MATHS

BOOKS - CAREER POINT

MOCK TEST 10

Part C Maths

1. If the joining the points (0,3) and (5,-2) is a tangent to the curve $y = \frac{c}{X+1}$, then value of c is -

A. 1

B. -2

C. 4

D. -4

Answer: 3

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2. The interval in which the function f(x)=sin x-cos x -ax +b decreases for all real values of x is given by

A. $a \geq \sqrt{2}$

B. $a \geq 1$

C. $a < \sqrt{2}$

D. $a < 1$

Answer: 1

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3. Set of values of b for which local extrema of the function f(x) are positive where $f(x) = \frac{2}{3}a^2x^3 - \frac{5a}{2}x^2 + 3x + b$ and maximum occurs at $x = \frac{1}{3}$ is -

A. $(-4, \infty)$

B. $(-3/8, \infty)$

C. $(-10, 3/8)$

D. None of these

Answer: 2

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4. If $z = \left(\frac{1+i\sqrt{3}}{1+i}\right)^{25}$, then arg(z) is equal to

A. $\frac{\pi}{12}$

B. $-\frac{\pi}{12}$

C. $\frac{7\pi}{12}$

D. $\frac{3\pi}{12}$

Answer: 1

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5. In which of the following is false

A. (A'OB)=AOB

B. (A'capA)=U

C. (AOB)=AOB

D. None of these

Answer: 4

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6. The number of real roots of $(x-1)^4+(x+1)^4=16$ is

A. 0

B. 1

C. 2

D. 3

Answer: 3

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7. The differential equation $\frac{dy}{dx} + Py = Qy^n,\ n > 2$ can be reduced to linear form y substituting $z = y^{n-1}$ b. $z = y^n$ c. $z = y^{n+1}$ d. $z = y^{1-n}$

A. $z = y^{n-1}$

B. $z = y^n$

C. $z = y^{n+1}$

D. $z = y^{1-n}$

Answer: 4

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8. Two tangents are drawn to the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ such that product of their slope is c^2 . the locus of the point of intersection is

A. $x^2 - a^2 = c^2(y^2 + b^2)$

B. $x^2 + a^2 = c^2(y^2 - b^2)$

C. $y^2 + b^2 = c^2(x^2 - a^2)$

D. None of these

Answer: 3

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9. The value of $\int 2^{mx}.3^{nx}dx$ (when m, $n \in N$) is equal to:

A. $\frac{2^{mx} + 3^{nx}}{m\ln 2 + n\ln 3} + C$

B. $\frac{e^{(m\ln 2 + n\ln 3)}x}{m\ln 2 + n\ln 3} + C$

C. $\frac{2^{mx}.3^{nx}}{\ln(2^m.3^n)} + C$

D. None

Answer: 3

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$$\int_{-10}^{0} \left| \frac{\frac{2[x]}{3x-[x]}}{\frac{2[x]}{3x-[x]}} \right| dx$$

10. dx is equal

to ([.] is g.i.f.)

A. 10

B. $\frac{28}{3}$

C. $\frac{29}{3}$

D. None of these

Answer: 2

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11. if $y = \tan^{-1} x + \tan^{-1} \frac{1}{x} + \sec^{-1} x, then \quad y \in$

A. $\left[\frac{\pi}{2}, \pi\right) \cup \left(\pi, \frac{3\pi}{2}\right]$

B. $\left[\frac{\pi}{2}, \frac{3\pi}{2}\right]$

C. (o, π)

D. $\left[o, \frac{\pi}{2}\right) \cup \left[\frac{\pi}{2}, \pi\right)$

Answer: 3

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12. A student is to answer 10 out of 13 questions in an examination such that he must choose at least 4 from the first five questions. The number of choices available to him is

A. 346

B. 140

C. 196

D. 280

Answer: 3

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13. One of the roots of the equation $8x^3 - 6x + 1 = 0$ is

A. $\cos 10^\circ$

B. $\cos 80^\circ$

C. $\cos 30^\circ$

D. $\sin 30^\circ$

Answer: 2

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14. In the interval $\left[-\frac{\pi}{2}, \frac{\pi}{2}\right]$ the equation $\log_{\sin\theta}(\cos 2\theta) = 2$ has

A. no solution

B. a unique solution

C. two solution

D. infinitely many solutions

Answer: 2

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15. Let

$f(x) = \left(x^2 - 3x + 2\right)\left(x^3 - 6x^2 + 11x - 6\right)| + |\sin\left(x + \frac{\pi}{4}\right)|$ The set of points at which the function f(x) is not differentiable in $[0, 2\pi]$ is

A. $\left\{1, 2, 3, \frac{3\pi}{4}, \frac{7\pi}{4}\right\}$

B. $\{1, 2, 3\}$

C. $\left\{3, \frac{3\pi}{4}, \frac{7\pi}{4}\right\}$

D. $\left\{\frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}\right\}$

Answer: 3

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16. Let p : price increases q : Demand falls The symbolic statements fo 'if demand does not fall then price does not increases' is

A. $q \to p$

B. $\sim q \to p$

C. $\sim q \rightarrow \sim p$

D. $\sim q \leftrightarrow \sim p$

Answer: 3

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17. Angle of elevation of top of a tower from a point 'A' due $E30^\circ N$ of tower on the ground is 45°. While angle of elevation of top of tower from a point 'B' due $N60^\circ W$ of tower is 30° where AB=50 m, then height of tower is

A. $\frac{50}{\sqrt{4-\sqrt{3}m}}$

B. $50\sqrt{4-\sqrt{3}m}$

C. $\frac{50}{\sqrt{4+\sqrt{3}m}}$

D. None of these

Answer: 3

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18. In an experiment with 15 observations of x the following results were available $\sum x^2 = 2830 \sum x = 170$ one observation that was 20 was found to be wrong and it was replaced by its correct value of 30 Then the corrected variance is (1) 8.33 (2) 78 (3) 188.66 (4) 177.33

A. 78.0

B. 188.66

C. 177.33

D. 8.33

Answer: 1

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19. The shortest distance between line $\frac{x-3}{3} = \frac{y-8}{-1} = \frac{z-3}{1}$ and $\frac{x+3}{-3} = \frac{y+7}{2} = \frac{z-6}{4} is$

A. $\sqrt{30}$

B. $2\sqrt{30}$

C. $5\sqrt{30}$

D. $3\sqrt{30}$

Answer: 4

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20. Ratio of volumes of tetrahedrons having coterminus edees $\bar{a}+\bar{b}, \bar{b}+\bar{c}, \bar{c}+\bar{a}$ and $\bar{a}, \bar{b}, \bar{c}$ respectively is equal to

A. $1:1$

B. $2:1$

C. $3:1$

D. $4:1$

Answer: 2

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21. Table

$$If \Delta_r = \begin{vmatrix} (2r) & x & N(N+1) \\ (6r^2-1) & y & N^2(2N+3) \\ (4r^3-2Nr) & z & N^3(N+1) \end{vmatrix}$$

where N $\in$ natural numbers. Then $\sum_{r=1}^{N} \Delta_r$ is

A. N

B. N^2

C. Zero

D. None of these

Answer: 3

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22. If $x = a\cos\theta, y = b\sin\theta,$ then $\frac{d^3y}{dx^3}$ is equal to

A. $\frac{-3b}{a^3}\cos ec^4\theta\cot^4\theta$

B. $\frac{3b}{a^3}\cos ec^4\theta\cot\theta$

C. $\frac{-3b}{a^3}\cos ec^4\theta\cot\theta$

D. None of these

Answer: 3

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23. The circles $ax^2+ay^2+2g_1x+2f_1y+c_1=0$ and $bx^2+by^2+2g_2x+2f_2y+c_2=$ $(a\neq 0 \text{ and } b\neq 0)$ cut orthogonally, if

A. $g_1g_2+f_1f_2=ac_1+bc_2$

B. $2(g_1g_2+f_1f_2)=bc_1+ac_2$

C. $bg_1g_2+af_1f_2=bc_1+ac_2$

D. $g_1g_2+af_1f_2=c_1+c_2$

Answer: 2

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24. If AB is a focal chord of $x^2 - 2x + y - 2 = 0$ whose focus is S and $AS = l_1$, then find BS.

A. $\frac{l_1}{2l_1 - 1}$

B. $\frac{l_1}{4l_1 - 1}$

C. $\frac{l_1}{2l_1 + 1}$

D. None of these

Answer: 2

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25. If $y = y(x)$ and $\frac{2 + \sin x}{y + 1}\left(\frac{dy}{dx}\right) = -\cos x, y(0) = 1$, then $y\left(\frac{\pi}{2}\right)$ equals (a) $(b)(c)(d)\frac{1}{e}3(f)(g)(h)$ (i) (b) $(j)(k)(l)\frac{2}{m}3(n)(o)(p)$ (q) (c)

$(r)(s) - (t)\frac{1}{u}3(v)(w)(x)$ (y) (d) 1

A. $\frac{1}{3}$

B. $\frac{2}{3}$

C. $-\frac{1}{3}$

D. 1

Answer: 1

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26. The area bounded by the curve $y = \left[\frac{x^2}{64} + 2\right], y = x - 1, y = x - 1$ and $x = 0$ above the x-axis will be-(Where [] represents greatest integer function)

A. 2

B. 3

C. 4

D. non of these

Answer: 3

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27. If the function $f(x) = x^3 + 3(1-7)x^2 + 3\left(a^2 - 9\right)x - 1$ has a positive point Maximum , then

A. $a \in (3, \infty) \cup (-\infty, -3)$

B. $a \in (-\infty, -3) \cup (3, 29/7)$

C. $(-\infty, 7)$

D. $(-\infty, 29/7)$

Answer: 2

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28. The range of $f(x) = [1 + \sin x] + \left[2 + s \in \frac{2}{x}\right] + \left[3 + s \in \frac{x}{3}\right] + + \left[n + s \in \frac{x}{n}\right] \forall x$, where [.] denotes the greatest integer function, is,

$\left\{\frac{n + n - 2^2}{2}, \frac{n(n+1)}{2}\right\}$ $\left\{\frac{n(n+1)}{2}\right\}$

$\left\{\frac{n^2 + n - 2^{\square}}{2}, \frac{n(n+1)}{2}\frac{n^2 + n + 2}{2}\right\}$ $\left[\frac{n(n+1)}{2}, \frac{n^2 + n + 2}{2}\right]$

A. $\left\{\frac{n^2 + n - 2}{2}, \frac{n(n+1)}{2}\right\}$

B. $\left\{\frac{n(n+1)}{2}\right\}$

C. $\left\{\frac{n^2 + n - 2}{2}, \frac{n(n+1)}{2}, \frac{n^2 + n + 2}{2}\right\}$

D. $\left\{\frac{n(n+1)}{2}, \frac{n^2 + n + 2}{2}\right\}$

Answer: 4

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29. If sum $\frac{1}{7} + \frac{1.3}{7.9} + \frac{1.3.5}{7.9.11} + \ldots.$ up to 20 terms is equal to $\frac{\mathrm{m}}{\mathrm{n}}$, proper fraction, then n - 4m =

A. 1

B. 2

C. 3

D. 4

Answer: 1

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30. A and B toss a coin alternately till one of them gets a head and wins the game. If A starts the game, find the probability that B will win the game.

A. $1/2$

B. $1/3$

C. $1/4$

D. $1/5$

Answer: 2

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