J.E.E. Main/ Advanced Foundation - XI Maths Worksheet

Time: 60 min **Chapter#12. Introduction to Three Dimensional Geometry** **Full Marks:**

Q.1 Using section formula, prove that the three points (– 2, 3, 5), (1, 2, 3) and (7, 0, –1) are collinear. (3 marks)

Q.2 A point is on the x-axis. What is its y-coordinate and z-coordinate? (1 mark)

Q.3 Write the coordinates of the mid-point of the line segment joining two points $P(x_1, y_1, z_1)$ and $Q(x_2, y_2, z_2)$. (1 mark)

Q.4 Find the equation of set of points P such that $PA^2 + PB^2 = 2k^2$, where A and B are the points (1, 2, 3) and (1, 0, 0), respectively. (3 marks)

Q.5 Prove that the points P(1, 2, 3), Q(–1, –1, –1) and R(3, 5, 7) are collinear. (2 marks)

Q.6 Find the coordinates of the point which divides externally the line segment joining the points (1, –2, 3) and (3, 4, –5) in the ratio 2 : 3. (1 mark)

Q.7 Find the image of (–2,3,4) in the yz- plane. (1 mark)

Q.8 Three vertices of a parallelogram ABCD are A(4, 0, 3), B (3, 4, – 2) and C (– 2, 0, 1). Find the coordinates of the fourth vertex. (3 marks)

Q.9 Find the point in XY-plane which is equidistant from three points A(2,0,3), B(0,3,2) and C(0,0,1). (3 marks)

Q.10 Name the octants in which the following points lie: (2, 3, 4), (1, –2, 6). (1 mark)

Q.11 Find the ratio in which the line joining the points (1, 2, 3) and (- 3, 4, - 5) is divided by the xy-plane. Also, find the coordinates of the point of division. (3 marks)

Q.12 A point P is at a distance of 6 units from the origin on the Z axis. Write the coordinates of P. (1 mark)

Q.13 Find centroid of a triangle, mid-points of whose sides are (1, 2, - 3), (2, 0, 1) and (- 1, 1, - 4). (5 marks)

Q.14 Find lengths of the medians of the triangle with vertices A (0, 0, 6), B (0, 4, 0) and (6, 0, 0). (5 marks)

Q.15 Find the ratio in which the YZ-plane divides the line segment formed by joining the points (-2,4,7) and (3,-5,8).

Q.16 Given that P (3, 2, –4), Q (5, 4, –6) and R (9, 8, –10) are collinear. Find the ratio in which Q divides PR. (2 marks)

Q.17 Write the coordinates of the centroid of triangle, whose vertices are $P(x_1, y_1, z_1)$, $Q(x_2, y_2, z_2)$ and $R(x_3, y_3, z_3)$. (1 mark)

Q.18 Are the points A(3, 6, 9), B(10, 20, 30) and C(25, -41, 5) the vertices of a right angles triangle? (3 marks)

Q.19 Find the distance between the points P(1, 0, 4) and Q (– 4, 1, 0). (1 mark)

Q.20 Find the locus of the point which is equidistant from the points A(0,2,3) and B(2,–2,1). (3 marks)