Brain International School

Vikas Puri, New Delhi

ASSIGNMENT NO. 4

SUBJECT: MATHEMATICS **CLASS-X I** **NOVEMBER,26**

CHAPTER 3D

Ques1 The point on x-axis which is equidistant from the points (3, 2, 2) and (5, 5, 4) is

(a) $\left(\frac{49}{4}, 0,0\right)$ (b) $\left(\frac{23}{2}, 0,0\right)$ (c) $\left(-\frac{49}{4}, 0,0\right)$ (d) (2, 0, 0)

Ques2 The points on z-axis which are at a distance of 6 units from the point (-4, 2, -1) are

(a) (0, 0, ± 5) (b) (0, 0, ± 3) (c) (0, 0, 3) (d) (0, 0, -3)

Ques3 Three consecutive vertices of a parallelogram ABCD are A (3, -1, 2), B (1, 2, -4) and C (-1, 1, 2), the fourth vertex D is

(a) (-1, 2, 8) (b) (1, -2, 8) (c) (-4, 2, 6) (d) (4, 2, 6)

Ques4 A point R with x-coordinate 4 lies on the line segment joining the points P (2, -3, 4) and Q (8, 0, 10). The coordinates of R are

(a) (4, -2, 6) (b) (-4, -2, 6) (c) (-4, 2, 6) (d) (4, 2, 6)

Ques5 If origin is the centroid of a triangle ABC having vertices A (a, 1, 3), B (-2, b, -5) and C (4, 7, c), then the values of a, b, c are

(a) -2, 8, 2 (b) 2, 8, -2 (c) 2, -8, 2 (d) -2, -8, 2

Ques6 The ratio in which the line segment joining the points A (4, 8, 10) and B (6, 10, -8) is divided by yz-plane is

(a) 2 : 3 internally (b) 2 : 3 externally (c) 3 : 2 internally (d)3 : 2 externally

Ques7 x-axis is the intersection of two planes

(a) xy and yz (b) yz and zx (c) xy and xz (d) none

Ques8 The point (-2, -3, -4) lies in the

(a) first octant (b) seventh octant (c) second octant (d) eighth octant

Ques 9 The locus of a point for which y = 0, z = 0 is

(a) equation of x-axis (b) equation of y-axis

(c) equation of z-axis (d) none

Ques10 The locus of a point for which x = 0 is

(a) xy plane (b) yz plane (c) zx plane (d) none

Ques11 What is the length of perpendicular drawn from a point P (3, 4, 5) on y-axis

(a) $\sqrt{41}$ units (b) $\sqrt{34}$ units (c) 5 units (d) none

Ques12 The distance of the point P (-3, 4, 5) from yz-plane is

(a) 3 units (b) 4 units (c) 5 units (d) none

Ques13 L is the foot of the perpendicular drawn from a point P (3, 4, 5) on the xy-plane. The coordinates of point L are

(a) (3, 0, 0) (b) (0, 4, 5) (c) (3, 0, 5) (d) (3, 4, 0)

Ques14 L is the foot of perpendicular drawn from a point P (3, 4, 5) on x-axis. The coordinates of L are

(a) (3, 0, 0) (b) (0, 4, 0) (c) (0, 0, 5) (d) (0, 4, 5)

Ques 15. Show that the points (-2,3,5), (1,2,3) and (7,0,1) are collinear.

Q 16. Find the equation of the set of the points P, the sum of whose distance from A(4,0,0) and B(-4,0,0) is equal to 10.

Ques17. Find the lengths of the medians of the triangle with vertices A (0, 0, 6), B (0,4, 0) and (6, 0, 0).

Ques 18. If the origin is the centroid of the triangle PQR with vertices P (2a, 2, 6), Q (– 4, 3b, –10) and R(8, 14, 2c), then find the values of a, b and c.

Ques19. Find the coordinates of a point equidistant from the four points O (0, 0, 0), A (l, 0, 0), B (0, m, 0) and C (0, 0, n).

Ques20. Find the point on x-axis which is equidistant from the point A (3, 2, 2) and B (5, 5, 4).
Ques 21. The mid-points of the sides of a triangle are (5, 7, 11), (0, 8, 5) and (2, 3, – 1). Find its vertices.

CHAPTER LIMITS AND DIFFERENTIABILITY

Ques1 $\lim_{x\to 0}\frac{\sqrt{4+x}-2}{sinx}$ is equal to

(a) 4 (b) 1 (c) $\frac{1}{4}$ (d) 0

Ques2 If $\frac{x^9-a^9}{x-a}=\lim_{x\to 5}(x+4)$, then all possible real values of a are

(a) 2, 3 (b) -2, 2 (c) -1, 1 (d) -3, 3

Ques3 Let $f(x)=\begin{cases}x+2, & x\le -1\\ cx^2, & x>-1\end{cases}$. If $\lim_{x\to -1} f(x)$ exists, then c is

(a) -1 (b) 1 (c) 2 (d) -2

Ques4 $\lim_{x\to 0}\frac{1-cos2x}{sin^2 2x}$ is equal to

(a) 2 (b) -2 (c) $\frac{1}{2}$ (d) $-\frac{1}{2}$

Ques5 $\lim_{x\to 0}\frac{tan3x-2x}{3x-sin^2 x}$ is equal to

(a) $\frac{1}{3}$ (b) $-\frac{1}{3}$ (c) $\frac{1}{2}$ (d) $-\frac{1}{2}$

Ques6 $\lim_{x\to 0}\frac{1-\cos mx}{1+\cos nx}$ is equal to

(a) $\frac{n^2}{m^2}$ (b) $\frac{m^2}{n^2}$ (c) $\frac{m}{n}$ (d) $\frac{n}{m}$

Ques7 $\lim_{x\to 0}\frac{cosx-cos3x}{x(sin3x-sinx)}$ is equal to

(a) $-\frac{2}{3}$ (b) $\frac{1}{3}$ (c) $-\frac{1}{2}$ (d) 2

Ques8 $\lim_{x\to 0}\frac{(1-cos2x)sin5x}{x^2\, sin3x}$ is equal to

(a) $\frac{6}{5}$ (b) $\frac{5}{6}$ (c) $\frac{10}{3}$ (d) $\frac{3}{10}$

Ques9 If $\lim_{x\to 0} kx\ cosec\ x=\lim_{x\to 0} x\ cosec\ kx$, then k is

(a) -1, 1 (b) -2, 2 (c) $-\frac{1}{2},\frac{1}{2}$ (d) none

Ques10 $\lim_{x\to\frac{\pi}{2}}\frac{tan2x}{x-\frac{\pi}{2}}$ is equal to

(a) $\frac{1}{2}$ (b) 2 (c) $-\frac{1}{2}$ (d) 3

Ques11 $\lim_{x\to 0}\frac{e^x+sinx-1}{3x}$ is equal to

(a) $\frac{1}{3}$ (b) $-\frac{1}{3}$ (c) $\frac{2}{3}$ (d) $-\frac{2}{3}$

Ques12 $\lim_{x\to 2}\frac{\log(x-1)}{x-2}$ is equal to

(a) 0 (b) -1 (c) $\frac{1}{2}$ (d) 1

Ques13 $\lim_{x\to 0}\frac{3^{2x}-2^{3x}}{x}$ is equal to

(a) $2\log\frac{3}{2}$ (b) $3\log\frac{2}{3}$ (c) $\log\frac{9}{8}$ (d) $\log\frac{8}{9}$

Ques14 $\lim_{x\to 0}\frac{|x|}{x}$ is equal to

(a) 1 (b) -1 (c) 0 (d) does not exist

Ques15 $\lim_{x\to\frac{3}{2}}[x]$ is equal to

(a) 1 (b) -1 (c) 2 (d) does not exist

Ques16. Evaluate the following limits:

i) $\lim_{x\to o}\frac{\cos 2x-1}{\cos x-1}$ (ii) $\lim_{x\to 0}(cosec\ x-\cot x)$ (iii) $\lim_{x\to\frac{\pi}{2}}\frac{\tan 2x}{x-\frac{\pi}{2}}$ (iv) $\lim_{x\to 1}\frac{(2x-3)(\sqrt{x}-1)}{2x^2+x-3}$ (v) $\lim_{x\to 2}\frac{x^3+4x-16}{2x^3-3x-10}$

(vi) $\lim_{x\to a}\frac{\sqrt{x+2a}-\sqrt{3x}}{\sqrt{x+3a}-2\sqrt{x}}$ (vii) $\lim_{x\to\frac{\pi}{2}}\frac{1-\sin x}{(\pi-2x)^2}$ (viii) $\lim_{x\to\frac{\pi}{4}}\frac{\cos x-\sin x}{\cos 2x}$ (ix) $\lim_{x\to\frac{\pi}{4}}\frac{sec^2x-2}{\tan x-1}$

(x) $\lim_{x\to\frac{\pi}{4}}\frac{1-tan^2x}{\cos x-\sin x}$ (xi) $\lim_{x\to 0}\frac{1-\cos x\sqrt{\cos 2x}}{x^2}$ (xii $\lim_{x\to\frac{\pi}{2}}\sec x\ -\tan x$ (xiii $\lim_{x\to\frac{\pi}{6}}\frac{2sin^2x+\sin x-1}{2sin^2x-3\sin x+1}$

(xiv) $\lim_{x\to\frac{\pi}{6}}\frac{\sqrt{3}\sin x-\cos x}{x-\frac{\pi}{6}}$ (xv) $\lim_{x\to 0}\frac{\tan 3x-2x}{3x-sin^2x}$ (xvi) $\lim_{x\to 0}\frac{\sin x-2\sin 3x+sin5x}{x^3}$ (xvii) $\lim_{h\to 0}\frac{(x+h)^2\sin(x+h)-x^2sin\,x}{h}$