Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. Which of the following representative fraction depicts an enlarging scale? **1**
(a) 1:2 (b) 1:3 (c) 1:0.2 (d) 1:1

ii. Which is the correct right-side view of the figure provided? **1**

(a) (b) (c) (d)

iii. A point is 8 units away from the vertical plane and 2 units away from profile plane and 4 units away from horizontal plane in 1st quadrant then the projections are drawn on paper the distance between the side view and front view of point is- **1**
(a) 10 units (b) 6 units (c) 12 units (d) 8 units

iv. The side view of a line perpendicular to HP is- **1**
(a) A line of shorter length.
(b) A line of true length.
(c) A line of true length inclined to profile plane.
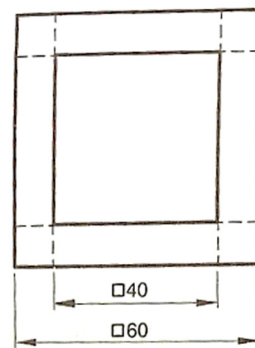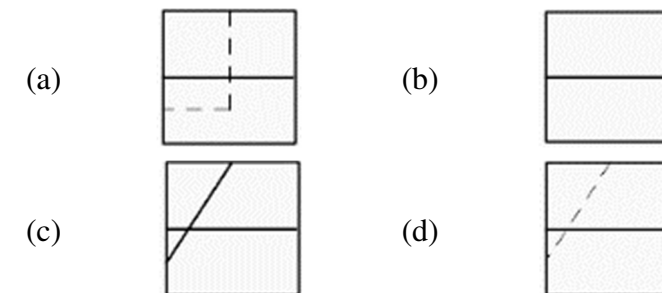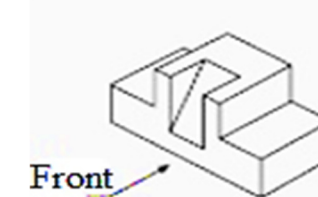(d) A point.

P.T.O.

OR iii. Draw the projection of a cube with 40 mm long edges resting on the H.P. on one of its corners with solid diagonal perpendicular to the V.P. **6**

Q.5 i. Draw the development of lateral surface of a square pyramid with 40 mm base side and a 60 mm long axis, resting on its base in the H.P. such that a side of the base is parallel to the V.P. **4**

ii. A pentagonal pyramid having a base with 30 mm sides and 70 mm long axis is resting on its base in the H.P. such that an edge of the base nearer to the V.P. is parallel to it. A vertical section plane inclined at 45^0 to the V.P. cut the pyramid at a distance of 8 mm from the axis. Draw its top view, sectional front view and the true shape of the section. **6**

OR iii. An object has its front, top and side views as shown in figure. Draw its isometric view. **6**

□40
□60

Q.6 Attempt any two:

i. What is CAD? Name two CAD software. Give two limitations of manual drawing and three advantages of computer aided drawing and drafting. **5**

ii. Name and explain five edit commands used in CAD. **5**

iii. Explain following commands in brief: **5**
(a) Move (b) Mirror (c) Copy (d) Trim (e) Array

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v. When a plane is perpendicular to a reference plane, its projection on **1** that plane is a-
(a) True line (b) Apparent line (c) Straight line (d) True shape

vi. Which of the following position is not possible in a solid? **1**
(a) Axis of solid parallel to HP perpendicular to VP.
(b) Axis of solid parallel to both HP and VP.
(c) Axis of solid perpendicular to both HP and VP.
(d) Base of solid on HP and axis perpendicular to VP.

vii. Which of the following is not the purpose of using cutting (section) **1** plane?
(a) Interpretation of object   (b) Visualizing of object
(c) Cutting the objects   (d) Invisible feature

viii. The following are the methods of development except: **1**
(a) Parallel line development   (b) Angular development
(c) Radial line development   (d) Triangulation

ix. Which AutoCAD command will determine precisely the volume of a **1** complex (or simple) 3D solid part?
(a) Area   (b) Volume   (c) Massprop   (d) Calculate

x. The axis used to show depth in the AutoCAD is the- **1**
(a) X axis   (b) Y axis   (c) Z axis   (d) W axis

Q.2 i. A rectangular field of 0.54 hectare is represented on a map by a **4** rectangle of 3 cm * 2 cm. Calculate the R.F. Draw a plain scale and show a distance of 560 metre on it.

ii. The pictorial view of a block is shown in figure below. Draw the front **6** view in direction of the arrow and top view in first angle method of projection
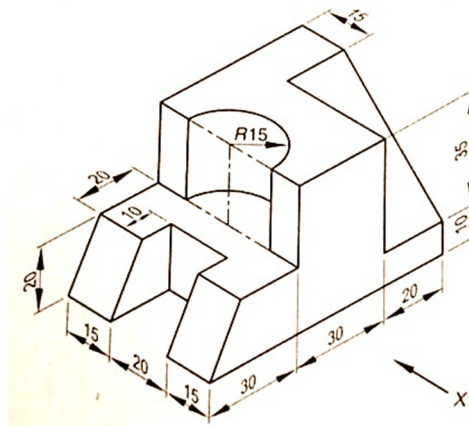
OR iii. Draw the following view of the drawing shown in figure in third angle **6** method of projection. (a) Front view in the direction of the arrow (b) Top view
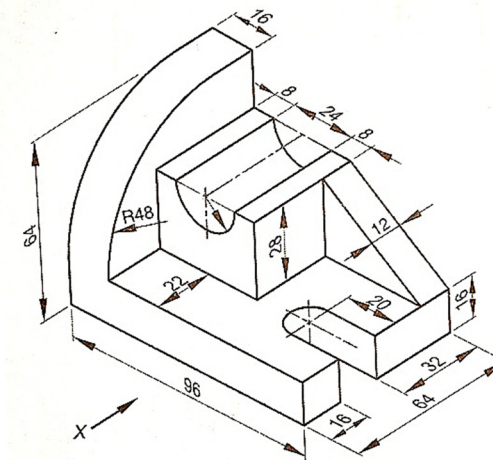
Q.3 i. Draw the projections of the following points on a common reference **4** line keeping the distance between their projectors 30 mm apart.
(a) Point A is in V.P. and 50 mm below H.P.
(b) Point B is 40 mm behind V.P. and 40 mm above H.P.
(c) Point C is 40 mm below H.P. and 20 mm in front of V.P.
(d) Point D is on H.P. and 20 mm behind V.P.

ii. A 100 mm long line PQ is inclined at 30^0 to H.P. and 45^0 to the V.P. **6** its mid-point is 35 mm above H.P. and 50 mm in front of V.P. draw its projections.

OR iii. A 75 mm long line AB lies in fourth quadrant and its front view **6** measures 55 mm. The line is parallel to H.P. and one of its ends is in the V.P. and 25 mm below H.P. Draw the projections of line and determine its inclination with the V.P.

Q.4 i. Determine the true shape of figure, the top view of which is a regular **4** pentagon of 35 mm side, having one side inclined at 30^0 to the V.P. & whose front view is a straight line making an angle of 45^0 to the H.P.

ii. A hexagonal pyramid of 25 mm base side and 55 mm long axis has **6** one of its slant edges on the ground. A plane containing that edge and the axis is perpendicular to H.P. and inclined at 45^0 to V.P. draw its projections, when the apex is nearer to V.P. then the base.

P.T.O.

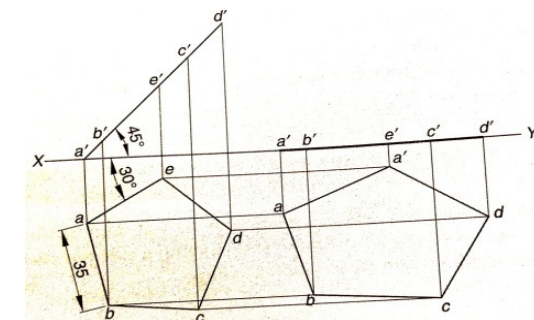## Marking Scheme
EN3ES19 / SC3ES05 Engineering Graphics

Q.1   i.   Which of the following representative fraction depicts an enlarging scale?   **1**
(c) 1:0.2

ii.   Which is the correct right-side view of the figure provided?   **1**

(d)

iii.   A point is 8 units away from the vertical plane and 2 units away from profile   **1** plane and 4 units away from horizontal plane in 1st quadrant then the projections are drawn on paper the distance between the side view and front view of point is-
(a) 10 units

iv.   The side view of a line perpendicular to HP is-   **1**
(b) A line of true length.

v.   When a plane is perpendicular to a reference plane, its projection on that   **1** plane is a-
(c) Straight line

vi.   Which of the following position is not possible in a solid?   **1**
(c) Axis of solid perpendicular to both HP and VP.

vii.   Which of the following is not the purpose of using cutting (section) plane?   **1**
(c) Cutting the objects

viii.   The following are the methods of development except: **1**
(b) Angular development

ix.   Which AutoCAD command will determine precisely the volume of a   **1** complex (or simple) 3D solid part?
(c) Massprop

x.   The axis used to show depth in the AutoCAD is the-   **1**
(c) Z axis

Q.2   i.   Calculation of R.F.   1 mark   **4**
Drawing of scale   2 marks
For showing distance   1 mark

ii.   Draw the front view in direction of the arrow and top view in first angle   **6** method of projection.
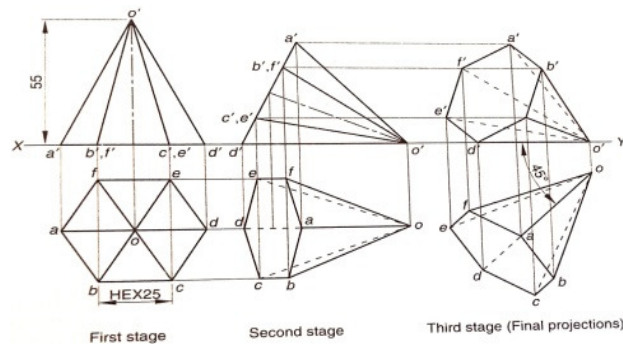Dimensioning   1 mark
Front view   2 marks
Top view   2 marks

Construction work   1 mark

OR   iii.   Draw the following view of the drawing shown in figure in third angle   **6** method of projection. (a) Front view in the direction of the arrow   (b) Top view
Dimensioning   1 mark
Front view   2 marks
Top view   2 marks
Construction work   1 mark

Q.3   i.   Draw the projections of the following points on a common reference line   **4** keeping the distance between their projectors 30 mm apart.
(a) Point A is in V.P. and 50 mm below H.P.   1 mark
(b) Point B is 40 mm behind V.P. and 40 mm above H.P.   1 mark
(c) Point C is 40 mm below H.P. and 20 mm in front of V.P.
   1 mark
(d) Point D is on H.P. and 20 mm behind V.P.   1 mark

ii.   Draw its projections   **6**
Locating position of mid-point   1 mark
Front view   2 marks
Top view   2 marks
Dimensioning   1 mark

OR   iii.   Draw the projections of line and determine its inclination with the V.P.   **6**
Front view   2.5 marks
Top view   2.5 marks
Dimensioning   1 mark

Q.4   i.   Determine the true shape of figure,   **4**
First stage   1.5 marks
Second stage   2 marks
Dimensioning   0.5 mark

ii.   First stage   1.5 marks   **6**
Second stage   2 marks
Third stage   2 marks
Dimensioning   0.5 mark

First stage   Second stage   Third stage (Final projections)

OR iii. Draw the projection of a cube   **6**

First stage	1.5 marks
Second stage	2 marks
Dimensioning	0.5 mark

First stage   Second stage   Third stage (Final projections)

Q.5 i. Draw the development of lateral surface of a square pyramid   **4**

First stage	1.5 marks
Second stage	2 marks
Third stage	2 marks
Dimensioning	0.5 mark

ii. Draw its top view, sectional front view and the true shape of the section.   **6**

First stage	1.5 marks
Second stage	2 marks
Third stage	2 marks
Dimensioning	0.5 mark
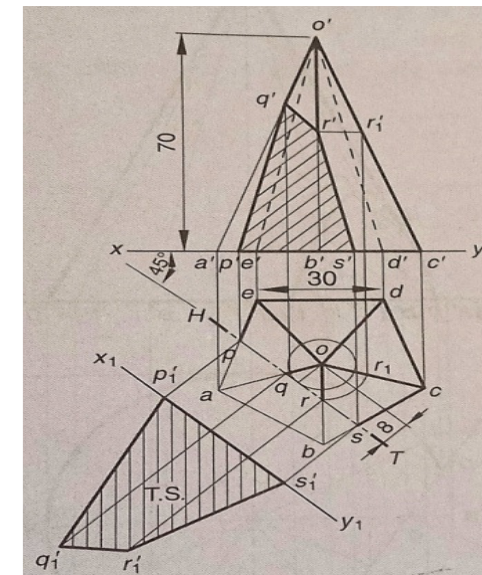
OR iii. Draw its isometric view.   **6**

Front view and top view	2 marks
Development	2 marks
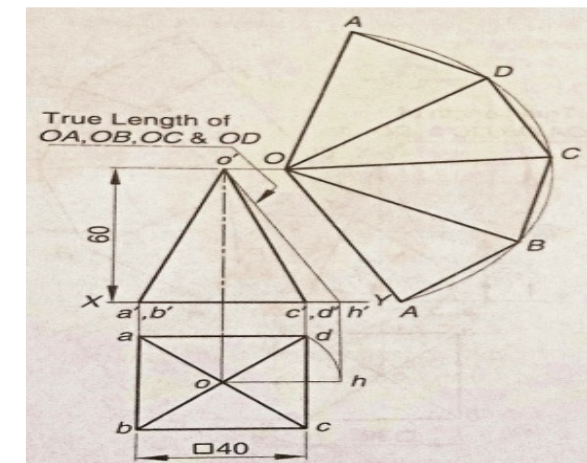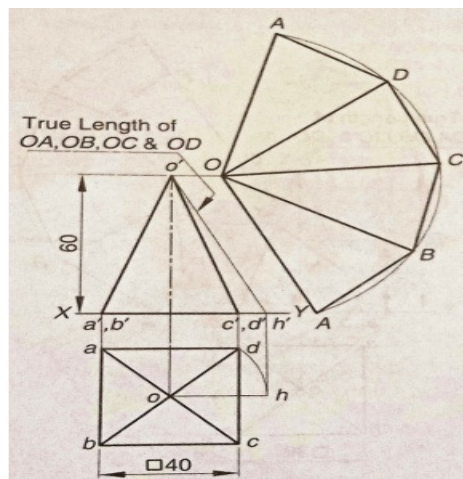
Q.6   Attempt any two:

i. CAD   1.5 marks   **5**

Two CAD software   1 mark

Two limitations of manual drawing

0.5 mark for each (0.5 mark * 2)   1 mark

Three advantages of computer aided drawing and drafting

0.5 mark for each (0.5 mark * 3)   1.5 marks
ii.   Name and explain five edit commands used in CAD.   **5**
      1 mark for each command   (1 mark * 5)
iii. Explain following commands in brief: **5**
      (a) Move   (b) Mirror   (c) Copy   (d) Trim   (e) Array
      1 mark for each command   (1 mark * 5)

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