



MATHS

BOOKS - CAREER POINT

MOCK TEST 3

Maths

1. Least value of the function $f(x) = e^{\sin x - 2 \sin^2 x}$

is

A. $\frac{1}{\sqrt[3]{e}}$

B. $\frac{1}{e^6}$

C. e^3

D. $\frac{1}{e^3}$

Answer: 4



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2. If $f(x) = x^5 - 20x^3 + 240x$, then $f(x)$ satisfies which of the following

- A. It is decreasing everywhere
- B. It is decreasing only in $(0, \infty)$
- C. It is increasing everywhere
- D. It is increasing only in $(-\infty, 0)$

Answer: 3



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3. Equation of the tangent to the curve $y = e^{-|x|}$ at the point where it cuts the line $x=1$ -

A. is $ey+x=2$

B. is $x+y=e$

C. is $ex+y=1$

D. does not exist

Answer: 1



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4. If R be a relation from set A to B defined by $xRy \Rightarrow (x-y)$ is positive than R is. If $A=\{4,3\}, B=\{2,3,4\}$

A. $R = \{(4, 2), (4, 3), (3, 2)\}$

B. $R = \{(4, 3), (3, 4)\}$

C. $R = \{(2, 3), (2, 5)\}$

D. $R = \phi$

Answer: 1



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5. If z satisfies $|z - 1| + |z + 1| = 2$, then locus of z is

A. A straight line passing through $z=1$ & $z=-1$

B. Circle

C. A line segment

D. Ellipse

Answer: 1



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6. If the extremities of a line segment of length l moves in two fixed perpendicular straight

lines, then the locus of the point which divides this line segment in the ratio 1 : 2 is-

- A. a parabola
- B. an ellipse
- C. a hyperbola
- D. None of these

Answer: 2



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7. P is a variable points on the hyperbola

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1 \text{ whose vertex is } A(a, 0) \text{ The}$$

locus of the middle points AP is

A. $\frac{(2x - a)^2}{a^2} - \frac{2y^2}{b^2} = 1$

B. $\frac{(2x - a)^2}{a^2} - \frac{4y^2}{b^2} = 1$

C. $\frac{(2x - a)^2}{a^2} - \frac{8y^2}{b^2} = 1$

D. None of these

Answer: 2



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8. If $\int f(x)dx = g(x)$, then $\int x^{11} f(x^6) dx$ is equal to

A. $\frac{1}{6} \left[x^6 g(x^6) - \int x^5 g(x^6) \right] + C$

B. $\frac{1}{6} x^6 g(x^6) - \int x^5 g(x^6) dx + C$

C. $\frac{1}{6} \left[x^6 g(x^6) - 5 \int x^5 g(x^6) dx \right] + C$

D. None of these

Answer: 2



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9. $\int_1^e \left\{ \frac{(\log x - 1)}{1 + (\log x)^2} \right\}^2 dx$ is equal to

A. $\frac{e}{2}$

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

C. $\frac{e - 2}{2}$

D. None of these

Answer: 3



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10. If the value of the determinants $\begin{vmatrix} a & 1 & 1 \\ 1 & b & 1 \\ 1 & 1 & c \end{vmatrix}$

is positive then:

A. $abc > 1$

B. $abc > -8$

C. $abc > -8$

D. $abc > -2$

Answer: 2



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11. If A is 3×4 matrix and B is a matrix such that $A^T B$ and BA^T are both defined. Then, B is of the type (a) 3×4 (b) 3×3 (c) 4×4 (d) 4×3

A. 3×4

B. 3×3

C. 4×4

D. 4×3

Answer: 1



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12. In the expansion of $\left(3\sqrt{4} + \frac{1}{4\sqrt{6}}\right)^{20}$

A. (i),(iii)

B. (ii),(iii)

C. (i),(ii)

D. All three

Answer: 2



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13. The number of times the digit 5 will be written when listing the integers from 1 to 100, is

A. 271

B. 272

C. 300

D. None of these

Answer: 3



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14. Salt $A + S \rightarrow B \xrightarrow{BaCl_2}$ White precipitate A is paramagnetic in nature and contains about 55% K. Thus, A is

A. 9

B. 12

C. 27

D. 81

Answer: 3



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15. Find the image of the line

$$\frac{x - 1}{2} = \frac{y + 1}{-1} = \frac{z - 3}{4} \quad \text{in the plane}$$

$$3x - 3y + 10z - 26 = 0.$$

A. $\frac{x - 5/2}{9} = \frac{y - 1/2}{-1} = \frac{z - 2}{-3}$

B. $\frac{x + 5/2}{9} = \frac{y + 1/2}{-1} = \frac{z + 2}{-3}$

C. $\frac{x - 5/2}{9} = \frac{y + 1/2}{-1} = \frac{z + 2}{-3}$

D. None of these

Answer: 1



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16. The intercept made by the plane $\vec{r} \cdot \vec{n} = q$

on the x-axis is a. $\frac{q}{\hat{i} \cdot \vec{n}}$ b. $\frac{\hat{i} \cdot \vec{n}}{q}$ c. $\frac{\hat{i} \cdot \vec{n}}{q}$ d. $\frac{q}{|\vec{n}|}$

A. $\frac{q}{\hat{i} \cdot \vec{n}}$

B. $\frac{\hat{i} \cdot \vec{n}}{q}$

C. $\frac{q}{|\vec{n}|}$

D. None of these

Answer: 1



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17.

if

$A(\cos \alpha, \sin \alpha), B(\sin \alpha, -\cos \alpha), C(1, 2)$

are the vertices of ABC , then as α varies,

find the locus of its centroid.

A. $x^2 + y^2 - 2x - 4y + 1 = 0$

B. $x^2 + y^2 - 2x - 4y + 3 = 0$

C. $3(x^2 + y^2) - 2x - 4y + 1 = 0$

D. None

Answer: 3



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18. A line passes through $(2, 2)$ and cuts a triangle of area 9 square units from the and cuts a triangle of area 9 square units from the first quadrant. The sum of all possible values for the slope of such a line, is-

A. $-\frac{5}{2}$

B. -2

C. $-\frac{3}{2}$

D. -1

Answer: 1



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19. $(-64)^{1/4}$ is equal to-

A. $\pm 2(1 + i)$

B. $\pm 2(1 - i)$

C. $\pm 2(1 \pm i)$

D. None of these

Answer: 3



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20. Solution of the equation

$$x dy = \left(y + \frac{x f(y/x)}{f'(y/x)} \right) dx \text{ is-}$$

- A. $|f(y/x)| = c|x|, c \in R$
- B. $|f(y/x)| = |x| + c, c > 0$
- C. $|f(y/x)| = c|x|, c > 0$
- D. None of these

Answer: 3





21. Let $u(x)$ and $v(x)$ be differentiable functions

such that $\frac{u(x)}{v(x)}=7$. If $\frac{u'(x)}{v'(x)}=p$ and $\left(\frac{u(x)}{v(x)}\right)'$

$=q$

A. 1

B. 0

C. 7

D. 3

Answer: 1



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22. If a line passing through the origin touches the circle $(x - 4)^2 + (y + 5)^2 = 25$, then find its slope.

A. $\pm 3/4$

B. 0

C. ± 3

D. ± 1

Answer: 2



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23. If the line $x + y = a$ touches the parabola $y = x - x^2$, then find the value of a .

A. 0

B. 1

C. -1

D. None of these

Answer: 2



24. In an A.P the sum of the first n terms bears a constant ratio λ with the sum of the next n terms then $\lambda =$

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

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

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

D. $\frac{2}{5}$

Answer: 2





25. If $f(x) = x^2 + 2bx + 2c^2,$

$g(x) = -x^2 - 2cx + b^2$ and

$\min f(x) > \max g(x)$ then

A. $|b| < 2|c|$

B. $|c| < 2|b|$

C. $|c| > \sqrt{2}|b|$

D. $|b| > \sqrt{2}|c|$

Answer: 3



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26. A person goes to office either by car, scooter, bus or train probability of which being $\frac{1}{7}$, $\frac{3}{7}$, $\frac{2}{7}$ and $\frac{1}{7}$ respectively.

Probability that he reaches office late, if he takes car, scooter, bus or train is $\frac{2}{9}$, $\frac{1}{9}$, $\frac{4}{9}$ and $\frac{1}{9}$ respectively. Given that he reached office in time, then what is the probability that he travelled by a car?

A. $\frac{1}{5}$

B. $\frac{1}{7}$

C. $\frac{6}{7}$

D. None of these

Answer: 2



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27. The curve passing through the point (0,1)

and satisfying the equation $\sin\left(\frac{dy}{dx}\right) = a$, is-

A. $\cos\left(\frac{y+1}{x}\right) = a$

$$\text{B. } \cos\left(\frac{x}{y+1}\right) = a$$

$$\text{C. } \sin\left(\frac{y-1}{x}\right) = a$$

$$\text{D. } \sin\left(\frac{x}{y-1}\right) = a$$

Answer: 3



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28. If the equation

$\cos^4 x - 2 \cos^2 x + a^2 = 0$ has at least one

solution, then the sum of all possible integral

values of a is equal to a. 4 b. 3 c. 2 d. 0

A. 4

B. 3

C. 2

D. 0

Answer: 4



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29. The standard deviation of 25 numbers is 40. If each of the numbers is increased by 5, then the new standard deviation will be -

A. 40

B. 45

C. $40 + \frac{21}{25}$

D. None of these

Answer: 1



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30. Circumradius of a $\triangle ABC$ is 2, O is the circumcentre, H is the orthocentre then-

$$\frac{1}{64} (AH^2 + BC^2) (BH^2 + AC^2) (CH^2 + AB^2)$$

is equal to

A. 64

B. 16

C. $\frac{1}{64}$

D. 1

Answer: 1



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