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Total No. of Questions : 09

Total No. of Pages : 02

B.Tech.(AI&ML/CE/CSE/CS&D/EE/ECE/DS/EEE/IT/ME/Robotics &
Artificial Intelligence/Internet of Things and Cyber Security including
Block Chain Technology)) (Sem.–1)

ENGINEERING GRAPHICS & DESIGN

Subject Code : BTME101-21

M.Code : 93799

Date of Examination: 23-12-2023

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 short notes on :

   a) Explain any two types Lines used in Engineering Drawing.

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

   c) Draw projections of a line lying on a Profile Plane whose top view is larger than its front view. Which angle is bigger " θ" or "Ø" ? Show with the help of a suitable free hand drawing.

   d) Show conventional representation of Glass and Wood on a Drawing Sheet.

   e) Explain the importance of a title block.

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

   g) Explain the difference between an isometric projection and isometric drawing.

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

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

   j) Draw projections of a line inclined to VP and parallel to HP with a suitable freehand drawing. Also, show traces.
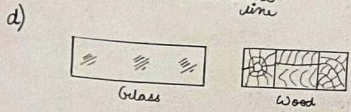
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SECTION-B

2. Line "KP" 68 mm long; has its end "K" on HP and 22 mm from VP. It is inclined at 42° to the W and 35° to the "HP". Draw its projections when the line is lying in first quadrant.

3. Draw a scale of R.F 1/50 to read meters and decimeters and long enough to measure up to 6m. Show 5.7m on the scale.

4. A point "M" is 36mm behind VP and 42mm below HP. Draw its projections and find out its shortest distance from the reference line.

5. End "A" of a line AB is 49 mm in front of VP and 11 mm above HP and end WB" is 7 mm in front of VP and 59 mm above HP. The distance between end projectors is 52mm. Draw its projection and find TL, θ, Ø, HT and VT.
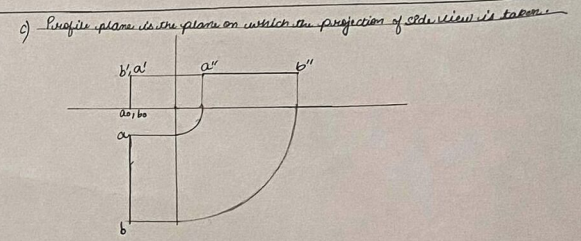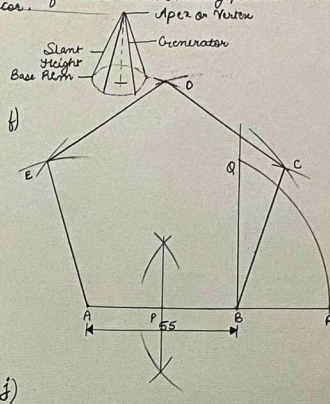
SECTION-C

6. A regular hexagonal lamina of side 20 mm, perpendicular to HP and lying on HP on one of its sides. The plane is parallel to VP and 20 mm from VP. Draw its projections and show traces.

7. A cone of base diameter 45 mm and axis 58 mm long; is lying on HP on a point of its circumference such that its generator is perpendicular to HP. Draw its projections assuming the object lying in first quadrant.

8. Draw isometric drawing of a hexagonal prism of base edge 25mm and axis 62mm long.

9. A right regular pentagonal pyramid of base edge 32mm and axis 63mm long rests on its base on the HP such that one of its base edges is perpendicular to VP. Draw its projections.

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.

1 a) Continuous Thick :- This line is used for visible outline and edges.
Continuous Thin :- These lines are used as dimension lines, extension lines, construction lines, leader lines and section lines.
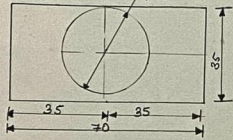
Continuous Thick line   Continuous Thin line
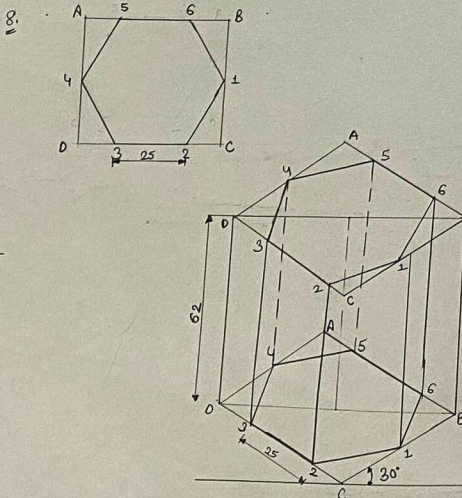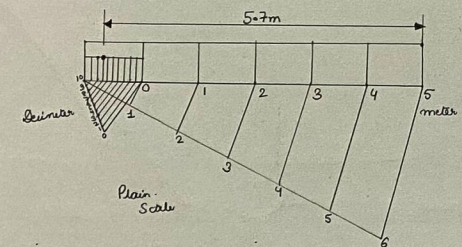
d)

Glass   Wood

h)
VT

$\phi = 45°$

HT

e) Title Block is an important part of the drawing as it provides all the information of the drawing such as scale of the drawing, method of projection used, name of the person who has drawn it.

Name	Name of	institution
Roll no.		
Branch	Title of	⊲◯
Date	drawing	
Scale		

50   50   50
150

i) Aligned System :- In an aligned system, all the dimensions are placed above the dimension line such that they may be read either from the bottom or from the right hand side of the drawing

$\phi 30$

35   35
70

b) Apex :- It is the topmost point in a solid where all the triangular faces meet.
Slant Height :- It is distance measured along a lateral face from base to apex.
Base Rim :- It is the circular base of solids such as cylinders or cone.
Generator :- A line drawn from the vertex to any point on the base of cone is known as generator.

Apex or Vertex
Generator
Slant Height
Base Rim
O

E   Q   C

A   P   55   B   R

f)

c) Profile plane is the plane on which the projection of side view is taken.

b', a'   a''   b''
a_0, b_0
a
b

g) Isometric projection :- In this projection, we convert 3-D objects in 2-D. Here actual size is not taken in consideration instead we multiply the actual length of object with 0.8165.
Isometric Drawing :- In this, we draw 3-D objects in 2-D. Here, the actual length of the object is taken in consideration.

30°   30°
Isometric Drawing   30°   30°
Isometric Projection

Isometric drawing is 22.5% larger than isometric projection.

j)
VT   a'   b'
X   Y
a ϕ b
b

2
R 68
p'   b'
X $\theta = 35°$ Y
22
K' K
k
$\phi = 42°$
P b_2

3 $RF = \frac{1}{50}$

$LOS = R.F \times Maximum\ Distance$
$= \frac{1}{50} \times 6 \times 100 = 12\ cm$

5.7m

Decimeter   0   1   2   3   4   5 meter

Plain Scale

4.
y
o'
m
X O_2 O m_b Y
X O_3
m'' O_3 m'
Z
$om'' = Shortest\ Distance$
$om'' = 5.5\ cm\ or\ 55mm$

5
b' b_1'
TL
a   10
VT
X a_0 b_0 Y
b b_2
HT   a ϕ
b_1

$\theta = 35°$
$\phi = 30°$
$T.L = 80mm$

6.
e'   d'
f'   c'
a   20   b'
X   Y
f   e,a   d,b   c

7.
58
o'   o
$\phi 45$

8.
A   5   6   B
4   1
D   3   25   2   C

A   5
4   6
D   3
62   2   C
1
B
D   6
3   25   1
2   30°   C

9.
O'
63
X   b', a'   c', c'   d'   Y
a   e
32
b   o   d
c