MATHS

BOOKS - TARGET MATHS (HINGLISH)

MODEL QUESTION PAPER-I

Mcqs

1. The equation $3x^2 + 2hxy + 3y^2 = 0$ represents a pair of straight lines passing through the origin . The two lines are

A. real and distinct if $h^2 > 3$

B. real and distinct if $h^2 > 9$

C. real and coincident if $h^2 > 12$

D. real and coincident if $h^2 > 3$

Answer: A

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2. $\int \frac{e^{5\log x} - e^{4\log x}}{e^{3\log x} - e^{2\log x}} dx$

A. $e.3^{-3x} + c$

B. $e^3 \log x + c$

C. $\frac{x^3}{3} + c$

D. $\frac{x^4}{4} + c$

Answer: C

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3. $\cos 20^\circ . \cos 40^\circ . \cos 60^\circ \cos 80^\circ =$

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

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

C. $\frac{\sqrt{3}}{16}$

D. $\frac{\sqrt{3}}{32}$

Answer: A

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4. Find the equations of the diagonals of the square formed by the lines $x = o, y = 0, x = 1 and y = 1.$

A. y=x,y+x=1

B. y=x,x+y=2

C. 2y=x, $y + x = \frac{1}{3}$

D. y=2x,y+2x=1

Answer: A

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5. The combined equations of the pair of lines through the origin such that one is parallel to x+5y=5 and the other is

perpendicular to x-5y+15=0 is

A. $x^2 + 25xy + y^2 = 0$

B. $5x^2 - 36xy + 5y^2 = 0$

C. $x^2 - 25y^2 = 0$

D. $5x^2 + 26xy + 5y^2 = 0$

Answer: D

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6. If f(x) $= \frac{x^2-4x+3}{x^2-1}, \quad \ldots x \neq 1$
$= 2, \quad \ldots x = 1$ then :

A. $\lim_{x \to l} f(x) = 2$

B. f(x) is continuous at x=1.

C. f(x) is discontinuous at x=1.

D. $\lim_{x \to l} f(x) = 2$ does not exists.

Answer: C

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7. The equation of the hyperbola whose foci are (-2, 0) and (2,0) and eccentricity is 2 is given by

A. $x^3 - 3y^2 = 3$

B. $3x^2 - y^2 = 3$

C. $-x^2 + 3y^2 = 3$

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

Answer: B

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8. The statement $\sim(p \leftrightarrow \sim q)$ is

A. a tautology

B. a contradiction

C. equivalent to $p \leftrightarrow q$

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

Answer: C

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9. The relation R defined in N as $aRb \Rightarrow b$ is divisible by a is

A. Reflexive but not symmetric

B. Symmetric but not transitive

C. Symmetric and transitive

D. None of these

Answer: A

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10. If Ram secures 100 marks in maths, then he will get a mobile. The converse is

A. IF Ram gets a mobile, then he Will not secure 100 marks

B. If Ram does not get a mobile, then he will secure 100 marks.

C. IF Ram will get a mobile, then he secures 100 marks in maths.

D. If Ram does not get a mobile, then he will not score 100 marks.

Answer: C

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11. Find the general solution of each of the following differential equations:

$\cos x(1+\cos y)dx - \sin y(1+\sin x)dy = 0$

A. $(1-\sin x)(1+\cos y) = c$

B. $(1+\sin x)(1-\cos y) = c$

C. $(1+\sin x)(1+\cos y) = c$

D. $(1-\sin x)(1-\cos y) = c$

Answer: C

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12. The value of c in (0,2) satisfying the Mean Value theorem for the function $f(x) = x(x-1)^2, x\varepsilon[0,2]$ is equal to

A. $\frac{3}{4}$

B. $\frac{4}{3}$

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

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

Answer: B

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13. If $\phi(x) = \log_5(\log_3 x)$,then $\phi'(e) =$

A. 1

B. $\frac{1}{e}\log_5 e$

C. $\log_5 e$

D. $e \log_e 5$

Answer: B

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14. $\int_0^2 \sqrt{\frac{2+x}{2-x}}dx =$

A. $\pi + 2$

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

C. $\pi + 1$

D. $\pi - 1$

Answer: A

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15. The matrix $\begin{bmatrix} \lambda & 1 & 0 \\ 0 & 2 & 3 \\ 0 & 0 & \lambda \end{bmatrix}$ is invertible.

A. For all real values of λ

B. only when $\lambda = \pm \frac{1}{\sqrt{2}}$

C. Only when $\lambda \neq 0$

D. only when $\lambda = 0$

Answer: C

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16. The angle between the line $2\hat{i} + 3\hat{j} + 4\hat{k}$ and the plane $\bar{r}.\left(3\hat{i} + 2\hat{j} + 3\hat{k}\right) = 4$ is

A. 45°

B. 0°

C. $\cos^{-1}\left(\frac{24}{\sqrt{29}\sqrt{22}}\right)$

D. 90°

Answer: B

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17. If normal the curve y=f(x) is parallel to X-axis, then correct statement is

A. $\frac{dx}{dy} = 0$

B. $\frac{dy}{dx} = 0$

C. $\frac{dx}{dy} = 1$

D. $\frac{dy}{dx} = 1$

Answer: A

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18. The position vectors of the point A, B, C and D are $3\hat{i} - 2\hat{j} - \hat{k}, 2\hat{i} + 3\hat{j} - 4\hat{k}, -\hat{i} + \hat{j} + 2\hat{k}$ and $4\hat{i} + 5\hat{j} + \lambda\hat{k}$

, respectively. If the points A, B, C and D lie on a plane, find the value of λ.

A. $-\frac{146}{17}$

B. $\frac{146}{17}$

C. $-\frac{17}{146}$

D. $\frac{17}{146}$

Answer: A

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19. IF a coin is tossed twice and X is the number of tails, then E(X)=

A. 0

B. 1

C. 2

D. 3

Answer: B

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20. If $t_n = \frac{1}{4}(n+2)(n+3)$ for $n = 1, 2, 3, \ldots$ then $\frac{1}{t_1} + \frac{1}{t_2} + \frac{1}{t_3} + \ldots + \frac{1}{t_{2003}} =$

A. $\frac{4006}{3006}$

B. $\frac{4003}{3007}$

C. $\frac{4006}{3008}$

D. $\frac{4006}{3009}$

Answer: D

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21. The rate of change of surface area of a sphere of radius r when the radius is increasing at the rate of 2 cm/sec is proportional to

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

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

C. r

D. r^2

Answer: C

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22. If the position vectors of the points A, B, C are $\bar{a}, \bar{b}$ and $3\bar{a} - 2\bar{b}$ respectively, then the position A, B, C are

A. Collinear

B. Non-collinear

C. Forming a right angled traingle

D. None of these

Answer: A

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23. $\int \frac{\sin^3 2x}{\cos^5 2x} dx =$

A. $\tan^4 x + c$

B. $\tan 4x + c$

C. $\tan^4 2x + x + c$

D. $\frac{1}{8}\tan^4 2x + c$

Answer: D

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24. IF $A = \begin{bmatrix} x & 1 \\ 1 & 0 \end{bmatrix}$ and $A^2 = I$, then A^{-1} is equal to

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

B. $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 1 \\ 1 & 1 \end{bmatrix}$

D. $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$

Answer: A

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25. The order of the differential equation of the family of parabolas whose axis is the X-axis is

A. $\frac{d^2y}{dx^2} + \left(\frac{dy}{dx}\right)^2 = 0$

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

C. $y\left(\frac{d^2y}{dx^2}\right)+\left(\frac{dy}{dx}\right)^2=0$

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

Answer: C

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26. What are the direction cosines of the y-axis ?

A. (1,0,0)

B. (0,1,0)

C. (0,0,1)

D. (0,-1,0)

Answer: B

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27. IF $y = \cos^2\left(\frac{3x}{2}\right) - \sin^2\left(\frac{3x}{2}\right)$,then $\frac{d^2y}{dx^2}$ is

A. $-3\sqrt{1-y^2}$

B. 9y

C. $3\sqrt{1-y^2}$

D. $-9y$

Answer: D

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28. A fair coin is tossed n times. if the probability that head occurs 6 times is equal to the probability that head occurs 8 times, then find the value of n.

A. 15

B. 14

C. 12

D. 7

Answer: B

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29. The probability that at least one of the events $AandB$ occurs is 0.6. If $AandB$ occur simultaneously with probability 0.2, then find $P(A) + P(B)$.

A. 0.4

B. 0.8

C. 1.2

D. 1.4

Answer: C

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30. $\frac{\cos 9^\circ + \sin 9^\circ}{\cos 9^\circ - sim9^\circ} =$ (a) $\tan 54^\circ$ (b) $\tan 36^\circ$ (d) None of these (c) $\tan 18^\circ$

A. $\tan 54^\circ$

B. $\tan 36^\circ$

C. $\tan 18^\circ$

D. $\tan 9^\circ$

Answer: A

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31. $e^{-x}\frac{dy}{dx} = y\left(1 + \tan x + \tan^2 x\right)$

A. $\log y = e^x \tan x + c$

B. $\log x = e^y \tan y + c$

C. $\tan x = \log y + c$

D. $\tan x = \log y + c$

Answer: A

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32. $\int_0^{\pi/6} \frac{\sin x}{\cos^3 x} dx$ is equal to

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

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

C. 2

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

Answer: B

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33. Prove that the lines $\frac{x}{1} = \frac{y-2}{2} = \frac{z+3}{3}$ and $\frac{x-2}{2} = \frac{y-6}{3} = \frac{z-3}{4}$ are coplanar. Also find the equation of the plane containing these lines.

A. Parallel

B. perpendicular

C. coplanar

D. non-coplanar

Answer: C

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34. In a triangle ABC, if $a = 2x, b = 2y$ and $C = 120^\circ$, then the area of the triangle is-

A. xy

B. 2xy

C. $\sqrt{3}$xy

D. 3xy

Answer: C

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35. IF $\tan^{-1}(1+x)+\tan^{-1}(1-x)=\frac{\pi}{2}$, then the value of x is

A. 0

B. 1

C. -1

D. π

Answer: A

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36. IF $\tan.\, m\theta = \tan.\, n\theta$, then the general value of θ will be in

A. A.P.

B. G.P.

C. H.P.

D. None of these

Answer: A

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37. The minimum value of $\left(x^2+\frac{250}{x}\right)$ is

A. 75

B. 50

C. 25

D. 55

Answer: A

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38. Area bounded by the curve $f(x) = \cos x$ which is bounded by the lines $x = 0$ and $x = \pi$ is

A. 4sq.units

B. 1sq.units

C. 2sq.units

D. 3sq.units

Answer: C

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39. If $x = t^2$ and $y = t^3$, find $\frac{d^2y}{dx^2}$.

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

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

C. $\frac{3}{4t}$

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

Answer: C

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40. The area bounded by the parabola $y = 4x - x^2$ and X-axis is

A. $\frac{30}{7}$sq.units

B. $\frac{31}{7}$sq.units

C. $\frac{32}{3}$sq.units

D. $\frac{34}{3}$sq.units

Answer: C

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41. $y = a + \frac{b}{x}$ is a solution of the differential equation

A. $x^2\frac{d^2y}{dx^2} + \frac{2dy}{dx} = 0$

B. $x\frac{d^2y}{dx^2}+\frac{2dy}{dx}=0$

C. $x^2\frac{d^2y}{dx^2}-\frac{2dy}{dx}=0$

D. $x\frac{d^2y}{dx^2}-\frac{2dy}{dx}=0$

Answer: B

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42. The line $\frac{x-2}{3}=\frac{y-3}{4}=\frac{z-4}{0}$ is parallel to

A. XY-plane

B. YZ-plane

C. ZX-plane

D. X=3

Answer: A

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43. $\int_{-\pi/4}^{\pi/4} x^3 \sin^4 x dx =$

A. 0

B. 1

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

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

Answer: A

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44. If A is an obtause angle, then $\frac{\sin^3 A - \cos^3}{\sin A - \cos A} + \frac{\sin A}{\sqrt{a + \tan^2 A}} - 2\tan A \cot A.$ is always equal to

A. 1

B. -1

C. 2

D. -2

Answer: B

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45. $\int \frac{\log x}{x^3} dx =$

A. $\frac{1}{4x^2}(2\log x - 1) + c$

B. $-\frac{1}{4x^2}(2\log x + 1) + c$

C. $\frac{1}{4x^2}(2\log x + 1) + c$

D. $\frac{1}{4x^2}(2\log x - 1) + c$

Answer: B

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46. IF 5^{th} term of a H.P . Is $\frac{1}{45}$ and 11^{th} term is $\frac{1}{69}$, then its 16^{th} term will be

A. $\frac{1}{89}$

B. $\frac{1}{85}$

C. $\frac{1}{80}$

D. $\frac{1}{79}$

Answer: A

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47. Cosine of the angle between the lines $\bar{r} = 5\hat{i} - \hat{j} + 4\hat{k} + \lambda\left(\hat{i} + 2\hat{j} + 2\hat{k}\right)$ and $\bar{r} = 7\hat{i} + 2\hat{j} + 2\hat{k} + \mu\left(3\hat{i} + 2\hat{j} + 6\hat{k}\right)$ is

A. 0

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

C. $\frac{19}{21}$

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

Answer: C

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48. IF the distance between a focus and corresponding directrix of an ellipse be 8 and the eccentricity be $\frac{1}{2}$, then length of the minor axis is

A. 3

B. $4\sqrt{2}$

C. 6

D. $\frac{16\sqrt{3}}{3}$

Answer: D

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49. 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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50. 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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51. 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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52. 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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53. 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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54. 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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55. 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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56. 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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57. 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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58. 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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59. 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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60. A square non-singular matrix A satisfies $A^2 - A + 2I = 0$, then 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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61. $\int \frac{(x+1)(x+\log x)^2}{x} dx =$

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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62. 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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63. 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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64. 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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65. $\int e^x \left(1 - \cot x + \cot^2 x\right) dx =$

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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66. 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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67. 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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68. 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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69. If the function $f(x) = \dfrac{\left(e^{kx} - 1\right)\tan kx}{4x^2}, x \neq 0$

$= 16 \qquad x = 0$

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

A. 2

B. -2

C. ± 2

D. 3

Answer: C

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70. General solution of $\tan\theta + \tan\left(\dfrac{\pi}{2} - \theta\right) = 2$ 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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71. 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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72. 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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73. 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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74. 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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75. 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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76. 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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77. 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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78. 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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79. 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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80. 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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81. 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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82. 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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83. 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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84. 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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85. 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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86. 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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87. 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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88. 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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89. 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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90. 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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91. 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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92. 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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93. 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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94. $\int_{-1}^{1} \sin^3 x \cos^2 x dx =$

A. 0

B. 1

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

D. 2

Answer: A

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95. 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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96. 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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97. 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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