SEAT NUMBER - | | | | | | |

# Dnyansagar Coaching Classes, A'nagar

## MHT-CET

| Std. - XII | *(Derivative &Application of derivative)* | Time - 45 min. |
|---|---|---|
| Sub- Math -II | | Max Marks - 50 |

**1)** **If** $f(x) = \cot^{-1}(\cos 2x)^{1/2}$ **then** $f'\left(\frac{\pi}{6}\right) =$

a) $\frac{1}{\sqrt{3}}$ b) $\frac{2}{\sqrt{3}}$

c) $\sqrt{\frac{2}{3}}$ d) $-\frac{2}{\sqrt{3}}$

**2)** **If f(x) is an odd differentiable function defined on** $(-\infty,\infty)$ **such that** $f'(3) = 2$ **then** $f'(-3) =$

a) 0 b) 1

c) 2 d) 4

**3)** **The function f(x) =** $(x-a)\sin\frac{1}{(x-a)}$ **for** $x \neq a$ **f(a) = 0 is**

a) Continuous but not derivable at $x = a$

b) not continuous at x= a

c) derivable at x = a

d) none of these

**4)** **The equation of the common tangent to the curves $y^2 = 8x$ and xy = -1 is**

a) 3y = 9x + 2 b) y = 2x + 1

c) 2y = x + 8 d) y = x + 2

**5)** **If** $y = \tan^{-1}\left(\frac{5ax}{a^2+6x^2}\right)$ $a \neq 0$ **then** $\frac{dy}{dx} =$

a) $\frac{6a}{a^2+36x^2} + \frac{a}{a^2+x^2}$

b) $\frac{6a}{a^2+36x^2} - \frac{a}{a^2+x^2}$

c) $\frac{3a}{a^2+9x^2} + \frac{a}{a^2+4x^2}$

d) None of these

**6)** **The two curves** $x^3 - 3xy^2 + 2 = 0$ **and** $3x^2y - y^3 - 2 = 0$

a) cut at right angles

b) touch each other

c) cut at an angle $\frac{\pi}{3}$

d) cut at an angle $\frac{\pi}{4}$

**7)** **If** $f(x) = \log x - e^x$ **then at** $x = 1$ $f'(x) =$

a) 1 - e b) -e

c) 1 + e d) 1

**8)** $\frac{d}{dx}\left[\tan^{-1}(\sec x + \tan x)\right] =$

a) 0 b) $\sec x - \tan x$

c) $\frac{1}{2}$ d) 2

**9)** **In the interval [-1, 5] the function** $f(x) = x^3 - 6x^2 + 9x + 2$ **has minimum value**

a) 6 b) 2

c) 22 d -14

**10)** **If** $y = \log\left(a^x\sqrt{\frac{x-4}{3x-4}}\right)$ **then** $\frac{dy}{dx} =$

a) $\log a - \frac{12}{(x-4)(3x-4)}$

b) $\log a - \frac{4}{(x-4)(3x-4)}$

c) $\log a + \frac{4}{(x-4)(3x-4)}$

d) $\log a + \frac{12}{(x-4)(3x-4)}$

**11)** **If a particle is moving in a straight line according to the law** $S = \frac{t^3}{3} - \frac{t^2}{2} - 6t + 5$ **then its acceleration at point where velocity is zero is**

a) 4 b) -4
c) -5 d) 5

**12)** **Let f : R→R be such that** $f(1)=3$ **and** $f'(1)=6$ **Then** $\lim_{x\to 0}\left(\frac{f(1+x)}{f(1)}\right)^{\frac{1}{x}}=$

a) 1 b) $e^{\frac{1}{2}}$
c) $e^2$ d) $e^3$

**13)** **If** $f(x)=x^3-9x^2+15x+3$ **then the stationary values of the function**

a) 10, 22 b) 10, -22
c) -10, 22 d) none of these

**14)** **If** $x=a\left(\frac{1-t^2}{1+t^2}\right)$ **&** $y=\frac{bt}{1+t^2}$ **then** $\frac{dy}{dx}=$

a) $\frac{x}{y}$ b) $\frac{-x}{y}$
c) $\frac{b^2x}{a^2y}$ d) $\frac{-b^2x}{a^2y}$

**15)** **If** $\cos\left(\frac{x^2-y^2}{x^2+y^2}\right)=\tan a$ **, then** $\frac{dy}{dx}=$

a) $\frac{y}{x}$ b) $\frac{-y}{x}$
c) $\frac{x}{y}$ d) $\frac{-x}{y}$

**16)** **The function** $f(x)$ **is defined by** $f(x)=(x+2)e^{-x}$ **is**

a) decreasing for all $x$
b) decreasing in $(-\infty, -1)$ & increasing in $(-1, \infty)$
c) increasing for all x
d) decreasing in $(-1, \infty)$ & increasing in $(-\infty, -1)$

**17)** **Differential co-eff. of** $\cos^{-1}\sqrt{x}$ **w.r.t.** $\sqrt{1-x}$ **is**

a) $\sqrt{x}$ b) $-\sqrt{x}$
c) $\frac{1}{\sqrt{x}}$ d) $\frac{-1}{\sqrt{x}}$

**18)** **If** $x+y=k$ **is normal to** $y^2=12x$ **then *k* is**

a) 3 b) 9
c) -9 d) -3

**19)** **If** $f(x+y)=f(x)\cdot f(y)\quad \forall x, y$ **&** $f(5)=2$, $f'(0)=3$ **then** $f'(5)$ **is**

a) 0 b) 1
c) 6 d) 2

**20)** **If** $f(x)=\frac{x-4}{2\sqrt{x}}$ **then** $f'(0)$ **is**

a) 0 b) 1
c) does not exist d) none of these

**21)** **The angle between the curves** $y=\sin x$ **&** $y=\cos x$ **is**

a) $\tan^{-1}(\sqrt{2})$ b) $\tan^{-1}(2\sqrt{2})$
c) $45^0$ d) $90^0$

**22)** **If** $y=(3x^2-2)(4x^2+1)$ **then** $\frac{dy}{dx}=$

a) $2x(12x^2-5)$ b) $2x(24x^2-5)$
c) $2(12x^2-5)$ d) $x(24x^2-5)$

**23)** **The gradient of the curve** $y=x^2+p(x)+q$ **at the point (2, 6) is 7 The value of *p* & *q* are**

a) $p=3, q=4$ b) $p=-4, q=3$
c) $p=-3, q=4$ d) $p=3, q=-4$

**24)** **If** $=\cfrac{\sin x}{\sqrt{1+\cos x}}\Big/\sqrt{1+\sin x}\Big/\sqrt{1+\frac{\cos x}{1}}+\ldots\ldots$, then $\frac{dy}{dx}=$

a) $\frac{(1+y)\cos x+y\sin x}{1+2y+\cos x-\sin x}$

b) $\frac{(1+y)\cos x-y\sin x}{1+2y+\cos x+\sin x}$

c) $\frac{(1+y)\cos x-y\sin x}{1+2y-\cos x+\sin x}$

d) None of these

**25)** **The function** $f(x)=\tan x$ **for all real** $x\neq\pm\frac{\pi}{2}, \pm\frac{3\pi}{2}$ **..... is**

a) increasing
b) decreasing
c) neither increasing nordecreasing
d) none of these

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|---|---|---|
| Sub- Math -II | *Answersheet* | Max Marks - 50 |

1. c
2. c
3. a
4. d
5. b
6. a
7. a
8. c
9. d
10. c
11. d
12. c
13. b
14. d
15. a
16. d
17. c
18. b
19. c
20. c
21. b
22. b
23. d
24. a
25. a