MATHS

BOOKS - TARGET MATHS (HINGLISH)

MODEL QUESTION PAPER-II

Mcqs

1. Find the direction cosines of the vector $2\hat{i} + 2\hat{j} - \hat{k}$

A. $\frac{2}{3}, \frac{1}{3}, \frac{1}{3}$

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

C. $\frac{1}{3}, \frac{-2}{3}, \frac{2}{3}$

D. $\frac{2}{3}, \frac{2}{3}, \frac{-1}{3}$

Answer: D

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2. A circle $x^2 + y^2 + 2gx + 2fy + c = 0$ passing through $(4, -2)$ is concentric to the circle $x^2 + y^2 - 2x + 4y + 20 = 0$, then the value of c will be

A. -4

B. 4

C. 0

D. 1

Answer: A

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3. In a ΔABC , if a b and c are in AP ,then the value of $\frac{\sin\frac{A}{2}\sin\frac{C}{2}}{\sin\frac{B}{2}}$ is

A. 1

B. 2

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

D. -1

Answer: C

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4. The expression $\frac{\cos(10\pi)}{13} + \frac{\cos(8\pi)}{13} + \frac{\cos(3\pi)}{13} + \frac{\cos(5\pi)}{13}$ is equal to

A. -1

B. 0

C. 1

D. None of these

Answer: B

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5. If the equation $kxy + 10x + 6y + 4 = 0$ represents a pair of lines then : $k =$

A. 10

B. 15

C. -5

D. -10

Answer: B

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6. What are the points on the x-axis whose perpendicular distance from the line $\frac{x}{a}+\frac{y}{b}=1$ is a

A. $\left[\frac{a}{b}\left(b \pm \sqrt{a^2+b^2}\right), 0\right]$

B. $\left[\frac{b}{a}\left(b \pm \sqrt{a^2+b^2}\right), 0\right]$

C. $\left[\frac{a}{b}\left(a \pm \sqrt{a^2+b^2}\right), 0\right]$

D. None of these

Answer: A

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7. The value of $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} \log(\sec\theta - \tan\theta)d\theta$ is

A. 0

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

C. π

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

Answer: A

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8. Let X= $\begin{bmatrix} x \\ y \\ z \end{bmatrix}$,D= $\begin{bmatrix} 3 \\ 5 \\ 11 \end{bmatrix}$ and $A = \begin{bmatrix} 1 & -1 & -2 \\ 2 & 1 & 1 \\ 4 & -1 & -2 \end{bmatrix}$, if $X = A^{-1}D$, then X is equal to

A. $\begin{bmatrix} 1 \\ 0 \\ 2 \end{bmatrix}$

B. $\begin{bmatrix} \frac{8}{3} \\ \frac{-1}{3} \\ 0 \end{bmatrix}$

C. $\begin{bmatrix} \frac{-8}{3} \\ 1 \\ 0 \end{bmatrix}$

D. $\begin{bmatrix} \frac{8}{3} \\ \frac{1}{3} \\ -1 \end{bmatrix}$

Answer: B

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9. IF $y = \tan^{-1}\left(\frac{\sqrt{x} - x}{(1+x)^{\frac{3}{2}}}\right)$ then y'(1) is

A. 0

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

C. -1

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

Answer: D

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10. Which of the following is not true always ?

A. IF f(x) is not continuous at x=a, then it is not differentiable at x=a

B. IF f(x) is continuous at x=a, then it is differentiable at x=a

C. If f(x) and g(x) are differentiable at x=a, then f(x) +g(x) is also differentiable at x=a.

D. If f(x) is continuous at x=a, then $\lim_{x \to a} f(x)$ exists.

Answer: B

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11. If $y = \tan^{-1} \sqrt{x^Y(2) + y^2} + \cot^{-1} \sqrt{x^2 + y^2}$, then $\frac{dy}{dx} =$

A. 0

B. 1

C. 2

D. -1

Answer: A

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12. A square non-singular matrix A satisfies $A^2 - A + 2I = 0, \quad \text{then} \quad A^{-1}$=

A. I-A

B. $\frac{1}{2}(I - A)$

C. $\frac{1}{2}(I + A)$

D. I+A

Answer: B

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13. $\int \frac{(x+1)(x+\log x)^2}{x} dx =$

A. $\frac{1}{3}(x+\log x)+c$

B. $\frac{1}{3}(x+\log x)^2+c$

C. $\frac{1}{3}(x+\log x)^3+c$

D. $(x+\log x)^2+c$

Answer: C

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14. Two functions $f: R \to R$and $g: R \to R$ are defined as follows:

$$f(x) = \begin{cases} 0 & (x\text{rational}) \\ 1 & (x\text{irrational}) \end{cases}$$

$$g(x) = \begin{cases} -1 & (x\text{rational}) \\ 0 & (x\text{irrational}) \end{cases}$$

then (gof)(e)+(fog) (π) =

A. -1

B. 0

C. 1

D. 2

Answer: A

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15. In an entrance examinations there are multiple choice question. There are five possible answers to each question of which one is correct. The probability that a student knows the answer to a question is 80%. IF he gets the correct answer to the question, then the probability that he was guessing is

A. $\frac{1}{9}$

B. $\frac{1}{10}$

C. $\frac{1}{21}$

D. $\frac{1}{20}$

Answer: C

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16. Find the approximate values of :

$\cot^{-1}(1.001)$

A. $\frac{\pi}{5} + 0.0005$

B. $\frac{\pi}{4} + 0.03$

C. $\frac{\pi}{4} - 0.0005$

D. $\frac{\pi}{4} - 0.003$

Answer: C

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17. $\int e^x \left(1 - \cot x + \cot^2 x\right) dx =$

A. $e^x \cot x + c$

B. $e^x \cos ecx + c$

C. $-e^x \cot x + c$

D. $-e^x \cos ecx + c$

Answer: C

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18. The differential equation of all circles which passes through the origin and whose centers lie on Y-axis is

A. $\left(x^2 - y^2\right)\frac{dy}{dx} - 2xy = 0$

B. $\left(x^2 - y^2\right)\frac{dy}{dx} + 2xy = 0$

C. $\left(x^2 - y^2\right)\frac{dy}{dx} - xy = 0$

D. $\left(x^2 - y^2\right)\frac{dy}{dx} + xy = 0$

Answer: A

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19. X is continuous random variable with probability density function $f(x) = \frac{x^2}{8}, 0 \leq x \leq 1$. Then, the value of $P(0.2 \leq X \leq 0.5)$ is

A. $\frac{0.117}{24}$

B. $\frac{0.112}{24}$

C. $\frac{0.113}{36}$

D. $\frac{0.112}{36}$

Answer: A

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20. IF $x = 2at^2, y = at^4$, then $\frac{d^2y}{dx^2}$ at t=2 is

A. 4

B. 2a

C. $\frac{1}{2a}$

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

Answer: C

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21. If the function $f(x) = \frac{\left(e^{kx} - 1\right)\tan kx}{4x^2}, x \neq 0$

$= 16 \qquad x = 0$

is continuous at x=0, then k= . . .

A. 2

B. -2

C. ± 2

D. 3

Answer: C

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22. General solution of $\tan\theta + \tan\left(\frac{\pi}{2} - \theta\right) = 2$ is

A. $n\pi \pm \frac{\pi}{4}$

B. $n\pi + \frac{\pi}{4}$

C. $2n\pi \pm \frac{\pi}{4}$

D. $n\pi + (-1)^n \frac{\pi}{4}$

Answer: B

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23. The sum of odd integeres from 1 to 3001 is

A. 1501^2

B. 1500^2

C. 1502^2

D. 1503^3

Answer: A

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24. The tangent to the curve $y = e^{2x}$ at the point (0,1) meets X-axis at

A. (0,a)

B. (2,0)

C. $(-\frac{1}{2}, 0)$

D. (-2,0)

Answer: C

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25. Let the p.m.f. of a random variable X be -

$$P(x) = \frac{3-x}{10} \quad \text{for} \quad x = -1, 0, 1, 2$$

= 0 otherwise

Then E(X) is ..... .

A. 0

B. 1

C. 2

D. 3

Answer: A

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26. The function f(x)=$[x(x-2)]^2$ is increasing in the set

A. $(-\infty, 0) \cup (2, \infty)$

B. $(-\infty, 1)$

C. $(0, 1) \cup (2, \infty)$

D. (1,2)

Answer: C

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27. If $A(2, 3, -4), B(m, 1, -1), C(3, 2, 2)$ and $G(3, 2, n)$ is the centroid of ΔABC, then the values of m and n respectively are

A. $-4, 1$

B. 3,4

C. 4,3

D. $4, -1$

Answer: D

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28. The maximum value of $\frac{\log x}{x}$ d is

A. e

B. 1

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

D. 2e

Answer: C

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29. In a binomial distribution the probability of getting a success is $\frac{1}{4}$ and standard deviation is 3, then its mean is

A. 6

B. 8

C. 12

D. 10

Answer: C

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30. IF $\sin\theta = \frac{1}{2}\left(a + \frac{1}{a}\right)$ then the value of sin 30 is

A. $\frac{1}{8}\left(a^3+\frac{1}{a^3}\right)$

B. $\frac{3}{2}\left(a+\frac{1}{a}\right)$

C. $-\frac{1}{2}\left(a^3+\frac{1}{a^3}\right)$

D. $\frac{1}{3}\left(a^3+\frac{1}{a^3}\right)$

Answer: C

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31. The vector parallel to the line of intersection of the planes $\vec{r}.\left(3\hat{i}-\hat{j}+\hat{k}\right)=1$ and $\vec{r}.\left(\hat{i}+4\hat{j}-2\hat{k}\right)=2$ is :

A. $-2\hat{i}-7\hat{j}+3\hat{k}$

B. $2\hat{i} + 7\hat{j} - 3\hat{k}$

C. $2\hat{i} + 7\hat{j} + 3\hat{k}$

D. $-2\hat{i} + 7\hat{j} + 3\hat{k}$

Answer: D

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32. IF $\int_e^1 \tan^{-1} x dx = p$,then $\int_e^1 \tan^{-1}\left(\frac{1-x}{1+x}\right)dx =$

A. $\frac{1-p}{1+p}$

B. 1-p

C. $\frac{\pi}{4} - p$

D. $\frac{\pi}{4} + p$

Answer: C

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33. IF the equation of the ellipse is $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ thenSP+S'P=

A. a

B. 2a

C. 2b

D. b

Answer: B

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34. The length of the perpendicular from P(1,6,3) to the line $\frac{x}{1} = \frac{y-1}{2} = \frac{z-2}{3} is$

A. 3

B. $\sqrt{11}$

C. $\sqrt{13}$

D. 5

Answer: C

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35. IF the line $\frac{x-1}{2}=\frac{y+1}{3}=\frac{z}{4}$ and origin lie on the plane 4x+4y-kz=0, then k=

A. 1

B. 3

C. 5

D. 7

Answer: C

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36. Minimum value of Z=5x+8y subject to $x, y \geq 0, x \leq 4y \geq 2$and $x + y \geq 5$ is

A. 36

B. 31

C. 40

D. 45

Answer: B

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37. In ΔABC, if the sides are a=3, b=5 and c=4, then $\sin \frac{B}{2} + \cos \frac{B}{2}$ is equal to

A. 1

B. $\frac{\sqrt{3}-1}{2}$

C. $\sqrt{2}$

D. $\frac{\sqrt{3}+1}{2}$

Answer: C

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38. Solution of the differential equation $\sin^{-1}\left(\frac{dy}{dx}\right) = x + y$ is

A. $\tan(x+y) + \sec(x+y) = x + c$

B. $\tan(x+y) - \sec(x+y) = x + c$

C. $\tan(x+y)+\sec(x+y)+x=c$

D. $\tan(x+y)-\sec(x+y)+x=c$

Answer: B

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39. Find the distance of the point (2,3,4) from the plane $\vec{r}.\left(3\hat{i}-6\hat{j}+2\hat{k}\right)+11=0.$

A. 9

B. 10

C. 2

D. 1

Answer: D

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40. The angle between lines represented by the equation $11x^2 - 24xy + 4y^2 = 0$ are

A. $\tan^{-1}\left(\frac{-3}{4}\right)$

B. $\tan^{-1}\left(\frac{3}{4}\right)$

C. $\tan^{-1}\left(\frac{4}{3}\right)$

D. $\tan^{-1}\left(\frac{2}{3}\right)$

Answer: C

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41. IF $\tan^{-1} 2x + \tan^{-1} 3x = \frac{\pi}{4}$, then x=

A. -1

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

C. $-1, \frac{1}{6}$

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

Answer: B

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42. The joint equation of pair of lines having slopes 1 and 3 and passing throught the origin is

A. $4x^2 - 3xy - y^2 = 0$

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

C. $3x^2 - 4xy - y^2 = 0$

D. $3x^2 = y^2$

Answer: B

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43. IF tanA+cotA=5, then $\tan^4 A + \cot^4 A$ is equal

A. 520

B. 521

C. 529

D. 527

Answer: D

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44. Three numbers whose sum is 15 are in A.P. If they are added by 1,4 and 19 respectively, they are in GP. Thenumbers are

A. 2,5,8

B. 26,5,-16

C. 2,5,8 and 26,5,-16

D. None of these

Answer: C

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45. The area of the region bounded by the lines $y = mx$, $x = 1$, $x = 2$ and X-axis is 6 sq units, then m is equal to

A. 3

B. 1

C. 2

D. 4

Answer: D

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46. $\int_{-1}^{1} \sin^3 x \cos^2 x dx =$

A. 0

B. 1

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

D. 2

Answer: A

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47. The area enclosed between the curves $y = x$ and $y = 2x - x^2$ (in square units), is

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

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

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

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

Answer: B

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48. The solution of $\frac{dy}{dx} - y = e^x, y(0) = 1$, is

A. $y = (x-1)e^x$

B. $y = (x+1)e^x$

C. $y = (2x-1)e^x$

D. $y = (1 - 2x)e^x$

Answer: B

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49. For any three vectors $\bar{a}, \bar{b}$ and $\bar{c}$, $(\bar{a} - \bar{b}).\left[(\bar{b} + \bar{c}) \times (\bar{c} + \bar{a})\right]$ is equal to :

A. $\bar{2}a.\left(\bar{b} \times \bar{e}\right)$

B. $\left[\bar{a}\bar{b}\bar{c}\right]$

C. $\left[\bar{a}\bar{b}\bar{c}\right]^2$

D. 0

Answer: D

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