

## GANPAT UNIVERSITY

B. TECH SEM-1 &amp; II A11 BRANCH

EXAMINATION- APRIL-JUNE 2016

## 2ME102: Engineering Graphics

TIME: 3 HRS

TOTAL MARKS: 60

- Instructions: (1) Write section I&II in separate answer sheet  
 (2) Figures on right indicate marks of each question.  
 (3) Neat and Clean work is mandatory.  
 (4) Use H, 2H and HB pencil according to application.

## SECTION: I

Q.1

- (a)  $O_1ABO_2$  is a four bar chain with link  $O_1O_2$  as fixed link. Driving crank  $O_1A$  is 30 mm long. Driven crank  $O_2B$  is also 30 mm long. Connecting link  $AB$  is 90 mm long. Distance between  $O_1$  and  $O_2$  is 90 mm. Two cranks rotate in opposite directions. Draw the loci of points  $P$  and  $R$  for one complete revolution of the driving crank. The point  $P$  is the mid-point of the connecting link  $AB$  and point  $R$  is 35 mm from  $A$  on  $BA$  extended. (5)
- (b) Construct an Archimedean spiral of two revolution, given maximum and minimum radii as 100 mm and 40 mm respectively. Draw tangent and normal to the curve at any point. (5)

OR

Q.1

- (a) A pendulum  $OC$  at  $O$ , is 120 mm long. It swings  $30^\circ$  to the right of vertical and also  $30^\circ$  to left of vertical. Insect initially at  $O$  reaches the point  $C$ , When the pendulum completes two oscillations. Draw the path of the insect, Assuming motion of insect and pendulum uniform. (5)
- (b) A throw of ball from boundary of a cricket ground reaches the wicket keeper's gloves following the parabolic path. Maximum height achieved by ball above the ground 31 meters. Assume the point of throw and point of catching position 1 meter above the ground. Radial distance of boundary from wicket keeper is 75 meters. Construct the path of ball. (5)

Q.2

- (a) The front view of line  $AB$ , 90 mm long, measures 65 mm. Front view is inclined to  $xy$  line by  $45^\circ$ . Point  $A$  on  $V.P.$  and 20 mm below  $H.P.$  Point  $B$  is in third quadrant. Draw the projections and find inclinations of line with  $V.P.$  and  $H.P.$  (5)
- (b) A regular hexagonal plate, 50 mm side is resting on one of its corners in  $H.P.$  The diagonal through that corner is inclined at  $40^\circ$  to  $H.P.$  and (i) the plan of that diagonal inclined to  $V.P.$  by  $30^\circ$  and (ii) diagonal is inclined at  $30^\circ$  to  $V.P.$  Draw its projections. (5)

OR

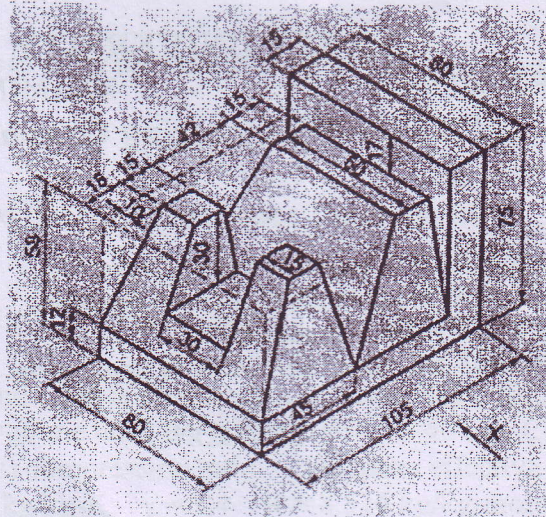
Q.2

- (a) The distance between end projectors of straight line  $PQ$  is 130 mm. Point  $P$  is 40 mm below  $H.P.$  and 25 mm in front of  $V.P.$  point  $Q$  is 75 mm above  $H.P.$  and 30 mm behind  $V.P.$  Draw the projections and find out all inclinations (5)
- (b) A regular pentagonal lamina, of 30 mm side, has its plane vertical and inclined at  $30^\circ$  to  $V.P.$  Draw its projections when one of its sides perpendicular to  $V.P.$  (5)



Q.3

Draw (I) Front view (II) Top view (III) L.H.S.V of the following object using 3<sup>rd</sup> angel projection system.



## SECTION: II

Q.4

- (a) A cone diameter of base 60 mm and height 70 mm, has one of its generators in H.P. and making an angle of  $45^\circ$  with V.P. Draw the projections of the cone (i) the apex is towards the observer (ii) the apex is away from the observer. (5)
- (b) A cylinder, diameter of base 43 mm and height 58 mm, is resting on H.P. on its base. It is cut by A.I.P. inclined at  $45^\circ$  to H.P. bisecting the axis. Draw three projections with sections and find the true shape of sections. (5)

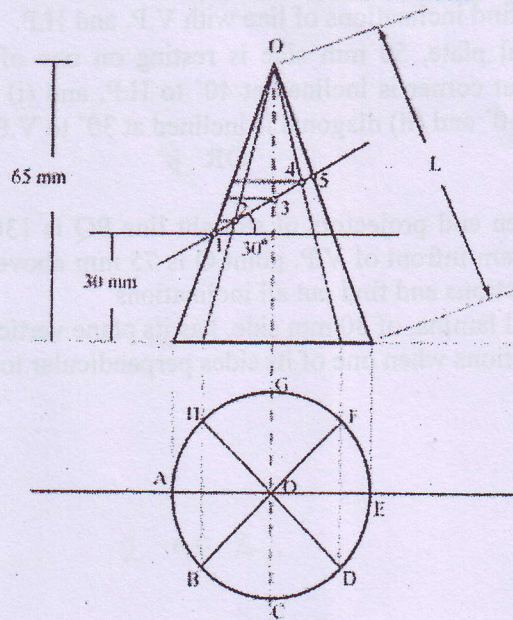
OR

Q.4

- (a) A cube, of 50 mm long edges is resting on H.P. on one of its corners with one of the body diagonals parallel to H.P. and (i) inclined at  $45^\circ$  to V.P. or (ii) Perpendicular to V.P. Draw the projections of the cube. (5)
- (b) A hexagonal prism is resting on H.P. on its base with two edges of base parallel to V.P. It is cut by A.I.P. perpendicular to V.P. and inclined to H.P. by  $45^\circ$  passing through a point of axis 40 mm above the base. Draw three principal projections and find the true shape of section, Take side of base 25 mm and height 50 mm. (5)

Q.5

A cone of base 50 mm diameter and height 65 mm rests with its base on H.P. A section plane perpendicular to V.P. and inclined at  $30^\circ$  to H.P. bisects the axis of the cone. Draw the development of the lateral surface of the truncated cone. (10)

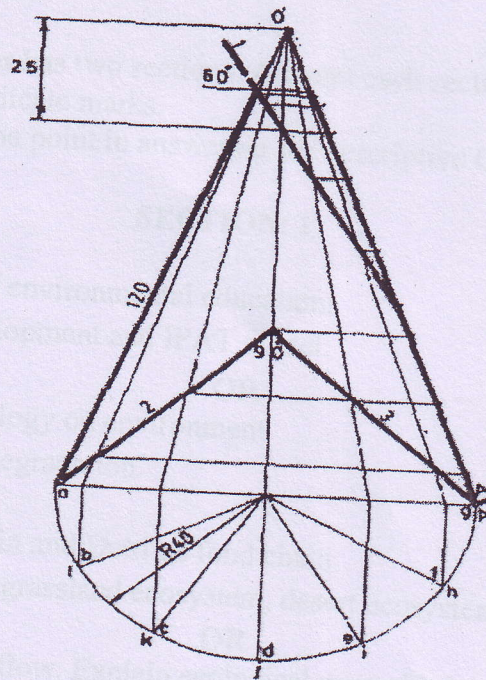




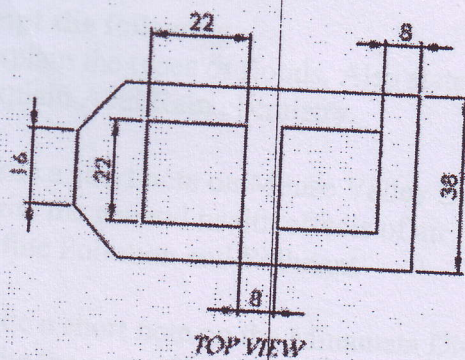
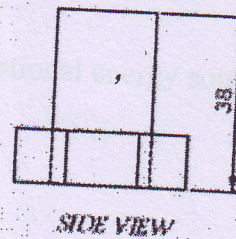
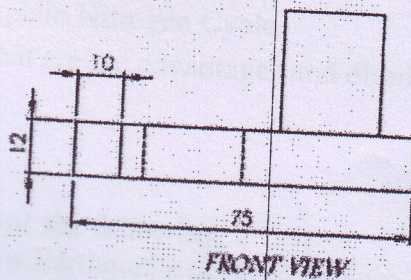
OR

Q.5

A cone, radius of base 40 mm and slant height 120 mm is resting on H.P. on its base. It is cut by three cutting planes perpendicular to V.P. and inclined to H.P. as shown in figure No. 1. Draw the development of the portion of cone between cutting planes. (10)



Q.6 Draw the isometric object from the following projections (10)



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