Name: Roll No.: Group:

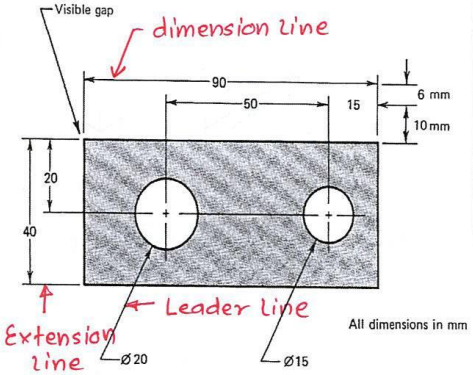
Indian Institute of Technology Guwahati

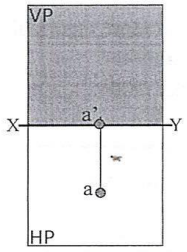
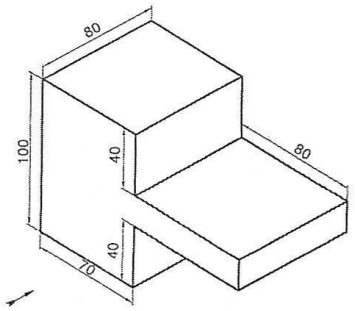
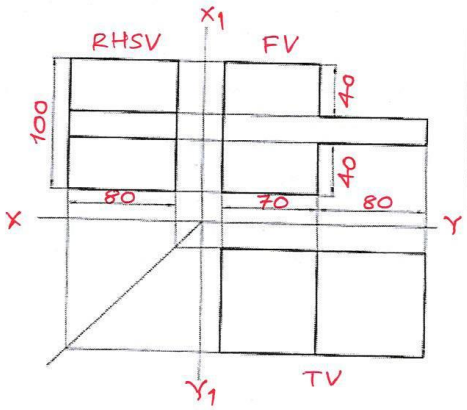
ME111: Engineering Drawing

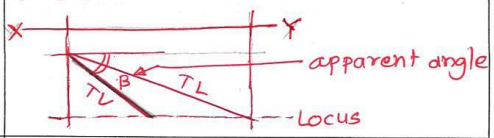
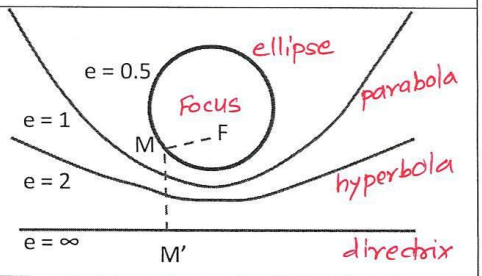
Mid Semester Examination
September 15, 2012 (Saturday)

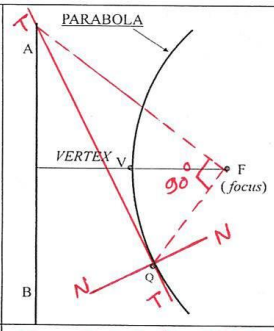
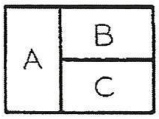
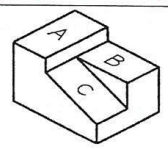
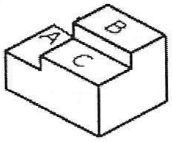
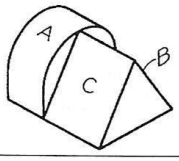
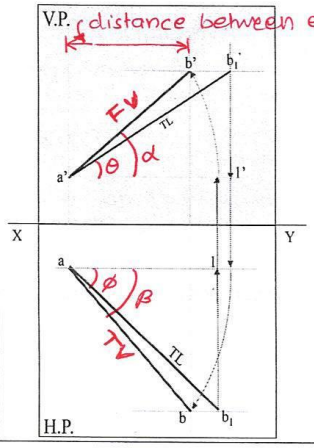
B Tech First Year (Jul – Nov 2012)
Division - I
Marks: 100
Time: 1 hour (10 – 11 am)

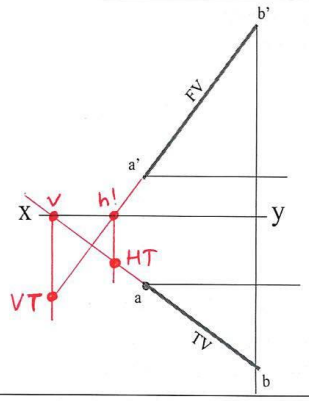
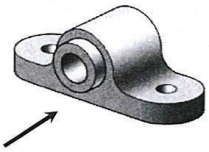
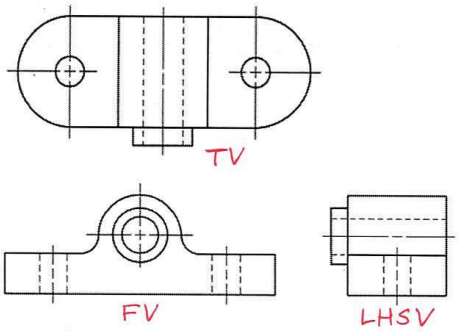
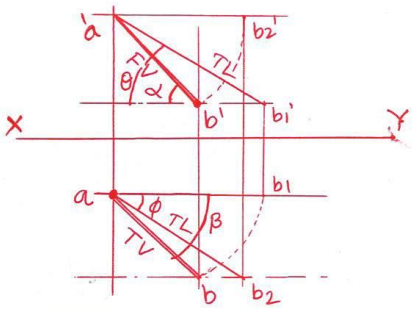
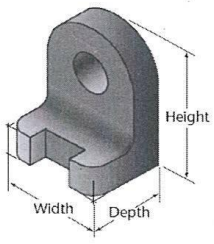
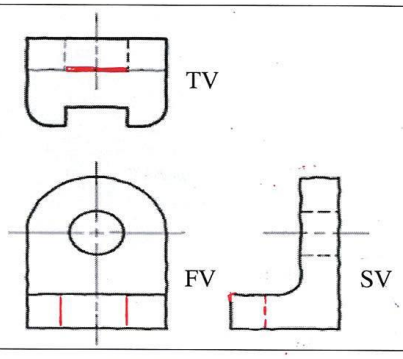
Instructions: Answer point-wise and briefly only in the space provided. No clarification from invigilators. Use of unfair means fetches F-Grade.

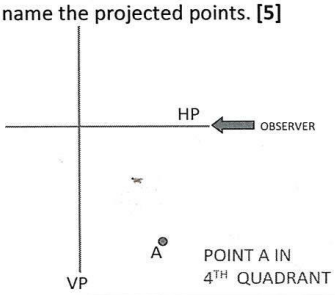
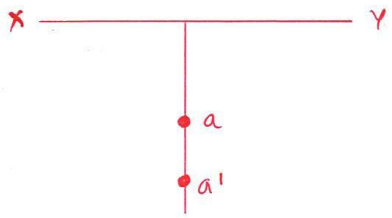
Q. No.	Example	Answer
1	What ratio of length to width (L: W) an arrow of a dimension line has? What is the value of L in mm? **[1]**	L:W = 3:1, L = 3 mm
2	What will be the locus of a point on the circumference of a generating circle when it rolls on another circle outside of it? **[1]**	Epicycloid
3	In the ellipse shown A and C are the two foci and B and D are any two points on the periphery of ellipse. Write the relation between AB, AD, BC and CD. **[1+1]**	AB + BC = AD + CD
4	A cutting plane is parallel to the generator of the cone. Name the curve it would generate. **[1]**	Parabola
5	Name the types of lines in the figure shown. **[2]**	
6	Write steps for obtaining true shape of a lamina. Also state the requisite condition. **[3+2]**	1. draw TV, FV as per information and select a line showing TL 2. draw X_1Y_1 perpendicular to TL and project a view on it (line view) 3. draw X_2Y_2 parallel to line view and project new view - true shape condition - Projected view on X_1Y_1 must be a line view.

7	Study the projection of points shown and formulate the problem for point a. **[4]** 	1. Point A is in HP 2. Point A is in front of VP 3. FV on XY TV below XY
8	Define plane of projection (POP). Write the name of the projection system that is commonly used. **[2]**	The lines of sight of the observer create the view of the object on the plane (screen) is called POP. Parallel projection system
9	Orthographic views are shown of the object. Name the views, dimensions, and name reference lines. **[1+1+1]** 	
10	Write an application of a long dashed dotted wide line. **[1]**	To show cutting planes
11	Write three steps for bisecting an arc AB. **[3]** 	1. with 'A' as centre and radius greater than half of AB mark two arcs on each side; 2. with 'B' as centre, mark two arcs intersecting the previous arcs 3. Join the intersecting point
12	State two advantages of diagonal scales over plain scales. **[2]**	1. Any distance can be measured upto two fractions(sub-divisions) 2. Least count obtained is smaller
13	A map on which 22 km is shown by a 44 cm long line. If a vernier scale is to be constructed to measure up to 5 km, what would be the LOS? **[2+2]**	$RF = \frac{44\text{ cm}}{22\text{ km}} = \frac{44}{(22\times1000\times100)} = \frac{1}{50000}$ $LOS = \frac{1}{50000} \times 5 \times 1000 \times 100 = 10\text{ cm}$
14	Write the relation between the directrix and the focus point. **[1]**	If a curve is traced by a point moving in a plane, the ratio of its dist. from a focus and the directrix is always constant.
15	In what circumstances an oblong method of ellipse is used? **[1]**	When the major and minor axes (conjugate axis) with the angle between them is given.

16	What is the relationship between cycloid and involute? **[1]**	An involute is the reverse of a cycloid
17	State the difference between an auxiliary plane and an oblique plane. **[1]**	Auxiliary Plane - inclined to HP or VP and perpendicular to an other RP. Oblique Plane - Inclined to both HP & VP
18	Name the methods of projecting side views. **[3]**	1. Projecting across meter line 2. Projecting through arcs 3. Projecting through 45° projectors
19	What is apparent angle with the vertical plane, draw a sketch. **[1+2]**	It is the angle which an oblique line makes with the VP in TV. 
20	If a line ab is parallel to the PP, what would be the sum of the inclinations of the line ab with the HP and the VP? **[1]**	$\theta + \phi \leq 90^\circ$
21	State the difference between AIP and AVP? **[1]**	AIP - inclined to HP, ⊥lar to VP AVP - inclined to VP, ⊥lar to HP
22	A square lamina is parallel to the VP, it will have vertical trace, horizontal trace or inclined trace and on which RP? **[1+1]**	Vertical trace (VT) Horizontal Plane (HP)
23	If a plane is inclined to both the RPs, write three important stages you will follow to draw projections. **[3]**	1. draw FV, TV of initial position 2. consider surface inclination, draw 2nd FV, TV 3. consider sideledge inclination, draw 3rd FV, TV.
24	In the projection of lines, what is the relation between the true inclinations and the apparent angles? **[1]**	Apparent angles are greater than true inclinations.
25	Name the curves and write eccentricity of point M. **[3+1]** $e = \frac{MF}{MM'}$	
26	Define eccentricity in terms of locus of a point. **[2]**	The locus of a point moving in a plane such that the ratio of its dist. from a fixed point and a fixed line is always constant.

27	Show tangent and normal at point Q on the parabola. **[2+2]**	
28	Define inferior trochoid and name various parts of it. **[2]**	If a curve is generated by a point inside the circle rolling along a straight line. a. generating circle, b. directing line
29	Top View is given. Identify the correct object. Put tick for correct and X for wrong object. **[2]** 	 ✓  X  ✓
30	Show parameters FV, TV, true inclinations, apparent angles, and the distance between end projectors in the figure shown. **[1+1+1+1+1]**	

31	Draw horizontal and vertical traces and name. **[2+2+1]**	
32	Three views are shown. Name them and identify the projection method. **[1+1]** 	
33	If an oblique line ab is in the first quadrant and $h_a > h_b$ and $d_a < d_b$, h indicates the height of points above XY and d distance. Draw views by hand and name parts. **[4]**	
34	Three incomplete views are shown, complete them from the object. Show changes in red color. **[3]** 	

35	Draw orthographic projections of the point A and name the projected points. **[5]** 	
36	What is the name and size of the drawing sheet you use for tutorial classes? **[1]**	A1, 841 × 594
37	To draw true shape of a lamina what view is necessary? **[1]**	One line-view is must
38	Write two wide applications of projection of solids? **[2]**	1. construction industry 2. 3-D modeling and animation
39	What is truncated solid? Show with a sketch truncated cone. **[1+1]**	When a solid is cut by a plane inclined to its base - called truncated solid. 
40	FV & TV (both are circles) of an elliptical plate are shown. Project a true shape. **[3.5+3.5]**