Mark {a,b,c,or d} for the correct answer in the space below for Q.1. - Q.10 Marks 10 x 2 = 20

Q.No.	1	2	3	4	5	6	7	8	9	10
Select from {a,b,c,d}										

Q.1. Let $f(x)=x^{-3}$, $g(x)=x^3$, **then** $(gof)(x)$ **is**

(a)1, (b) x^{-6} **(c)** x^{-9}, **(d)** x^{-27}.

Q.2. The solution set of the inequality $0<|x|<1$, **is**

(a) (-1, 0)U(0, 1) , (b) (-1 , 0) (c) (0, 1) , (d) None of these.

Q.3. The domain of the function $f(x)=\dfrac{\sqrt{x-6}}{\sqrt{9-x}}$,

(a) $(-\infty, \infty)-\{2\}$, **(b) (6,** $+\infty$**), (c) (6 , 9) , (d) None of these.**

Q.4. If $\lim\limits_{x\to 1}\dfrac{f(x)}{x^3}=1$, **then *f(x)* is continuous at *x = 1* if *f(1)* is equal to**

(a) -1 , (b) 1 , (c) 0, (d) None of these.

Q.5. If $\lim\limits_{x\to 0}\dfrac{3x^2}{\sin^2(4x)}=k,$ **,then ' *k* ' is equal to**

(a) $\dfrac{3}{16}$, **(b)** $\dfrac{3}{4}$, **(c)** $\dfrac{4}{3}$, **(d) None of these.**

Q.6. If $\lim\limits_{x\to -\infty}\dfrac{\sqrt{4x^2+x+1}}{x}=c$ **, then c is equal to**

(a) 2, (b) *4* (c) *- 2*, (d) None of these.

Q.7. The function $f(x)=1+x^{\frac{3}{7}}$ **has**

(a) vertical tangent at x = 0, (b) a cusp at (0,1), (c) vertical asymptote, (d) None of these.

Q.8. The graph of $f(x)=\dfrac{(x+1)^2}{x^2+2x}$ **has vertical asymptotes**

(a) $x=-\dfrac{1}{2}$ ***and x = -1* , (b) *x= 0 and x = -2*, (c) *x= 2 and x = -1*, (d) None of these.**

Q.9. If $f(x)=\sqrt{x}\sin x$, **then** $f'(0)$ **is**

(a) 0 (b) 1, (c) doe not exist, (d) None of these.

Q. 10. The slope of the tangent line to the graph of $f(x)=x^2-4x+4$ **at (1, 1) is**

(a) 2 , (b) -4, (c) 1, (d) None of these.

Question. 11. Solve the inequality

$$\frac{x-1}{3} \geq \frac{2}{x}$$ **[4]**

Question.12. If $f(x) = \frac{x}{3x+2}$ **and** $g(x) = \frac{2}{x}$**, find x such that** $(fog)(x) = 1$**.** **[3]**

Question. 13.
Find the limit, if exists

$$\lim_{x \to 2} \frac{\frac{x}{x+1} - \frac{2}{3}}{x-2}$$ **[4]**

Question. 14.If

$$f(x) = \begin{cases} x^2 + ax + b, & \text{if } x \geq 1 \\ 2bx - 2, & \text{if } 0<x<1, \\ x + a, & \text{if } x \leq 0 \end{cases}$$ **[4]**

Find constants a **and** b **so that f(x) is continuous at** $x = 0$ **and** $x = 1$**.**

Question. No. 15. Use the definition to find the derivative of $f(x) = \sqrt{x+2}$ **. Hence find the equation of the tangent to** $f(x) = \sqrt{x+2}$ **at** $x = 0$ **.** **[5]**

Q.No.	1	2	3	4	5	6	7	8	9	10
Select from {a,b,c,d}	*c*	*a*	*d*	*b*	*a*	*c*	*a*	*b*	*c*	*d*