procedure for drawing an arc or circle (radius) through three given points on your choice. Represent this by a drawing.                    **5marks**

**15.** Draw the following lines with 58 mm length.
    (i)    Cutting plane
    (ii)   Hidden detail
    (iii)  Break line
    (iv)  Center line                    **4marks**


**Section II. Answer any three (3) questions of your choice**
            **(Do not choose more than <u>three questions</u>).**        **30marks**


**16.** Construct a regular heptagon whose side is 20mm and describe the method of construction.                    **10marks**

**17.** Draw with accurate dimensions the front view, top view and right side view of the object shown pictorially in figure below in first angle projection system. The front elevation is indicated by the arrow. All dimensions are in mm. The scale is 1:1
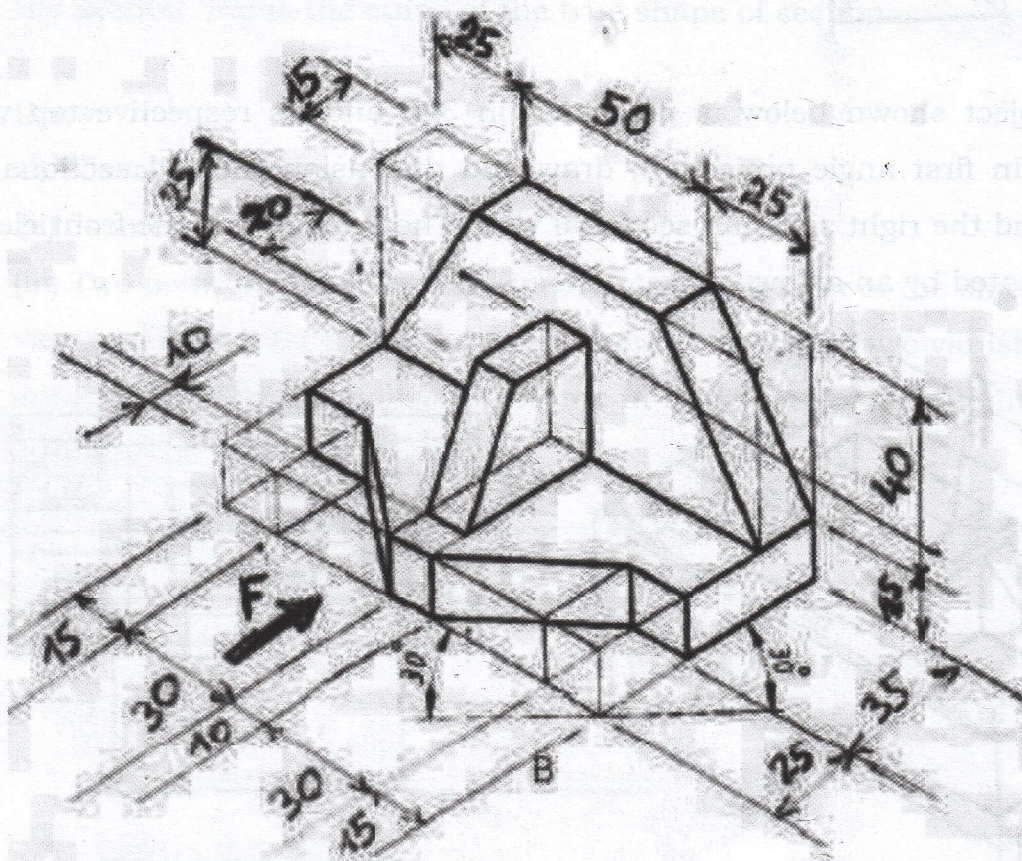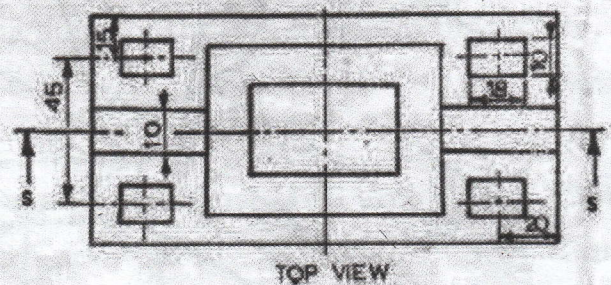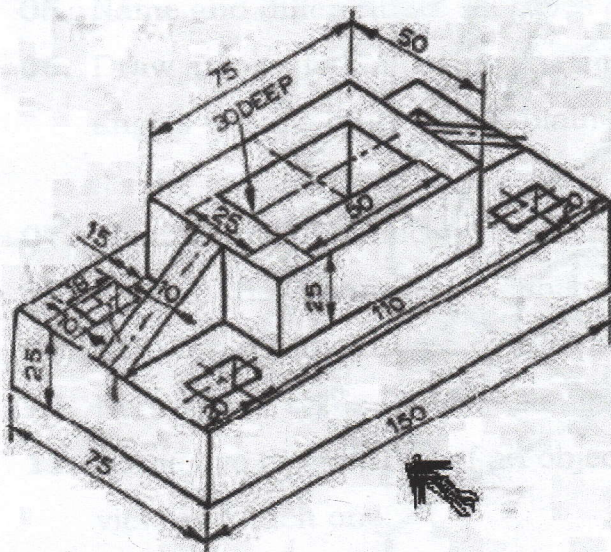


                                                                           **10marks**

**18.** A square pyramid of 30mm side of base and height 50mm rests with its base on HP (horizontal plane) with one of the edges of the base parallel to VP (vertical plane). It is cut by a section plane perpendicular to VP and inclined at $45^0$ to HP and bisecting the axis. Draw the development of the truncated pyramid.

**10marks**
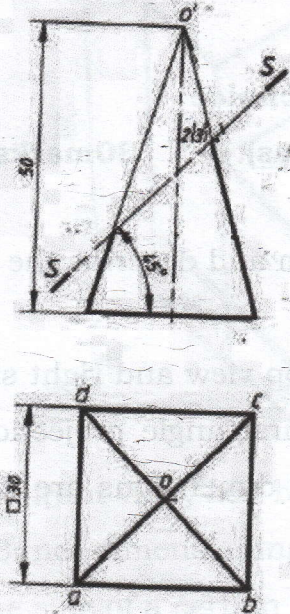


**19.** The object shown below is presented in 3-D and its respective top view is given. In first angle projection, draw and dimension the full sectional front view and the right side half sectional view. The scale is 1:1; the front elevation is indicated by an arrow.



TOP VIEW

**NB:** All dimensions are in mm.

**10marks**

**20. a)** Construct a regular Pentagon (5sides) within a circle of 80mm diameter.

**b)** Draw a line tangential to a circle of radius 20mm from a point located at 60mm from the centre of the circle.                                  **10marks**

**Section III. Answer any one (1) question of your choice**
**(Do not choose more than <u>one question</u>).**        **15marks**

**21.** Construct an ellipse whose distance of the focus from the directrix is 30mm and eccentricity is equal to 7/9. Describe the method of construction.

**15marks**

**22.** A cone, base 60mm diameter and axis 70mm stands vertically with its base on HP (horizontal plane). The vertical trace of a section perpendicular to VP (vertical plane) and parallel to one of the end generators of the cone passes at a distance of 15mm from it. Draw the sectional top view and the true shape of the section. Name the curve of the true shape of section.        **15marks**

**23.** Draw:

(i)  Cavalier oblique,

(ii) Isometric

(iii) Two point perspective pictorial drawing projection of the object whose top view and front view are respectively shown below. The two vanishing points are separated by a distance of 130mm in horizontal plane. All dimensions are in mm.  The scale is 1:1                                  **15marks**