Roll No. [ ][ ][ ][ ][2][3][9][8][5][8] Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Agriculture Engineering)/ (AI&ML)/ (AI and Data Science)/ (Automation & Robotics)/(AI)/(Automobile Engineering)/ (CE)/ (CSE)/(Cyber Security/(Data Science)/(Electrical & Electronics Engineering)/ (EE)/ (ECE) (Electronics & EE)/ (Food Technology)/ (IT)/ (ME)/ (Robotics & Artificial Intelligence)/ CSE (Internet of Things and Cyber Security Including Block Chain Technology) (Sem–1,2)

ENGINEERING GRAPHICS & DESIGN

Subject Code : BTME101-21

M.Code : 91335

Date of Examination : 24-06-2023

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION - B & C, have FOUR questions each.**
3. **Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.**
4. **Select atleast TWO questions from SECTION - B & C.**

SECTION-A

1. **Write briefly :**

a) Explain the following terms with a suitable drawing: Apex, Slant Height, Base Rim and Generator.

b) Differentiate between Isometric Projections and Isometric View.

c) Explain with the help of an example the Aligned system of placement of dimensions.

d) What do you mean by Representative Fraction (RF)?

e) Explain the types of dimensions with a suitable drawing.

f) Draw projections of a line inclined to VP and parallel to HP with a suitable freehand drawing. Assume suitable dimensions. Also, show traces.

g) How will you represent Liquid and Concrete on a drawing sheet?

h) Show by means of traces, a plane perpendicular to VP and inclined to HP.

i) Write the following statement using single stroke capital vertical letters of 12 mm size:

"THE FUTURE BELONGS TO THOSE WHO BELIEVE IN THE BEAUTY OF THEIR DREAMS"

j) Draw a regular Pentagonal Lamina of side 55mm.

SECTION-B

2. A map is to be drawn with RF 1:50. Construct a scale to read meters, decimeters and centimeters and long enough to measure up to 6 m. Show on it a distance of 4.78 m.

3. A point "P" is 48mm in front of VP and 58 mm above HP. Draw its projections and find out its shortest distance from the reference line.

4. A line "AB" 70mm long is inclined at 45° to HP and 30° to VP. Its midpoint "P" is 30mm below the HP and 25mm behind the VP. Draw the projections of the line.

5. End "A" of line AB is 18mm above HP and 40mm in front of VP and end "B" 15mm behind the VP and 25mm below the HP. The end projectors are 45mm apart. Draw the projections and find TL, θ, ϕ, HT and VT.

SECTION-C

6. A regular hexagonal lamina of side 48mm having a central circular hole of diameter 48mm is resting on one of its corners on HP such that one of its base edges is perpendicular to HP. Draw its projections when the said lamina is parallel to VP.

7. A right regular Pentagonal pyramid of base edge 48mm, axis 65mm is resting on HP on one of its base edges such that axis is parallel to both HP & VP.

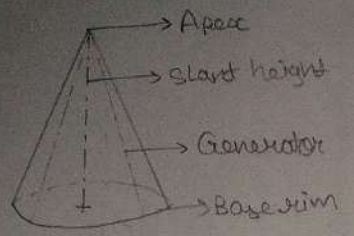
8. A right regular square pyramid of base edge 54mm and axis 68 mm long; rests on its base on HP with its base edges equally inclined to VP. Draw its projections assuming the pyramid in 1st quadrant.

9. A cone of diameter 40mm and axis 60mm is placed centrally on the top of a square block of 40mm edge and 15mm thick. Draw the isometric drawing of the two solids.

NOTE : Disclosure of Identity by writing Mobile No. or Marking of passing request on any paper of Answer Sheet will lead to UMC against the Student.

SECTION - A

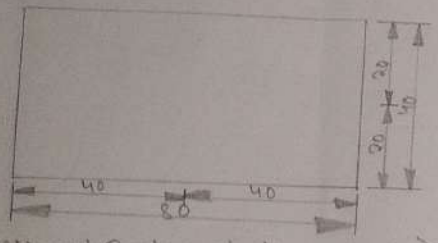
Ans:-a



Ans:-b Isometric View :- It is drawn to actual scale. When lines are drawn parallel to isometric axes, the true lengths are laid off.

Isometric Projection :- It is drawn to isometric scale. The isometric length is 0.8165 times the actual length

Ans:-c



(Aligned System of dimensioning)

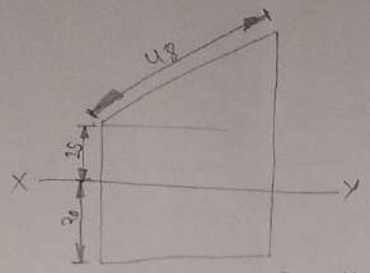
Ans:-d Representative fraction is the ratio of length of the object in the drawing to the actual length of the object.

$$R.F = \frac{\text{Length of the object in the drawing}}{\text{Actual length of that object}}$$

Ans:-e Size Dimension: Dimensions which indicate the various sizes of the object such as length, breadth, diameter etc. & is denoted by 'S'

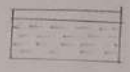
Location Dimension: Dimensions which locate the position of one feature w.r.t the other features & is denoted by 'L'.

Ans:-f



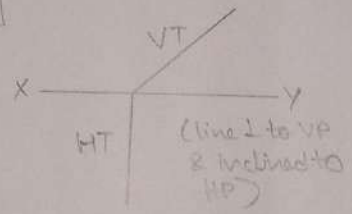
(Line inclined to VP & Parallel to HP, freehand drawing)

Ans:-g Liquid:



Concrete:

Ans:-h



Ans:-i h = 72mm General ratio = 7:5 $\Rightarrow \frac{7}{5} = \frac{72}{x} \Rightarrow x = \frac{60}{7} = 8.57 = 9$

New ratio = 12:9

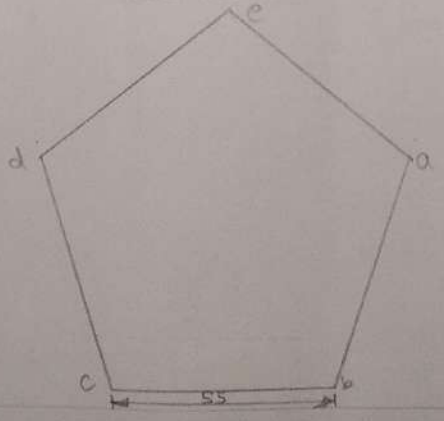
I $\Rightarrow \frac{7}{1} = \frac{72}{x} \Rightarrow x = \frac{72}{7} = 1.7 \simeq 2 \Rightarrow 12:2$

L $\Rightarrow \frac{7}{4} = \frac{72}{x} \Rightarrow x = \frac{48}{7} = 6.85 \simeq 7 \Rightarrow 12:7$

M $\Rightarrow \frac{7}{6} = \frac{72}{x} \Rightarrow x = \frac{72}{7} = 10.28 \simeq 10 \Rightarrow 12:10$

W $\Rightarrow \frac{7}{8} = \frac{72}{x} \Rightarrow x = \frac{96}{7} = 13.71 \simeq 14 \Rightarrow 12:14$

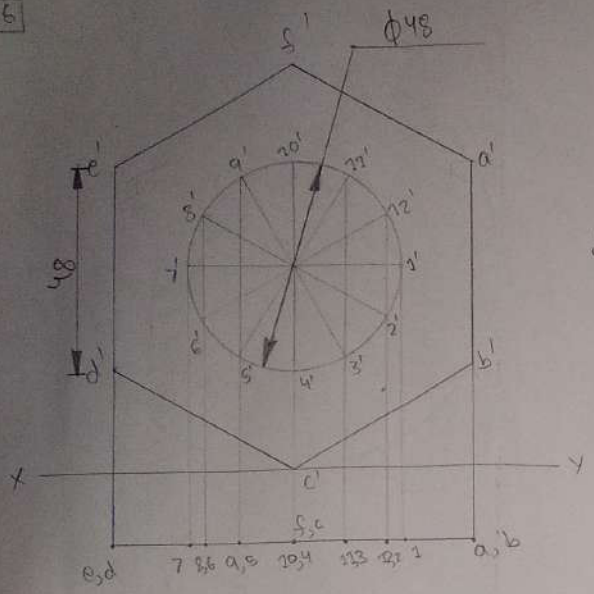
Ans:-j Pentagonal lamina of side 55mm



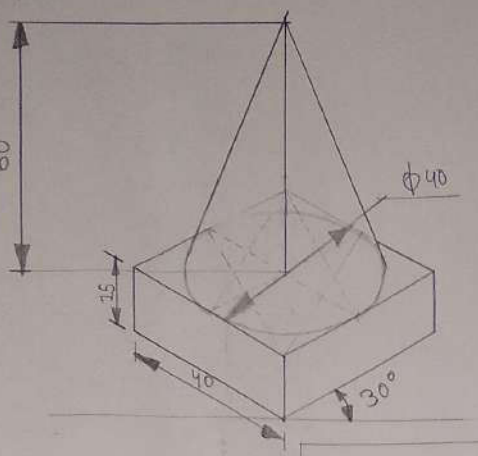
THE FUTURE BELONGS TO THOSE WHO BELIEVE IN THE BEAUTY OF THEIR DREAMS

SECTION - C

Ans:-6



Ans:-9



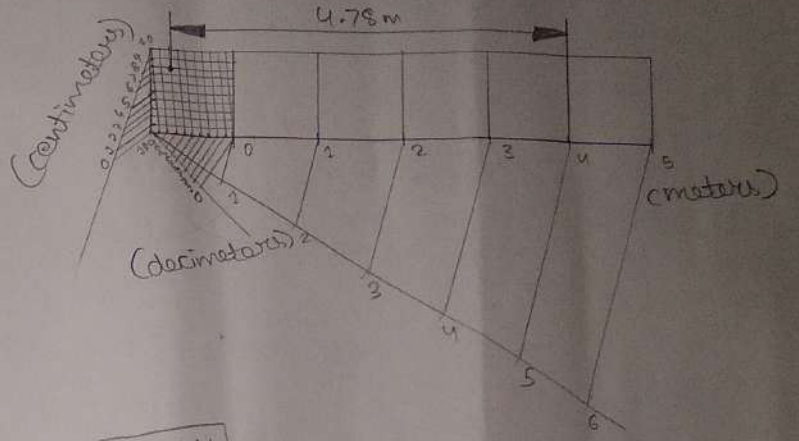
SECTION - B

Ans:-2 Given R.F = 1:50

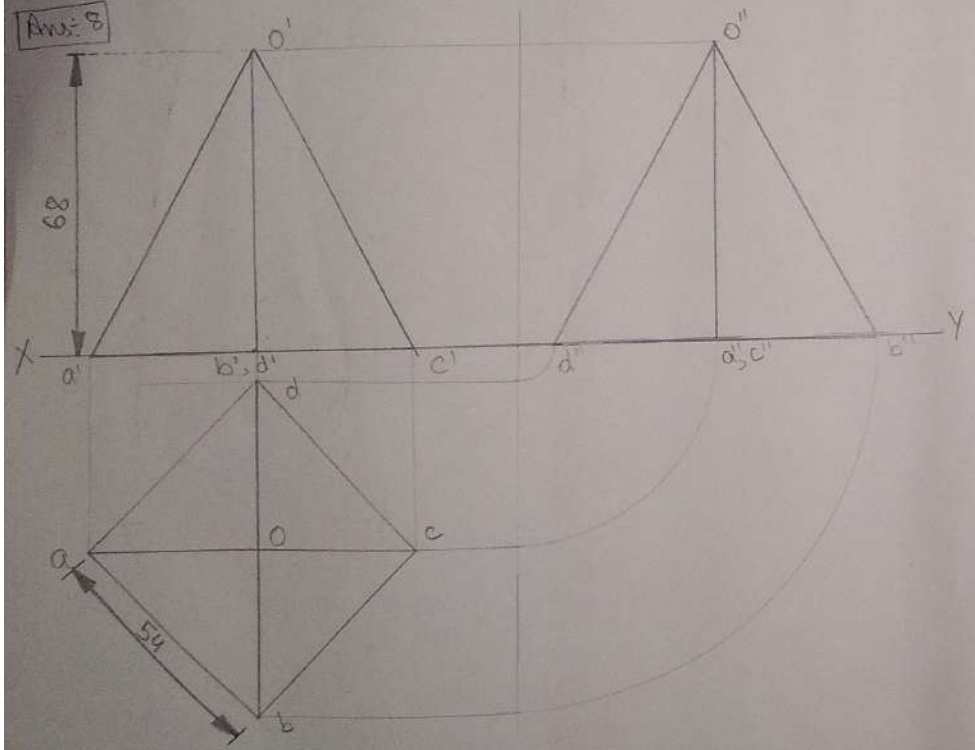
length (max) = 6m

$\therefore$ LOS = R.F × length (maximum)

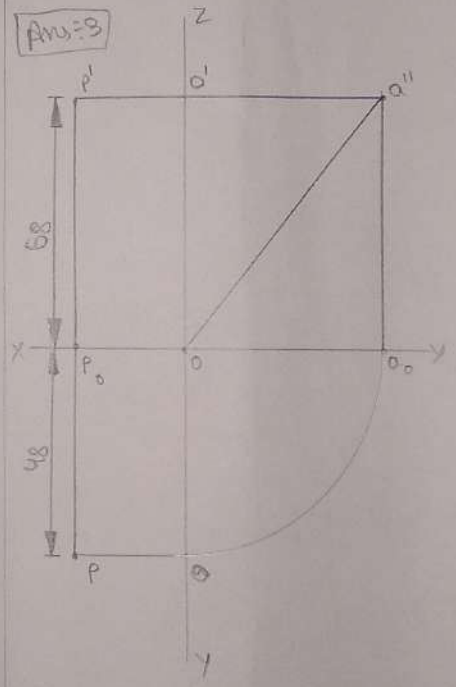
$= \frac{1}{50} \times 6 \times 100 = 12cm$



Ans:-8



Ans:-3



Shortest distance

$Oa'' = 75mm$

Ans:-4