MATHS

BOOKS - CAREER POINT

MOCK TEST 9

Maths

1. OAB is a triangle in the horizontal plane through the foot P of the tower at the middle point of the side OB of the triangle. If $OA = 2m, OB = 6m, AB = 5m$ and $\angle AOB$ is equal to the angle subtended by the tower at $A,$ then the height of the tower is

A. $\sqrt{\frac{11 \times 39}{25 \times 3}}$

B. $\sqrt{\frac{11 \times 39}{25 \times 2}}$

C. $\sqrt{\frac{11 \times 25}{39 \times 2}}$

D. None of these

Answer: 2

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2. If $\vec{x}$ and $\vec{y}$ are two non-collinear vectors and ABC is a triangle with side lengths a,b and c satisfying (20a-15b) $\vec{x}$ + (15b-12c) $\vec{y}$ + (12c-20a) $\vec{x} \times \vec{y}$ is:

A. an acute angled Delta

B. an obtuse angled Delta

C. a right angled Delta

D. an isosceles Delta

Answer: 3

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3. If the volume of tetrahedron $ABCD$ is 1 cubic units, where $A(0, 1, 2), B(-1, 2, 1) and C(1, 2, 1),$ then the locus of point D is a. $x + y - z = 3$ b. $y + z = 6$ c. $y + z = 0$ d. $y + z = -3$

A. x+y-z=3

B. y+z=6

C. y+z=-3

D. None of these

Answer: 2

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4. The equation of the plane passing through the lines $\frac{x-4}{1} = \frac{y-3}{1} = \frac{z-2}{2}$ and $\frac{x-3}{1} = \frac{y-2}{-4} = \frac{z}{5}$, is

A. 11x-y-3z=35

B. 11x+y-3z=35

C. 11x-y+3z=35

D. None of these

Answer: 4

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5. The Delta with vertices $(x_i, y_i)i = 1, 2, 3$is inscribed in the circle$x^2 + y^2 = a^2$.The orthocentre of the Delta is

A. $(- Sigmaxi, \ - \Sigma yi)$

B. $(Sigmaxi, \ - \Sigma yi)$

C. $(\Sigma x_i, \Sigma y_i)$

D. $\left(\frac{1}{3}\Sigma xi, \frac{1}{3}\Sigma yi\right)$

Answer: 3

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6. If the line px + qy =1 is a tangent to the parabola y^2 =4ax, then

A. $p^2 - aq = 0$

B. $p + aq^2 = 0$

C. $p - aq^2 = 0$

D. $p - 2aq^2 = 0$

Answer: 2

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7. If $\int \frac{2\tan x + 3}{\sin^2 x + 2\cos^2 x} dx$
$= 1_n\left(1 + \sec^2 x\right) + p\tan^{-1}\left(\frac{\tan x}{q}\right) + c$,then pq is

A. 6

B. $3/2$

C. 3

D. None of these

Answer: 3

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8. If $f'\left(x^2-4x+3\right)>0$ for all $x\in(2,3)$then f(sinx) is increasing on

A. $\bigcup_{n\varepsilon I} 2n\pi,(4n+1)\pi/2$

B. R

C. $\bigcup_{n\varepsilon I}(4n-1)\pi/2,2n\pi$

D. None of theese

Answer: 3

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9. If f(x) is continuous and increasing functin such that the domain of $g(x) = \sqrt{f(x) - x}$ be R and $h(x) = \frac{1}{1-x}$ then the domain of $\phi(x) = \sqrt{f(f(f(x))) - h(h(h(x)))}$ is -

A. R

B. {0,1}

C. R-{0,1}

D. $R^+ - \{1\}$

Answer: 3

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10. If

$$f(x) = \begin{cases} \alpha + \frac{\sin[x]}{x}, & x > 0 \\ 2, & x = 0 \\ \beta + \left[\frac{\sin x - x}{x^3}\right], & x < 0 \end{cases}$$

(whlenotes the greatest integer function) if $f(x)$ is continuous at $x = 0$. then β is equal to

A. $\alpha - 1$

B. $\alpha + 1$

C. $\alpha + 2$

D. $\alpha - 2$

Answer: 2

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11. Find the greatest value of the term independent of x in the expansion of $\left(x \sin \alpha + \frac{\cos \alpha}{x}\right)^{10}$, where $\alpha \in R$.

A. 2^5

B. $\frac{10!}{(5!)^2}$

C. $\frac{1}{2^5} \frac{10!}{(5!)^2}$

D. None of these

Answer: 3

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12. The polynomial $f(x) = x^4 + ax^3 + bx^3 + cx + d$ has real coefficients and $f(2i) = f(2 + i) = 0$. Find the value of $(a + b + c + d)$.

A. 1

B. 4

C. 9

D. 10

Answer: 3

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13. If $b^2 - ac < 0$ and $a > 0$ then the value of the determinant is

A. positive

B. negative

C. zero

D. $b^2 + ae$

Answer: 2

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14. The probability that $\sin^{-1}(\sin x) + \cos^{-1}(\cos y)$ is an integer $x, y \in (1, 2, 3, 4)$,is

A. $\frac{1}{16}$

B. $\frac{3}{16}$

C. $\frac{15}{16}$

D. None of these

Answer: 2

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15. If the points $P(\alpha, 0)$ and $Q(0, \beta)$ always lies inside sthe Delta formed by the lines $2x - 3y - 6 = 0, 3x - y + 3 = 0$ and $3x + 4y - 12 = 0$ then

A. $\alpha \varepsilon [-1, 2], \beta \varepsilon [-2, 3]$

B. $\alpha \varepsilon [-1, 3], \beta \varepsilon [-2, 4]$

C. $\alpha \varepsilon [-2, 4], \beta \varepsilon [-3, 4]$

D. $\alpha \varepsilon [-1, 3], \beta \varepsilon [-2, 3]$

Answer: D

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16. The equation of the hyperbola whose foci are (6.5), (-4,5) and eccentricity 5/4 is

A. $\frac{(x-1)^2}{16} - \frac{(y-5)^2}{9} = 1$

B. $\frac{(x)^2}{16} - \frac{(y)^2}{9} = 1$

C. $\frac{(x-1)^2}{16} + \frac{(y-5)^2}{9} = 1$

D. None of these

Answer: 1

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17. The value of the definite integral $\int_0^{3\pi/4} (1+x)\sin x + (1-x)\cos x \Big) dx$ is

A. $2\tan\left(\frac{3\pi}{8}\right)$

B. $2\frac{\tan(\pi)}{4}$

C. $2\frac{\tan(\pi)}{8}$

D. 0

Answer: 1

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18. The value of the constant 'm' and 'c' for which y = mx + c is a solution of the differential equation D^2y - 3Dy -4y = -4x is:

A. is $m = -1, c = 3/4$

B. is $m = 1, c = -3/4$

C. no such real m,c

D. is$m = 1, c = 3/4$

Answer: 3

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19. Through the centriod of an equilateral triangle a line parallel to the base is drawn. On this line, an arbitary point P is taken inside the triangle. Let h denote the distahce of P from the base of the triangle. Let h_1 and h_2 be the distance of P from the other two sides of the triangle, then

A. h is the H.M of h_1, h_2

B. h is the G.M of h_1, h_2

C. h is the A.M of h_1, h_2

D. None of these

Answer: 3

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20. If the number of ways of selecting 3 numbers out of $1, 2, 3, \ldots\ldots, 2n+1$ such that they are in arithmetic progression in

441, then they are in arithemtric progression is 441, then the sum of the divisors of n is equal to

A. 21

B. 22

C. 32

D. None of these

Answer: 3

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21. If α and β are the roots of the quadratic equation $ax^2 + bx + c = 0$, then

$$\lim_{x \to \frac{1}{\alpha}} \sqrt{1 - \frac{\cos ec^2 + bx + a}{2(1 - \alpha x)^2}} =$$

A. $\left| \frac{c}{2\alpha} \left(\frac{1}{\alpha} - \frac{1}{\beta} \right) \right|$

B. $\left|\frac{c}{2\beta}\left(\frac{1}{\alpha}-\frac{1}{\beta}\right)\right|$

C. $\left|\frac{c}{2\beta}\left(\frac{1}{\alpha}-\frac{1}{\beta}\right)\right|$

D. None of these

Answer: 1

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22. If $\log_2(5.2^x+1), \log_4\left(2^{1-x}+1\right)$ and 1 are in A.P,then x equals

A. $\log^5$

B. $1-\log^5$

C. $\log_5 2$

D. None of these

Answer: 2

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23. The matrix $A = \begin{bmatrix} \frac{1}{\sqrt{2}} & \frac{1}{\sqrt{2}} \\ \frac{-1}{\sqrt{2}} & \frac{-1}{\sqrt{2}} \end{bmatrix}$ is

A. idempotent

B. orthogonal

C. nilpotent

D. involutory

Answer: 3

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24. In ΔABC with usual notation $\frac{r_1}{bc} + \frac{r_2}{ca} + \frac{r_3}{ab}$ is

A. $\frac{1}{2R} - \frac{1}{r}$

B. $2R - r$

C. $r - 2R$

D. $\frac{1}{r} - \frac{1}{2R}$

Answer: 4

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25. If $\overline{OA} = \hat{i} + 3\hat{J} - 2\widehat{K}$, then $\overline{OC}$ which bisects the angle AOB is given by:

A. $\hat{i} - \hat{J} - \widehat{K}$

B. $\hat{i} + \hat{J} + \widehat{K}$

C. $\widehat{-i} + \hat{J} - \widehat{K}$

D. $\hat{i} + \hat{J} - \widehat{K}$

Answer: 4

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26. The tangent to the curve $y = e^x$ drawn at the point (c, e^c) intersects the line joining $\left(c-1, e^{c-1}\right)$ and $\left(c+1, e^{c+1}\right)$ (a) on the left of $n = c$ (b) on the right of $n = c$ (c) at no points (d) at all points

A. on the left of x= c

B. on the right of x=c

C. at no point

D. at all points

Answer: 1

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27. The system of equation `|z+2-2i|=4 and |z|=1 has -

A. Two solutions

B. No solution

C. Infinite solutions

D. One solution

Answer: 2

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28. The sides of a triangle ABC lie on the lines $3x + 4y = 0, 4x + 3y = 0$ and $x = 3$. Let (h, k) be the centre of the circle inscribed in $\triangle ABC$. The value of $(h + k)$ equals

A. 0

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

C. $-\frac{1}{4}$

D. $\frac{1}{2}$

Answer: 1

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29. $y = f(x)$ is a function which satisfies $f(0) = 0, f''(x) = f'(x)$ and $f'(0) = 1$ then the area bounded by the graph of $y = f(x)$, the lines $x = 0, x - 1 = 0$ and $y + 1 = 0$ is

A. e

B. e-2

C. e-1

D. e+1

Answer: 3

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30. The function $f(x) = \alpha x^2 - \beta(x) - 4x^3 + (\gamma)$ where alpha,beta,gamma epsilon "R has local minima at"

$P(\log_2)a$, $f(\log_2 a)$ "& local maxima at"

$Q\left(\log_2 a^2\right), f\left(\log_2 a^2\right)$."If the graph of" f(x) "changes concavity about the point" $R\frac{3}{4}, \frac{f(3)}{4}$ "then which of the following conic section can have eccentricity" 'a'-

A. circle

B. parabola

C. ellipse

D. hyperbola

Answer: 4

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