MATHS

BOOKS - MODERN PUBLICATION MATHS (KANNADA ENGLISH)

MOCK TEST PAPER -I

Select The Correct Answer

1. If `A= {1,2,3} ,B= {1,2) and ={1,2} which one of the following is correct ?

A. $(A \times B) \cap (B \times A) = (A \times C) \cap (B \times C)$

B. $(A \times B) \cup (B \times A) = (A \times B) \cup (B \times C)$

C. $(A \times B) \cap (B \times A) = (C \times A) \cap (C \times B)$

D. $(A \times B) \cup (B \times A) = (A \times B) \cup (A \times C)$

Answer: B

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2. Let R be an equaivalence relation defined on a set containg 6 elements .The minimum number of ordered pairs that R should contain is :

A. 36

B. 65

C. 6

D. 12

Answer: C

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3. the number of one - one and onto mapping from A to B where n (A) = 6 and n (B) = 7 is :

A. 1000

B. 12

C. 13

D. 0

Answer: C

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4. Let $f: N \to N$ defined by

$$f(n) = \begin{cases} \frac{n+1}{2} & \text{if n is odd} \\ \frac{n}{2} & \text{if n is even} \end{cases}$$ then f is

A. one -one and onto one - one but not onto

B. onto not one- one

C. onto not one- one

D. neither one-one nor onto

Answer: B

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5. Suppose $f(x) = (x+1)^2$ for $x \geq -1$. If $g(x)$ is a function whose graph is the reflection of the graph of $f(x)$ in the line $y = x$, then $g(x) =$

A. $-\sqrt{x} - 1$

B. $\sqrt{x} - 1$

C. $\dfrac{1}{(x-1)^2 x, > -1}$

D. $\sqrt{x}+1$

Answer: B

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6. the domian of the function $f(x)=\sqrt{\cos x}$ is :

A. $\left[0, \frac{\pi}{2}\right]$

B. $\left[0, \frac{\pi}{2}\right] \cup \left[\frac{3\pi}{2}, 2\pi\right]$

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

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

Answer: B

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7. In the group {1,2,3,4,5,6} under multiplication mod $7, 2^{-1} \times 4 =$

A. 1

B. 4

C. 2

D. 3

Answer: B

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8. If $2x = -1 + I\sqrt{3}$ then the value of $(1 - x^2 + x)^6 - (1 - x + x^2)^6 =$

A. 32

B. -64

C. 64

D. 0

Answer: D

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9. If $(1+i)(1+2i)(1+3i)\ldots\ldots(1+ni) = x+iy$ then 2.5.10 .... $(1+n^2)$ $=$

A. 0

B. 1

C. $1+n^2$

D. x^2+y^2

Answer: B

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10. Let p and q be real number such that $p \neq 0, p^3 \neq q$ and $p^3 \neq -q$. If α and β non- zero complex number satifying $\alpha + \beta = -p$ and $\alpha^3 + \beta^3 = q$ then a quadratic equation having $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$ as its roots is :

A. $(p^3 + q)x^2 - (p^3 + 2p)x + (p^3 + q) = 0$

B. $(p^3 + q)x^2 - (p^3 - 2q)x + (p^3 + q) = 0$

C. $(p^3 - q)x^2 - (5p^3 - 2q)x + (p^3 - q) = 0$

D. $(p^3 - q)x^2 - (5p^3 + 2q)x + (p^3 - q) = 0$

Answer: B

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11. Let α and β the roots of $x^2-6x-2=0$ with $\alpha>\beta$ if $\alpha_n \alpha^n-\beta^n$ for n >1 then the value of

$\dfrac{a_{10}-2ds}{2a_p}$ is :

A. 1

B. 2

C. 3

D. 4

Answer: B

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12. A value of b for which the equations :

$x^2+bx-1=0, x^2+x+b=0$

Have one root in common is :

A. $-\sqrt{2}$

B. $-i\sqrt{3}$

C. $i\sqrt{5}$

D. $\sqrt{2}$

Answer: B

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13. If the value of $C_0 + 2C_1 + 3C_2 + \dots\dots + (n+1)C_n = 576$ then n is :

A. 7

B. 5

C. 6

D. 9

Answer: B

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14. The sum of first 9 terms of the series :

$$\frac{1^3}{1} + \frac{1^3 + 2^3}{1 + 3} + \frac{1^3 + 2^3 + 3^3}{1 + 3 + 5} + \ldots. \text{ is :}$$

A. 71

B. 96

C. 142

D. 192

Answer: B

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15. The line joining A(2-7) and B (6,5) is divided into 1 equal parts by the points P,Q and R such that AQ = RP =-QB .the mid - point of PR is :

A. $(8, \ -2)$

B. $(4, \ -1)$

C. $(-8, \ -1)$

D. $(4, 12)$

Answer: A

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16. The distance of the focus of $x^2 - y^2 = 4$ from the directrix which is near to it is :

A. $\sqrt{2}$

B. $2\sqrt{2}$

C. $8\sqrt{2}$

D. $4\sqrt{2}$

Answer: D

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17. If the coefficient of variation and standard deviation are 60 and 21 respectively, the arithmetic mean of distribution is

A. 30

B. 21

C. 60

D. 35

Answer: B

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18. The value of $\sin\left(2\sin^{-1}0.8\right)$ is equal to

A. $\sin^{1.2^{\circ}}$

B. 0.96

C. 0.48

D. $\sin 1.6^{\circ}$

Answer: A

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19. If $p \to (q \vee r)$ is false, then the truth values of p,q,r are respectively

A. T,F,F

B. F,F,T

C. F,T,T

D. T,T,F

Answer: D

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20. $\sin\left(2\sin^{-1}\sqrt{\frac{63}{65}}\right) =$

A. $\frac{\sqrt{63}}{65}$

B. $\frac{8\sqrt{63}}{65}$

C. $\frac{4\sqrt{65}}{65}$

D. $\frac{2\sqrt{126}}{65}$

Answer: D

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21. If $x \neq n\pi, x \neq (2n+1)\frac{\pi}{2} n \in Z,$ then :

$$\sin^{-1}\left(\frac{\sin^{-1}(\cos x) + \cos^{-1}(\sin x)}{\tan^{-1}(\cot x) + \cot^{-1}(\tan x)}\right) =$$

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

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

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

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

Answer: D

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22. The value $\sin^{-1}\left(\frac{2\sqrt{2}}{3}\right)+\sin^{-1}\left(\frac{1}{3}\right)$ is equal to

A. $\frac{\pi}{6}$

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

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

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

Answer: D

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23. Solve for X :

A. $\sqrt{3}$

B. 1

C. -1

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

Answer: D

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24. The constant term of the polynormial

$\{|:(x+3, x, x+2),(x, x+1, x-1),(x+2, 2x, +3x+1):|\}$

is

A. 1

B. -1

C. 2

D. 0

Answer: B

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25. If $A = \begin{vmatrix} x & 1 & 1 \\ 1 & x & 1 \\ 1 & 1 & x \end{vmatrix}$ and $B = \begin{vmatrix} x & 1 \\ 1 & x \end{vmatrix}$, then $\frac{dA}{dx} =$

A. $3B + 1$

B. $3B$

C. $-3B$

D. $1 - 3B$

Answer: B

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26. If $P = \begin{vmatrix} x & 1 \\ 1 & x \end{vmatrix}$ and $Q = \begin{vmatrix} x & 1 & 1 \\ 1 & x & 1 \\ 1 & 1 & x \end{vmatrix}$ then $\frac{dQ}{dx}$ = ______

A. $3p + 1$

B. $1 - 3P$

C. $-3p$

D. $3p$

Answer: D

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27. If A is 3×3 non- singular matrix and if $|A| = 3$ then $\left|(2A)^{-1}\right| =$

A. $\frac{1}{24}$

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

C. 3

D. 24

Answer: A

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28. If $A = \begin{bmatrix} 3 & 2 \\ 1 & 1 \end{bmatrix}$ then $A^2 + xA + yI = 0$ for (x,y) =

A. (1,3)

B. (4,1)

C. (-1,3)

D. (-4,1)

Answer: D

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29. If $|adj.\ A| = 25[A \text{ is of order } 3]$ then $|A^{-1}| =$

A. 0.2

B. ± 5

C. $\frac{1}{\sqrt[5]{625}}$

D. ± 0.2

Answer: D

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30. If $f(x) = \begin{cases} \frac{3 \sin \pi x}{5x} & x \neq 0 \\ & x = 0 \end{cases}$ is continuous at x=0 then the value of K is equal to :

A. $\frac{3\pi}{10}$

B. $\frac{3\pi}{5}$

C. $\frac{\pi}{10}$

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

Answer: A

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31. If the fucntion f (x) satisfies $\lim_{x \to 1} . \frac{f(x) - 2}{x^2 - 1} = \pi$

A. 2

B. 3

C. 1

D. 0

Answer: A

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32. If the three function $f(x), g(x)$ and $h(x)$ are such that $h(x) = f(x)g(x)$ and $f'(a)g'(x) = c$, where c is a constant, then :

$\frac{f''(x)}{f(x)} + \frac{g''(x)}{g(x)} + \frac{2c}{f(x)f(x)}$ is equal to :

A. $\frac{h(x)}{h(x)}$

B. $\frac{h(x)}{h(x)}$

C. $\frac{h(x)}{h(x)}$

D. $h'(x).\ h(x)$

Answer: B

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33. the derivative of $e^{ax}\cos$ bx with respect to x is $re^{ax}\cos\left(bx+\frac{\tan^{-1}(b)}{a}\right)$ when $a>0, b>0$ then value r is

A. $a+b$

B. ab

C. $\frac{1}{\sqrt{ab}}$

D. $\sqrt{a^2+b^2}$

Answer: D

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34. If $x=a\cos^3\theta$ and y = a $\sin^3\theta$ then $\frac{dy}{dx}=$

A. $\frac{3\sqrt{y}}{x}$

B. $-3\sqrt{\frac{x}{y}}$

C. $3\sqrt{\frac{x}{y}}$

D. $3\sqrt{\frac{y}{x}}$

Answer: D

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35. If $y = \tan^{-1}\sqrt{x^2 - 1}$ then the ratio $\frac{d^2y}{dx^2} : \frac{dy}{dx} =$

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

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

C. $\frac{1 - 2x^2}{x(x^2 - 1)}$

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

Answer: C

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36. If $\sqrt{r} = ae^{\theta \cot \alpha}$ where a and α are real numbers then $\frac{d^2r}{d\theta^2} - 4r\cot^2\alpha$ is

A. r

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

C. 1

D. 0

Answer: D

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37. P is the point of contact of the tangent from the orign to the curve $y = \log_e^x$. the length of the perpendicular drawn from the

origin to the normal at P is

A. $\sqrt{e^2+1}$

B. $\sqrt{e^2+1}$

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

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

Answer: A

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38. The lengths of the sub-tangent , ordinate and the sub-normal are in

A. $\left(\frac{5}{4}\right)^4$

B. $\left(\frac{4}{5}\right)^{-4}$

C. $y\left(\frac{5}{4}\right)^{4}$

D. $x\left(\frac{4}{5}\right)^{5}$

Answer: B

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39. the set of real values of x for which $f(x)=\frac{x}{\log x}$ is increasing is :

A. $\{1\}$

B. $\{x : x < e\}$

C. empty

D. $\{x : x gle\}$

Answer: D

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40. A wire of lenggth 20 cm is bent in the form of a sector of a circle. The maximum area that can be snclosed by the wire is

A. 30 sq. cm

B. 10 sq. cm

C. 25 sq. cm

D. 20 sq. cm

Answer: C

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41. if $\int f(x) \sin x \cos x dx = \frac{1}{2(b^2 - a^2)}$ log f(x) + c where C is a constant of intergration then f(x) =

A. $\dfrac{2}{(b^2 - a^2)\sin 2x}$

B. $\dfrac{2}{absin2x}$

C. $\dfrac{2}{(b^2 - a^2 \cos 2x)}$

D. $\dfrac{2}{ab\cos 2x}$

Answer: C

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42. $\int \dfrac{\sin^{-1}}{\sqrt{1+x}} dx =$

A. $2\sqrt{1+x}\sin^{-1}x + 2\sqrt{1-x} + c$

B. $2\sqrt{1+x}\left(\sin^{-1}x + 2\right) + c$

C. $2\sqrt{1+x}\sin^{-1}x + 4\sqrt{1-x} + c$

D. None of these.

Answer: C

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43. $\int \frac{\cos^{n-1}}{\sin^{n+1}} dx, n \neq 0$ is :

A. $\frac{\cot^n x}{n} + C$

B. $\frac{\cot^{n-1}}{n-1} + C$

C. $\frac{-\cot^n x}{n} + C$

D. $\frac{\cot^{n-1}}{n-1} + C$

Answer: C

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44. The value of the intergral $\int_0^{\pi/2} \left(\sin^{100} x - \cos^{100} x\right) dx$ is :

A. $\frac{100!}{(100)^{100}}$

B. $\frac{1}{100}$

C. 0

D. $\frac{\pi}{100}$

Answer: C

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45. If [x] denote the greatest integer function , then , $\int_0^{\pi/6} \frac{1-\cos 2x}{1+\cos 2x} d(x-[x]) =$

A. $\frac{1}{\sqrt{3}} + \frac{\pi}{6}$

B. $\frac{1}{\sqrt{3}} - \frac{\pi}{6}$

C. $\sqrt{3} - \frac{\pi}{6}$

D. $\sqrt{3} + \frac{\pi}{6}$

Answer: B

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46. The area bounded by the curve :

$y = \begin{cases} x^2 & x < 0 \\ x & x \geq 0 \end{cases}$ and the line $y = 4$ is:

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

B. $\frac{40}{3}$

C. $\frac{8}{3}$

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

Answer: B

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47. If m and n are the order and degree of the different equatin :

$$\left(y^{''}\right) + 4\frac{\left(y^{''}\right)^3}{y^{'''}} + y^{'''} = \sin x \text{ then :}$$

A. m = 3 ,n=5

B. m=3,n=1

C. m=3,n=3

D. m=3,n=2

Answer: D

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48. The general solution of the differential equation $\sqrt{1-x^2y^2}.\,dx = y.\,dx + x.\,dy$ is

A. $\sin(xy) = x + c$

B. $\sin^{-1}(xy) + x = c$

C. $\sin(x + c) = xy$

D. $\sin(xy) + x = c$

Answer: C

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49. The distance of the point P(a, b, c) from the x-axis is

A. $\sqrt{b^2 + c^2}$

B. $\sqrt{a^2 + c^2}$

C. $\sqrt{a^2 + b^2}$

D. a

Answer: A

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50. Equation of the plane perpendicular to the line $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$ and passing through the point (2,3,4) is :

A. x+ 2y + 3z= 9

B. x+ 2y + 3z =20

C. 2x+ 3y + z=17

D. 3x +2y + z=16

Answer: B

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51. The line $\frac{x-2}{3}=\frac{y-3}{4}=\frac{z-4}{5}$ is parallel to the plane

A. $3x+4y+5z=7$

B. $x+y+z=2$

C. $2x+3y+4z=0$

D. $2x+y-2x=0$

Answer: D

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52. A space vector makes angles 150° and 60° with the positive direction of x and y- axes . The angle made by the vector with the positive direction of z- axis is :

A. 120°

B. 180°

C. 60°

D. 90°

Answer: D

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53. If $\vec{a}$, $\vec{b}$ and $\vec{c}$ are unit vectors such that $\vec{a}+\vec{b}+\vec{c}=0$, then $3\vec{a}.\vec{b}+2\vec{b}.\vec{c}+\vec{c}.\vec{a}=$

A. 3

B. -3

C. 1

D. -1

Answer: B

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54. If $\hat{i}, \hat{j}, \hat{k}$ are unit vectors alng the positive directin of$x - y -$ are z-axis then a false statement in the following is :

A. $\Sigma\hat{i}\left(\hat{j}+\hat{k}\right)=0$

B. $\Sigma\hat{i}.\left(\hat{j}\times\hat{k}\right)=0$

C. $\Sigma\hat{i}\times\left(\hat{j}\times\hat{k}\right)=\hat{0}$

D. $\Sigma\hat{i}\times\left(\hat{j}+\hat{k}\right)=0$

Answer: B

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55. A and B are two events such that $P(A) \neq 0$, $P(B/A)$ is

A. A is a subset of B

B. 1,0

C. 1,1

D. 0

Answer: B

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56. Two dice are thrown simultaneously, the probability of obtaining a total score of 5 is

A. $\frac{1}{18}$

B. $\frac{1}{12}$

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

D. $\frac{1}{36}$

Answer: C

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57. If the events A and B are independent if

$P(A) = \frac{2}{3}$ and $P(B) = \frac{2}{7}$

then $P(A \cap B)$ is equal to :

A. $\frac{5}{21}$

B. $\frac{3}{21}$

C. $\frac{4}{21}$

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

Answer: A

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58. A box contains 100 bulbs, out of which 10 are defective. A sample of 5 bubls is drawn. The probability that none is defective is

A. $\left(\frac{1}{10}\right)^5$

B. $\left(\frac{1}{2}\right)^5$

C. $\frac{9}{10}$

D. $\left(\frac{9}{10}\right)^5$

Answer: B

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59. A Class has 175 students .The following data shown the number of student : Physics 70 : Chemistry 40 : Mathematics 100 : Physics and Chemistry 23: Mathematics and Chemistry 28 Mathematics Physics and Chemistry 18 .How many students have offered Mathematics alone ?

A. 35

B. 48

C. 60

D. 22

Answer: C

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60. The set $S = \{1, 2, 3. \ldots \ldots . 12\}$ is to be partitioned into three sets A,B,C equal size .Thus.

$A \cup B \cup C = S, a \cap B = B \cap C = A \cap C = \phi$ the number of partitions of S is

A. $\frac{12!}{3!(3!)^4}$

B. $\frac{12!}{(4!)^3}$

C. $\frac{12!}{(3!)^4}$

D. $\frac{12!}{3!(4!)^3}$

Answer: B

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61. Let A and B be two sets containing four and two elements respectively tehn the number of subsets of the set $A \times B$ each having at least three elements is

A. 219

B. 256

C. 275

D. 510

Answer: A

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62. Let S be the set of all real numbers. A relation R has been defined on S by a Rb $\Rightarrow |a-b| \leq 1$, then R is

A. relexive an transitive but not symmetric

B. an equivalence relation

C. symmetric and transitive but not reflexive

D. reflexive and symmetric but not transitiv

Answer: D

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63. Suppose $f(x) = (x+1)^2$ for $x \geq -1$. If $g(x)$ is a function whose graph is the reflection of the graph of $f(x)$ in the line $y = x$, then $g(x) =$

A. $-\sqrt{x} - 1$

B. $\sqrt{x} - 1$

C. $\frac{1}{(x-1)^2} > -1$

D. $\sqrt{x} + 1$

Answer: B

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64. A real valued functio f(x) satisfies the functional equation

f(x-y)=f(y)-f(a-x)f(a+y)

where a is given constant and f(0) =1 f(2a-x) is equal to

A. f(x)

B. $-f(x)$

C. f(-x)

D. f(a)+f(a-x)

Answer: B

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65. If (x) $\begin{cases} x & x \in Q \\ 0 & x \neq Q \end{cases}$ and g(x)=$\begin{cases} x & x \in Q \\ 0 & x \in Q \end{cases}$ then (f-g) will be

A. one one onto

B. one-one into

C. many one onto

D. many one into

Answer: A

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66. If x and y are two non exptys sets where $f: X \to Y$ is function defined such that $f(C) = \{f(x): x \in C\}$ and f (d)= (x:f(x) in D}f or $D \supseteq Y$ for any $A \supseteq X$ and B supeY` then

A. $f\left(f^{-1}(B)\right)$=B only if B =f(x)

B. $f\left(f^{-1}(B)\right)$=B only if B $\subset f(X)$

C. $f\left(f^{-1}\right)(B)\right)$= only if $B \subseteq f(x)$

D. $f\left(f^{-1}(B)\right)$ never equals B

Answer: B

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67. The largest interval lying in $\left[\frac{-\pi}{2}, \frac{\pi}{2}\right]$ for which the function f(x)=$\left[4^{-x^2+\cos^{-1}\left(\frac{x}{2}-1\right)}+\log(\cos x)\right.$ is defined is :

A. $-\frac{\pi}{2}, \frac{\pi}{2}$

B. $-\frac{\pi}{4}, \frac{\pi}{2}$

C. $0, \frac{\pi}{2}$

D. $[0, \pi]$

Answer: C

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68. Prove that the funciton $f: R \rightarrow R$ defined by f(x)=4x+3 is invertible and find the inverse of f.

A. $g(y) = \frac{y-3}{4}$

B. $g(y) = \frac{3y+4}{3}$

C. $g(y) = 4 + \frac{y+3}{4}$

D. $g(y) = \frac{y+3}{4}$

Answer: A

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69. If z is a complex number such that |z| $>$ 2 then the minimum value of $\left|z + \frac{1}{2}\right|$

A. lies in the interval $(1, 2)$

B. is strictly greater than $\frac{5}{2}$

C. is strictly greater than $\frac{3}{2}$ but less than $\frac{5}{2}$

D. is equal to $\frac{5}{2}$

Answer: A

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70. A complex number z is said to be unimodular if |z| =1 suppose z_1 and z_2 are complex numebers such that $\frac{z_1 - 2z_2}{2 - z_1 z_2}$ is unimodular and z_2 is not unimodular then the point z_1 lies on a

A. straight line parallel to x axis

B. straight line paralle to y axis

C. circle of radius 2

D. circle of radius $\sqrt{2}$

Answer: C

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71. Let a,b,c be the sides of a triangle no two of them are equal and $\lambda \in R$ if the roots of the equation $x^2 + 2(a+b+c) + 3\lambda$ (ab+bc+ca=0) are real then

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

B. $\lambda > \frac{5}{3}$

C. $\lambda \in \left(\frac{1}{3}, \frac{5}{3}\right)$

D. $\lambda \in \left(\frac{4}{3}, \frac{5}{3}\right)$

Answer: A

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72. Let α, β be the roots of the equation $x^2 - px + r = 0$ and $\frac{\alpha}{2}, 2\beta$ be the roots of the equation $x^2 - qx + r = 0$ then the value of r is

A. $\frac{2}{9}(p-q)(2q-p)$

B. $\frac{2}{9}(q-p)(2p-q)$

C. $\frac{2}{9}(q-2p)(2q-p)$

D. $\frac{2}{9}(2p-q)(2q-p)$

Answer: D

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73. If the roots of the equation $bx^2 + cx + a = 0$ be imaginary then fro all real value4s of x the expression $3b^2x^2 + 6bcx + 2c^2$ is

A. greater than 4ab

B. less than 4ab

C. greater than -4ab

D. less than -ab

Answer: C

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74. The sum of coefficients of integral powers of x in the binominal expansion of $\left(1-2\sqrt{x}^{50}\right)$ is

A. $\frac{1}{2}\left(3^{50}+1\right)$

B. $\frac{1}{2}\left(3^{50}\right)$

C. $\frac{1}{2}\left(3^{50-1}\right.$

D. $\frac{1}{2}\left(2^{50}+1\right)$

Answer: A

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75. If

$$(10)^9 + 2(11)^1 + (10)^8 + 3(11)^2(10)^7 + \ldots + 10(11)^9 = k(10)^9$$

then k is equal to

A. $\frac{441}{100}$

B. 100

C. 110

D. $\frac{121}{10}$

Answer: B

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76. A straight line passes through the points (5, 0) and (0, 3). The length of perpendicular from the point (4, 4) on the line is

A. $\frac{\sqrt{17}}{2}$

B. $\frac{\sqrt{17}}{2}$

C. $\frac{15}{\sqrt{34}}$

D. $\frac{17}{2}$

Answer: B

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77. The equation of a hyperbola whose asymtotes are 3x $\pm$ 5y=0 and vertices are $(\pm 5, 0)$ is

A. $3x^2 - 5y^2 = 0$

B. $5x^2 - 3y^2 = 25$

C. $25x^2 - 9y^2 = 225$

D. $9x^2 - 25y^2 = 225$

Answer: D

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78. All the students of a class performed poolrly in mathematics which of the following statistical measures will not change evern after the grace marks were given

A. median

B. mode

C. variance

D. mean

Answer: C

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79. Let $f_k(x) = \frac{1}{k}\left(\sin^k x + \cos^k x\right)$ where $x \in R$ and $k \geq 1$ then $f_4(x) - f_6(x)$ equals

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

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

C. $\frac{1}{12}$

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

Answer: C

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80. Let p be the proposition. Mathematics is interesting and let q be the proposition mathematics is difficult, then the symbol $p \cap q$ means

A. mathematics is intersecting implies that mathematics is difficult

B. mathematics is intersecting implies and is implied by mathematics is difficult

C. mathematics is intersecting and mathematics is difficult

D. mathematics is intersecting or mathematics is difficult

Answer: C

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81. Value of $\frac{\tan^{-1} 1}{3} + \frac{\tan^{-1} 1}{5} + \frac{\tan^{-1} 1}{7} + \frac{\tan^{-1} 1}{8}$ is

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

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

C. $\pi)$

D. none of these

Answer: A

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82. If $\frac{\tan^{-1}\left(\sqrt{1+x^2}-1\right)}{x} = 4$ then x equals

A. tan 2

B. tan 4

C. tan 6

D. tan 8

Answer: D

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83. The integral solution of $\tan^{-1}x+\dfrac{\tan^{-1}(1)}{y}=\tan^{-1}3$ is

A. (1,4)

B. (2,1)

C. (3,13)

D. none of these

Answer: D

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84. If $\sin^{-1}x + \cos^{-1}(1 - x) = \sin^{-1}(-x)$then x satisfies

A. $2x^2 + 3x + 1 = 0$

B. $2x^2 - 3x = 0$

C. $2x^2 + x - 1 = 0$

D. $2x^2 + x + 1 = -0$

Answer: B

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85. The number of values of k for which the system of equations :

$(k + 1)x + 8y = 4k$

$kx + (k + 3)y = 3k - 1$

has no solution is:

A. 1

B. 2

C. 3

D. infinite

Answer: C

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86. If $\alpha, \beta \neq 0$ and $f(n) = \alpha^n + \beta^n$ and

$$\begin{vmatrix} 3 & 1+f(1) & 1+f(2) \\ 1+f(1) & 1+f(2) & 1+f(3) \\ 1+f(2) & 1+f(3) & 1+f(4) \end{vmatrix}$$

$= k(1-\alpha)^2(1-\beta)^2(\alpha-\beta)^2$ then k is equal to

A. $\dfrac{1}{\alpha\beta}$

B. 1

C. -1

D. $\alpha\beta$

Answer: B

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87. The set of all values of λ for which the system of linear equation |(2x_(1)-2x_(2)+x_(3),=lambdax_(1)), (2x_(1)-3x_(2)+2x_(3),=lambdax_(2)),(-x(1)+2x_(2),=lambdax_(3))|` has a non trivial solution

A. is an empty set

B. is a singleton

C. contains two elements

D. contains more than two elements

Answer: C

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88. The inverse of the matrix $A = \begin{bmatrix} 2 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 4 \end{bmatrix}$ is

A. $\begin{bmatrix} 2 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 4 \end{bmatrix}$

B. $\begin{bmatrix} \frac{1}{2} & 0 & 0 \\ 0 & \frac{1}{3} & 0 \\ 0 & 0 & \frac{1}{4} \end{bmatrix}$

C. $\frac{1}{24}\begin{bmatrix} 2 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 4 \end{bmatrix}$

D. $\frac{1}{24}\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

Answer: B

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89. If A= $\begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$ then A^n is

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

B. $\begin{bmatrix} 1 & n^2 \\ 0 & 1 \end{bmatrix}$

C. $\begin{bmatrix} 1 & 2n \\ 0 & 1 \end{bmatrix}$

D. $\begin{bmatrix} 1 & n^2 \\ 1 & 1 \end{bmatrix}$

Answer: C

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90. If $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ then A^2 is equal to ______

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

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

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

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

Answer: A

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91. The function $f(x) = [x]$ where $[x]$ is the greatest integer function is continous at

A. 4

B. -2

C. 1

D. 1.5

Answer: D

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92. $f(x) = \begin{cases} 3x - 8 & \text{if} x \leq 5 \\ 2k & \text{if} x > 5 \end{cases}$

A. $\frac{2}{7}$

B. $\frac{3}{7}$

C. $\frac{4}{7}$

D. $\frac{7}{2}$

Answer: D

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93. If x+y=$\tan^{-1} y$ and $\frac{d^2y}{dx^2} = f(y)\frac{dy}{dx}$ then f(y)=

A. $-\frac{2}{y^3}$

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

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

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

Answer: B

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94. Let $f(x) = \cos^{-1}\left[\frac{1}{\sqrt{13}}(2\cos x - 3\sin x)\right]$. Then f(0.5) =

A. 0.5

B. 1

C. 0

D. -1

Answer: B

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95. If $y=(1+x)\left(1+x^2\right)\left(1+x^4\right)$, then $\frac{dy}{dx}$ at $x=1$ is

A. 28

B. 0

C. 20

D. 1

Answer: A

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96. If $y=\left(\tan^{-1}x\right)^2$ then show that $\left(x^2+1\right)^2\frac{d^2y}{dx^2}+2x\left(x^2+1\right)\frac{dy}{dx}=2$

A. 0

B. 1

C. 4

D. 2

Answer: D

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97. If the function $f(x)$ defined by

$$f(x) = \frac{x^{100}}{100} + \frac{x^{99}}{99} + \dots . + \frac{x^2}{2} + x + 1, \text{then } f'(0) =$$

A. 100

B. -1

C. $100f(0)$

D. 1

Answer: D

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98. The maximum area of rectangle that can be inscribed in a circle of radius 2 units is

A. 8π sq units

B. 4 sq units

C. 5 sq units

D. 8 sq units

Answer: B

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99. A stone is dropped into a quiet lake and waves in circles at the speed of 5 cm/s. At the instant when the radius of the circular wave is 8 cm, how fast is the enclosed area increasing?

A. $8xc\frac{m^2}{s}$

B. $80\pi c\frac{m^2}{s}$

C. $6\pi c\frac{m^2}{s}$

D. $\frac{8}{3}c\frac{m^2}{s}$

Answer: B

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100. A gardener is digging a plot of land. As he gets tired, he works more slowly, After 't' minutes he is digging at a rate of $\frac{2}{\sqrt{t}}$

square metres per minute. How long will it take him to dig an area of 40 square metres ?

A. 10 minutes

B. 40 minutes

C. 100 minutes

D. 30 minutes

Answer: C

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101. If f(x)=x^3 and g(x)=x^3-4x in $-2 < x < 2$ then consider the statements

(a) f(x) and g(x) satisfy mean value theorem

(b) f(x) and g(x) both satisfy rolle 's theorm (c) only g(x) satisfies rolle 's theorem

OF THE STATEMENTS

A. a alone is correct

B. a and c are correct

C. a and b are correct

D. none is correct

Answer: B

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102. $\int \frac{1}{x^2(x^4+1)^{3/4}} dx$ is equal to ________.

A. $\frac{-(+x^4)^{1/4}}{x} + C$

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

C. $\frac{-\left(+x^4\right)^{1/4}}{2x}+C$

D. $\frac{-\left(+x^4\right)^{3/4}}{x}+C$

Answer: A

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103. $\in \frac{\sin^2 x}{1+\cos x}$ dx=

A. x+ sin x+C

B. x-sin x+C

C. sin x+C

D. cos x +C

Answer: B

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104. $\int e^{x} \frac{1+\sin x}{1+\cos x}$ dx is equal to

A. $e^{x} \frac{\tan(x)}{2} + c$

B. $\frac{\tan(x)}{2} + C$

C. $e^{x} + C$

D. $e^{x} \sin x + C$

Answer: A

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105. The value of $\int_{-1}^{2} \frac{|x|}{x}$ dx is

A. 0

B. 1

C. 2

D. 3

Answer: B

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106. $\int_0^{\frac{\pi}{2}} \frac{\cos^4 x}{\cos^4 x + \sin^4 x}$ dx =

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

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

C. $\frac{\pi}{8}$

D. (π)

Answer: A

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107. The area bounded by the curve $y = \sin\left(\frac{x}{3}\right)$, x-axis and lines x=0 and $x = 3\pi$ is

A. 9

B. 0

C. 6

D. 3

Answer: C

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108. The particular solution of $\frac{y}{x}\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$ when x=1 y=2 is

A. $5(1+y^2) = 2(1+x^2)$

B. $2(1+y^2) = 5(1+x^2)$

C. $5(1+y^2) = (1+x^2)$

D. $(1+y^2) = 2(1+x^2)$

Answer: B

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109. The solution of the differential equation $\frac{dy}{dx} = (x+y)^2$ is

A. $\frac{1}{x+y} = c$

B. $\sin^{-1}(x+y) = x+c$

C. $\tan^{-1}(x+y) = c$

D. $\tan^{-1}(x+y) = x+c$

Answer: D

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110. The angle between the lines whose direction cosines satisfy the equation $l+m+n=0$ and $l^2=m^2+n^2$ is

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

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

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

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

Answer: D

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111. The distance of the point (1,0,2) from the point of intersection of the line $\frac{x-2}{3}=\frac{y+1}{4}=\frac{z-2}{12}$ and the plane x-y+z=16 is

A. $2\sqrt{14}$

B. 8

C. $3\sqrt{21}$

D. 13

Answer: D

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112. The equatin of the plane containing the line 2x-5y+z=3,x+y+4z=5 and parallel to the plane x +3y+6z=1 is

A. 2x+6y+12z=13

B. x+3y+6z=-7

C. x+3y+6z=7

D. 2x+6y-12z=-13

Answer: C

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113. Let $\overrightarrow{P}R = 3\hat{i} + \hat{j} - 2\hat{k}$ and $\overrightarrow{S}Q = \hat{i} - 3\hat{j} - 4\hat{k}$ determine diagonals of a parallelogram PQRS and $\overrightarrow{P}T = \hat{i} + 2\hat{j} + 3\hat{k}$ be another vector the volume of the paralleopiped determined by the vectors $\overrightarrow{P}T, \overrightarrow{P}Q$ and $\overrightarrow{P}S$ is

A. 5

B. 20

C. 10

D. 30

Answer: C

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114. If $\left[\bar{a}\times\bar{b}\bar{b}\times\bar{c}\bar{c}\times\bar{a}\right]=\lambda\left[\bar{a}\bar{b}\bar{c}\right]^{2}$ then λ is equal to

A. 3

B. 0

C. 1

D. 2

Answer: C

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115. Let $\vec{a}$, $\vec{b}$ and $\vec{c}$ be three non zero vectors such that no two of them are collinear and $\left(\vec{a}\times\vec{b}\right)\times\vec{c}=\frac{1}{3}\left|\vec{b}\right|\left|\vec{c}\right|\vec{a}$ if θ the angle between the vectors $\vec{b}$ and $\vec{c}$ then a value of $\sin\theta$ is

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

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

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

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

Answer: A

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116. 6 boys and 6 girls sit in a row at random the probability that all the girls sit together is

A. $\frac{1}{432}$

B. $\frac{12}{431}$

C. $\frac{1}{132}$

D. none of these

Answer: C

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117. An urn contains 9 balls , 2 of which are white, 3 blue and 4 black. 3 balls are drawn at random from the urn. The chance that 2 balls will be of the same colour and the third of a different colour is:

A. $\frac{45}{84}$

B. $\frac{55}{84}$

C. $\frac{35}{84}$

D. $\frac{25}{84}$

Answer: B

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118. Three dice are rolled once the chance of getting a score of 5 is

A. $\frac{5}{216}$

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

C. $\frac{1}{36}$

D. $\frac{1}{7^2}$

Answer: C

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119. A bag contaings 3 white 4 black 2 red balls if 2 balls are drawn at random then the probability that both the balls are white is

A. $\frac{1}{18}$

B. $\frac{1}{36}$

C. $\frac{1}{12}$

D. $\frac{1}{24}$

Answer: C

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120. An urn contains nine balls of which three are red four are blue and two are green three balls are drawn at random the probability that the three balls different colours is

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

B. $\frac{2}{7}$

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

D. $\frac{2}{23}$

Answer: B

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121. From 50 students taking examinations in mathematics ,physics and chemistry ,37 passed mathematics, 24 physics and 43 chemistry. At most 19 passed mathematics and physics, at most 29 Mathematics and Chemistry and at most 20 Physics and Chemistry. The largest possible number that could have passed all three examinations is:

A. 9

B. 10

C. 12

D. none of these

Answer: D

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122. If two sets a and b have 99 elements in common then the number of elements common to the sets A x B and B xA is

A. 2^{99}

B. 99^{2}

C. 100

D. 18

Answer: B

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123. If a set A has 4 elements then total number of proper subsets of set A is

A. 16

B. 14

C. 15

D. 17

Answer: C

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124. If 3x=5 (mod 7) then

A. x=2(mod 7)

B. x=3 (mod 7)

C. x=4 (mod 7)

D. none of these

Answer: C

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125. If f(x)=e^x and g(x)=$\log^{e^x}$ then which of the following is TRUE

A. $f\{g(x)\}$ne$g(f(x)\}$

B. $f\{g(x)\} = g(f(x)\}$

C. $f\{g(x)\} + g(f(x)\}$

D. $f\{g(x)\} - g(f(x)\}$

Answer: B

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126. The number of bijective functions from the set A to itself if a contains 108 elements is

A. 108

B. (108)!

C. $(108)^2$

D. 2^{108}

Answer: B

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127. If $2x = -1 + \sqrt{3}i$, then the value of $(1 - x^2 + x)^6 - (1 - x + x^2)^6 =$

A. 32

B. -64

C. 64

D. 0

Answer: D

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128. If a, b,c , d are the roots of the equation :

$x^4 + 2x^3 + 3x^2 + 4x + 5 = 0$,

then $1 + a^2 + b^2 + c^2 + d^2$ is equal to :

A. -2

B. -1

C. 1

D. 1

Answer: B

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129. The expression :

$$\frac{1}{\sqrt{(3x+1)}}\left(\left\{\left(\frac{1+\sqrt{3x+1}}{2}\right)^7-\left(\frac{1-\sqrt{3x+1}}{2}\right)^7\right\}\right)$$

is a polynomial in x of degree is :

A. 7

B. 5

C. 4

D. 3

Answer: D

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130. The number of triangles in a complete graph with 10 non collinear vertices is

A. 360

B. 240

C. 120

D. 60

Answer: C

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131. If x^r occurs in the expansions of $\left(x+\frac{1}{x}\right)^n$ then its coefficient is

A. $\frac{n!}{(r!)^2}$

B. $\frac{n!}{r+1}!(r-1)!$

C. $\frac{n!}{\frac{n+r}{2}!\frac{n-r}{2}!}$

D. $\frac{n!}{\left[\frac{r}{2}!\right]^2}$

Answer: C

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132. If in the expansion of $(1+x)^m(1-x)^n$ the coefficients of x and x^2 are 3 and -6 respective then m is

A. 6

B. 9

C. 12

D. 24

Answer: C

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133. If the straight line ax +by+c=0 always passes through (1,-2) then a,b,c are in

A. H.P

B. A.P

C. G.P

D. none of these

Answer: B

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134. A straight line through P(1,2) is such that the intercept between the axes is bisected at p then the equation of the straight line is

A. x+y=1

B. x+y=3

C. x+2y=5

D. 2x+y=4

Answer: D

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135. If the line through A=(4,-5) is inclined at an anlge 45° with the positive of the x axis then the co ordinates of the two points on opposite sides of a at a distance $3\sqrt{2}$ are

A. (7,2),(1,8)

B. (7,2),(1,-8)

C. (7,-2),(1,-8)

D. (7,2),(-1,8)

Answer: C

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136. The mean and variance for the data 6,7,10,12,13,4,8,12 respectively are

A. $8, \sqrt{26.25}$

B. $9, \sqrt{9.25}$

C. $8, 26.25$

D. $9, 9.25$

Answer: D

Watch Video Solution

137. If $\tan(x+y)=33$, and $x=\tan^{-1}3$, then: y=

A. $\frac{3}{10}$

B. $\frac{33}{10}$

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

D. $\frac{\tan^{-1}3}{10}$

Answer: D

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138. Prove that: $\frac{\sin x-\sin 3x}{\sin^2 x-\cos^2 x}=2\sin x$

A. $-2\sin x$

B. $\dfrac{2}{\sin x}$

C. $\dfrac{1}{\sin x}$

D. 2 sin x

Answer: D

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139. The number of solution of the eqution $|\cot x| = \cot x + \dfrac{1}{\sin x}(0 \leq x \leq 2\pi)$ is

A. 0

B. 1

C. -1

D. none of these

Answer: B

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140. The number of solution of the eqution $|\cot x| = \cot x + \frac{1}{\sin x}(0 \leq x \leq 2\pi)$ is

A. 0

B. 1

C. 2

D. 3

Answer: B

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141. $\cot^{-1}(21)+\cot^{-1}(13)+co^{-1}(8)=$

A. 0

B. $\cot^{-1}26$

C. π

D. none of these

Answer: A

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142. $\tan\left(\frac{\cos^{-1}(1)}{5\sqrt{2}}-\frac{\sin^{-1}(4)}{\sqrt{17}}\right)$ is

A. $\frac{\sqrt{29}}{3}$

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

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

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

Answer: D

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143. If a,b,c are A.P then the value of the determinant

$$\begin{vmatrix} x+2 & x+3 & x+2a \\ x+3 & x+4 & x+2b \\ x+4 & x+5 & x+2c \end{vmatrix}$$

A. 0

B. 1

C. x

D. 2x

Answer: C

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144. If $A = \begin{bmatrix} \alpha & 2 \\ 2 & \alpha \end{bmatrix}$ and $A^3 = 27$ then $\alpha =$ ________

A. ± 1

B. ± 2

C. $\pm \sqrt{7}$

D. $\pm \sqrt{5}$

Answer: C

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145. If A = $\begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$ and A^8 =aA+bI , then (a,b) =

A. (8,7)

B. (-7,8)

C. (8,-7)

D. (-8,-7)

Answer: C

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146. If A = $\begin{bmatrix} a & 0 & 0 \\ 0 & a & 0 \\ 0 & 0 & a \end{bmatrix}$ then det (Adj A) is

A. a^{27}

B. a^{5}

C. a^{6}

D. a^{2}

Answer: C

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147. $\lim_{x \to \infty} \left(\sqrt{a^2x^2 + bx + c} - ax\right) =$

A. $\frac{b}{2a}$

B. $\frac{b}{a}$

C. 0

D. $\frac{2b}{a}$

Answer: A

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148. If y = log $1 - \frac{x^{x^2}}{1+x^2}$ then $\frac{dy}{dx}$ is equal to

A. $\frac{-4x}{1-x^4}$

B. $\frac{4x^3}{1-x^4}$

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

D. $\frac{-4x^3}{4-x^4}$

Answer: A

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149. If f(x)=$\log_{x^2}(\log x)$, then f(x) at x=e is

A. 0

B. 1

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

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

Answer: D

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150. The slant height of a cone is fixed at 7 cm if the rate of increase of its height is 0.3 cm / sec then the rate of increase of its volume when its heights is 4 cm is

A. $\frac{\pi}{2}$ cm/sec

B. π cm/sec

C. $\frac{\pi}{5}$ cm/ sec

D. $\frac{\pi}{10}$ cm/sec

Answer: D

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151. If $S^2 = at^2 + 2bt + c$ then the acceleration is

A. directly proportional to s

B. inversely proportional to s

C. directly proportional to s^2

D. inversely proportional to s^3

Answer: D

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152. The value of 'c' in lagrange 's theorem for the function f(x)=log (sin x) in the interval $\left[\frac{\pi}{6}, \frac{5\pi}{6}\right]$ is

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

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

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

D. none of these

Answer: B

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153. A ladder 5 m long is leaning against a well. The bottom of the ladder is pulled along the ground, away from the well, at the rate of 2 m/s. How fat is its height on the wall decreasing when the foot of the ladder is 4m away from the wall?

A. $\frac{3}{8}$ m/sec

B. $\frac{8}{3}$ m/sec

C. $\frac{5}{3}$ m/sec

D. $\frac{2}{3}$ m/sec

Answer: B

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154. The angle between the curves $y^2 = 4ax$ and $ay = 2x^2$ is

A. $\frac{\tan^{-1} 3}{4}$

B. $\frac{\tan^{-1} 3}{5}$

C. $\frac{\tan^{-1} 4}{3}$

D. $\frac{\tan^{-1} 5}{3}$

Answer: B

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155. The maximum area in squre units of an isosceles triangle inscribed in an ellipse $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ with its vertex at one end of the major axis is

A. $\sqrt{3}ab$

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

C. $\frac{5\sqrt{3}}{4}$ ab

D. none of these

Answer: B

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156. $\in \frac{x^3-1}{x^3+x}dx =$

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

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

C. $x-\log x+\log(x^2+1)-\tan^{-1}x+c$

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

Answer: B

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157. If $\in \frac{\cos 8x + 1}{\tan 2x - \cot 2x} dx = a \cos 8x + c$ then a=

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

B. $\frac{1}{8}$

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

D. $-\frac{1}{8}$

Answer: C

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158. $\int x^{27} \cos \underset{-1}{\overset{1}{x}} + e^{x} dx =$

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

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

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

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

Answer: C

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159. The value of the integral $\int_{0}^{\pi} \frac{x \sin^{2n} x}{\sin^{2x} x + \cos^{2n} x}$ dx is

A. π^2

B. $2\pi^2$

C. $\frac{\pi^2}{4}$

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

Answer: C

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160. $\int_0^{\pi} x f(\sin x) dx = A \int_0^{\pi/2} f(\sin x) dx$ then A is

A. 0

B. 2π

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

D. π

Answer: D

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161. $\int_1^e \log x \, dx =$

A. 1

B. e-1

C. e+1

D. 0

Answer: A

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162. The area of the region bounded by the curves $y = x^2$ and $y = 4x - x^2$ in sq units is

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

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

C. $\frac{8}{3}$

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

Answer: C

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163. The area bounded by the curves y = cos x y = sin x between the ordinates x =0 and $x = \frac{3}{2}\pi$ is

A. $4\sqrt{2} - 2$

B. $4\sqrt{2} + 2$

C. $4\sqrt{2} - 1$

D. $4\sqrt{2} + 1$

Answer: A

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164. The area of the region enclosed by the curves y=x , x =e y=$\frac{1}{x}$ and the positive x axis is

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

B. 1 square unit

C. $\frac{3}{2}$ square units

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

Answer: C

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165. Let the straight line x =b divide the area enclosed by $y=(1-x)^2$ y=0 and x=0 in to parts $R_1(0 \leq x \leq b)$ and $R_2(b \leq x \leq 1)$ such that $R_1 - R_2 = \frac{1}{4}$ then b equals

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

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

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

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

Answer: B

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166. The differential equation of the family of parabolas $y^2 = 4ax$ where a is parameter is

A. $\frac{dy}{dx} = \frac{y}{2x}$

B. $\frac{dy}{dx} = -\frac{y}{2x}$

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

D. $\frac{dy}{dx} = \frac{2y}{x}$

Answer: A

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167. If $\frac{dy}{dx} = \frac{y + x\frac{\tan(y)}{x}}{x}$ then $\frac{\sin(y)}{x} =$

A. cx^2

B. cx

C. cx^3

D. log x

Answer: B

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168. The product of the degree and order of the D.E

$\left(\frac{d^2y}{dx^2}\right)^2 - \left(\frac{dy}{dx}\right)^3 = y^3$ is

A. 4

B. 6

C. 2

D. 3

Answer: A

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169. The general solution of the D.E

f$\frac{dy}{dx}+yg(x).\,g(x)$ where g(x) is a function of x is

A. g(x)+log(1+y+g(x))=0

B. g(x)+log(1+y-g(x))=0

C. g(x)-log(1+y-g(x))=0

D. g(x)-log(1-y+g(x))=0

Answer: B

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170. The directio ratios of the line which is perpendicular to the lines $\frac{x-7}{2}=\frac{y+17}{-3}=\frac{z-6}{1}$ and $\frac{x+5}{1}=\frac{y+3}{2}=\frac{z-4}{-2}$ are

A. $< 4, 5, 7 >$

B. $< 4, -5, 7 >$

C. $< 4, -5, -7 >$

D. $< -4, 5, 7 >$

Answer: A

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171. A line making anlges 45° and 60° with the positive direction of the axis of x and y makes with the positive direction of z axis angle of

A. 60°

B. 120°

C. 60° and 120°

D. none of these

Answer: C

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172. The shortest distance between the lines $\frac{x-3}{3}=\frac{y-8}{-1}=\frac{z-3}{1}$ 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: D

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173. Given two vectors $\hat{i} - \hat{j}$ and $\hat{i} + 2\hat{j}$ the unit vector coplanar with the two given vectors and perpendicular to $\left(\hat{i} - \hat{j}\right)$ is

A. $\dfrac{1}{\sqrt{2}}\left(\hat{i} + \hat{j}\right)$

B. $\dfrac{1}{\sqrt{5}}\left(2\hat{i} + \hat{j}\right)$

C. $\pm\dfrac{1}{\sqrt{2}}\left(\hat{i} + \hat{j}\right)$

D. none of these

Answer: A

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174. If $\vec{a}, \vec{b}, \vec{c}$ are three non zero vectors such that each one of then is perpendicular to the sum of the other two vectors then the value of $\left|\vec{a} + \vec{b} + \vec{c}\right|^2$ is

A. $\left|\vec{a}\right|^2+\left|\vec{b}+\right|^2+\left|\vec{c}\right|^2$

B. $\left|\vec{a}\right|+\left|\vec{b}+\right|+\left|\vec{c}\right|$

C. $2\left(\left|\vec{a}\right|^2+\left|\vec{b}+\right|^2+\left|\vec{c}\right|^2\right)$

D. $\frac{1}{2}\left(\left|\vec{a}\right|^2+\left|\vec{b}+\right|^2+\left|\vec{c}\right|^2\right)$

Answer: A

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175. If the vectors $a\hat{i}+\hat{j}+\hat{k}, \hat{i}+b\hat{j}+\hat{k}$ and $\hat{i}+\hat{j}+c\hat{k}$ are coplanar $(a\neq b\neq c\neq 1)$, then the value of $abc-(a+b+c)=$

A. 2

B. 0

C. -1

D. -2

Answer: D

Watch Video Solution

176. Let $\vec{a}, \vec{b}, \vec{c}$ be three non zero vectors which are pair wise non collinear and $\vec{a} + \vec{3}b$ is colinear with $\vec{c}$ and $\vec{b} + \vec{2}c$ is colinear with $\vec{a}$ then $\vec{a} + 3b + 6\vec{c}$ is

A. $\vec{a}$

B. $\vec{b}$

C. $\vec{0}$

D. $\vec{a} + \vec{c}$

Answer: C

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177. Let $\vec{a}$ and $\vec{b}$ be two unit vectors if the vectors $\vec{c} = \hat{a} + \hat{2}b$ and $\vec{d} = 5\hat{a} - 4\hat{b}$ are perpendicular to each other then the angle between $\hat{a}$ and $\hat{b}$ is

A. $\frac{\pi}{6}$

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

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

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

Answer: C

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178. Let ABCD be a parallelogram such that and $\angle BAD$ be an acute angle if $\vec{r}$ is the vector that coincides with the altitude directed from the vertex B to the side AD then $\overrightarrow{r}$ is given by

A. $\overrightarrow{r} = 3\overrightarrow{q} - \dfrac{3\left(\overrightarrow{p}.\overrightarrow{q}\right)}{\left(\overrightarrow{p}.\overrightarrow{p}\right)}\overrightarrow{p}$

B. $\overrightarrow{r} = -\overrightarrow{q} + \dfrac{\left(\overrightarrow{p}.\overrightarrow{q}\right)}{\left(\overrightarrow{p}.\overrightarrow{p}\right)}\overrightarrow{p}$

C. $\overrightarrow{r} = \overrightarrow{q} - \dfrac{\left(\overrightarrow{p}.\overrightarrow{q}\right)}{\left(\overrightarrow{p}.\overrightarrow{p}\right)}\overrightarrow{p}$

D. $\overrightarrow{r} = -3\overrightarrow{q} + \dfrac{3\left(\overrightarrow{p}.\overrightarrow{q}\right)}{\left(\overrightarrow{p}.\overrightarrow{p}\right)}\overrightarrow{p}$

Answer: B

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179. Three numbers are closen at random without replcement from {1,2,3 ....8} the probability that their minimum is 3 given that their maximum is 6 is

A. $\frac{3}{8}$

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

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

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

Answer: B

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180. Four fair dice D_1, D_2, D_3 and D_4 each having six faces numbered 1,2,3,4,5 and 6 are rolled simultaneously the probability that D_4 shows a number appearing on one of D_1 and D_3 is

A. $\frac{91}{216}$

B. $\frac{108}{216}$

C. $\frac{125}{216}$

D. $\frac{127}{216}$

Answer: A

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Select Correct Answer

1. In a class of 60 students, 25 students play cricket and 20 students play tennis and 10 students play both the games, then the number of students who play neither is

A. 0

B. 35

C. 45

D. 25

Answer: A

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2. Define a relation R on A = {1,2,3,4} as xRy iff x divides y. Then R is

.

A. reflexive and transitive

B. reflexive and symmetric

C. symmetric and transitive

D. equivalence

Answer: D

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3. Let $f: N \to N$ defined by

$$f(n) = \begin{cases} \frac{n+1}{2} & \text{if n is odd} \\ \frac{n}{2} & \text{if n is even} \end{cases}$$ then f is

A. one - one nad onto

B. one- one but not onto

C. onto but not one- one

D. neither one -one nor onto.

Answer: B

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4. The group (Z+) has ....

A. exactly one subgroup

B. only two subgroups

C. no subgroup

D. infintely many subgrous

Answer: B

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5. the value of $\alpha(\neq 0)$ for which the function f(x) = 1+ ax is the inverse of itself is :

A. -2

B. 2

C. -1

D. 1

Answer: A

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6. if 3x =5 (mod) 7, then :

A. x=2 (mod 7)

B. x=3 (mod 7)

C. x=4 (mod 7)

D. None of these

Answer: B

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7. If f(x) e^x and g(x) = log e^x then which of the following is TRUE ?

A. $f(g(x)) \neq g\{f(x)\}$

B. $f\{g(x)\} = g\{f(x)\}$

C. $f\{g(x)\} + g\{(x)\} = 0$

D. $f\{g(x)\} - g\{f(x)\} = 1$

Answer: B

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8. the number of bijeective funtion from the set A to itself. It a contains 108 elements is :

A. 108

B. -108

C. $(108)^2$

D. 2^{108}

Answer: A

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9. If $1, \varepsilon, \varepsilon^2$ are the cube roots of unity then : $\frac{1}{1+2\varepsilon}+\frac{1}{2+\varepsilon}-\frac{1}{1+\varepsilon}$

A. 0

B. 1

C. ε

D. ε^2

Answer: A

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10. The modulus and amplitude of $\frac{1+2i}{1-(1-i)^2}$ are

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

B. $\sqrt{2}\frac{\pi}{6}$

C. $1, 0$

D. $\sqrt{3}, 0$

Answer: C

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11. Sachin and Rahul ttempted to solve a quadratic equation .Sachin made a mistake in writing down the constant term and ended up in roots (4,3) Rahul made a mistake in wrinting down coefficent of X to get roots (3,2) the correct roots of equation are :

A. $6, 1$

B. $4, 3$

C. $-6, \ -1$

D. $-4, \ -3$

Answer: A

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12. If the equation :

$x^2 + 2x + 3 = 0$ and $ax^2 + bx + c = 0 a, b, c \in R$

have a common root then a: b: c is :

A. $3 : 2 : 1$

B. $1 : 3 : 2$

C. $3 : 1 : 2$

D. $1:2:3$

Answer: D

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13. Let α and β the roots of equation $px^2+qx+\ =0$ $p\neq 0$ if p,q,r are in A.P and $\frac{1}{\alpha}+\frac{1}{\beta}=4$ then the value of $|\alpha-\beta|$ is :

A. $\frac{2\sqrt{17}}{9}$

B. $\frac{\sqrt{34}}{9}$

C. $\frac{2\sqrt{13}}{9}$

D. $\frac{\sqrt{61}}{9}$

Answer: C

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14. If the coeffcents of x^3 and x^4 in the expansion of $(1 + ax + bx^2)(1 - 2x)^{18}$ in powers of x and both zero then (a, b) is equal to

A. $\left(14, \frac{251}{3}\right)$

B. $\left(14, \frac{272}{3}\right)$

C. $\left(16, \frac{272}{3}\right)$

D. $\left(16, \frac{251}{3}\right)$

Answer: C

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15. If m is the A.M of two distinct real number l and n (l,n $>$ 1) and G_1, G_2 and G_3 are three geometric means between l and n, then $G_1^4 + 2G_2^4 + G_3^4$ equal :

A. $4l^2mn$

B. $4lm^2n$

C. $4lmn^2$

D. $4l^2m^2n^2$

Answer: B

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16. Let $P \equiv (-1, 0), Q \equiv (0, 0)$ and $R \equiv (3, 3\sqrt{3})$ be three points. The equation of the bisector of the angle PQR is

A. $\sqrt{3}x + y = 0$

B. $x + \sqrt{3y} = 0$

C. $\sqrt{3x} - y = 0$

D. $x-\sqrt{3}y=0$

Answer: B

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17. If the focii of $\frac{x^2}{16}+\frac{y^2}{4}=1$ and $\frac{x^2}{a^2}-\frac{y^2}{3}$=1 coincide, then value of a is

A. $\sqrt{3}$

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

C. 2

D. 3

Answer: D

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18. The mean of the data set somprising of 16 doeservatins is 16.If oen of the observation valued 16 is delected and three new observations valued 3,4 and 5 are added to the data then the mean of the resultant data is :

A. 16.8

B. 16

C. 15.8

D. 14

Answer: D

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19. If $\tan x = \frac{3}{4}, \pi < x < \frac{3\pi}{2}$, then the value of $\cos. \frac{x}{2}$ is

A. $\frac{3}{\sqrt{10}}$

B. $\frac{3}{\sqrt{10}}$

C. $-\frac{1}{\sqrt{10}}$

D. $\frac{1}{\sqrt{10}}$

Answer: C

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20. The logical equivalent proposition of $p \Rightarrow q$ is

A. $(pAq)v(pAq)$

B. $(p\forall q) \vee (q \Rightarrow p)$

C. $(p \Rightarrow q) \vee (q \Rightarrow p)$

D. $(p\forall q) \Rightarrow (p \vee q)$

Answer: C

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21. If $\sin^{-1}\left(x-\frac{x^2}{2}+\frac{x^3}{4}\ldots\right)+\cos^{-1}\left(x^2-\frac{x^4}{2}+\frac{x^6}{4}-\ldots\right)=\frac{\pi}{2}$ for $0<|x|<\sqrt{2}$ then x equals :

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

B. 1

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

D. -1

Answer: A

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22. $\cot^{1}\sqrt{\cos\alpha}-\tan^{-1}\sqrt{\cos\alpha}=x$ then sin x

A. $\dfrac{\tan^2(\alpha)}{2}$

B. $\dfrac{\cot^2(\alpha)}{2}$

C. $\tan\alpha$

D. $\dfrac{\cot(\alpha)}{2}$

Answer: D

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23. If$\cos^{-1}x-\dfrac{\cos^{-1}(y)}{2}=\alpha$ then $4x^2-4xy\cos\alpha+y^3$ is equzal to

A. 4

B. $2\sin^2\alpha$

C. $-4\sin^2\alpha$

D. $4\sin^2\alpha$

Answer: D

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24. If $0 < x < 1$ then :

A. $\dfrac{x}{\sqrt{1+x^2}}$

B. x

C. $x\sqrt{1+x^2}$

D. $\sqrt{1+x^2}$

Answer: B

View Text Solution

25. If a, b and c are in A.P., then the value of $\begin{vmatrix} x+2 & x+3 & x+a \\ x+4 & x+5 & x+b \\ x+6 & x+7 & x+c \end{vmatrix}$ is

A. $x-(a+b+c)$

B. $9x^2+q+b+c$

C. 0

D. $a+b+c$

Answer: A

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26. If $\begin{vmatrix} 2a & x_1 & y_1 \\ 2b & x_2 & y_2 \\ 2c & x_3 & y_3 \end{vmatrix} = \frac{abc}{2} \neq 0$, then the area of the triangle whose vertices are $\left(\frac{x_1}{a}, \frac{y_1}{a}\right), \left(\frac{x_2}{b}, \frac{y_2}{b}\right)$ and $\left(\frac{x_3}{c}, \frac{y_3}{c}\right)$

A. $\frac{1}{4}abc$

B. $\frac{1}{8}$abc

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

D. $\frac{1}{8}$

Answer: B

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27. The system of linear equation :

$x + y + z = 6, x + 2y + 3z = 10$ and $x + 2y + az = 6$ has no solutions when:

A. $a = 2, b \neq 3$

B. $a = 3, b \neq 10$

C. $b = 2, a = 3$

D. $b = 3, a \neq 10$

Answer: C

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28. If A is 3×4 matrix and B is a matrix such that A'B and BA' are both defined, then B is of the type

A. 3×4

B. 3×3

C. 4×4

D. 4×3

Answer: B

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29. The symmetric part of the matrix

$$A = \begin{bmatrix} 1 & 2 & 4 \\ 6 & 8 & 2 \\ 2 & -2 & 7 \end{bmatrix}$$ is

A. $\begin{pmatrix} 1 & 4 & 3 \\ 2 & 8 & 0 \\ 3 & 0 & 7 \end{pmatrix}$

B. $\begin{pmatrix} 1 & 4 & 3 \\ 4 & 8 & 0 \\ 3 & 0 & 7 \end{pmatrix}$

C. $\begin{pmatrix} 0 & 2 & 1 \\ 2 & 0 & 2 \\ 1 & 2 & 0 \end{pmatrix}$

D. $\begin{pmatrix} 0 & 2 & 1 \\ 2 & 0 & 2 \\ 1 & 2 & 0 \end{pmatrix}$

Answer: C

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30. If A is a matrix of order 3, such that

A (adj A) $= 10I$, then |adj A| $=$

A. 10

B. 101

C. 1

D. 100

Answer: A

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31. $\lim_{n \to p \text{ or } p} \frac{1^2 + 2^2 \ldots \ldots \ldots + n^2 (n)^{1/n}}{(n+1)(n+10)(n+10)} =$

A. 3

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

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

D. ∞

Answer: D

View Text Solution

32. $\lim_{x \to 0} \frac{1 - \cos x}{x^2}$

A. 2

B. 3

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

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

Answer: D

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33. The derivative of $\tan^{-1}\left[\frac{\sin x}{1+\cos x}\right] w.r.t$ $\tan^{-1}\left[\frac{\cos x}{1+\sin x}\right]$ is

A. 2

B. -1

C. 0

D. -2

Answer: B

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34. $\frac{d}{dx}\left[\cos^2\cot^{-1}\sqrt{\frac{2+x}{2-x}}\right]$ is :

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

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

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

D. $\frac{-3}{4}$

Answer: B

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35. If $f(x) = \frac{\sin^2 x}{1 + \cot x} + \frac{\cos^2}{1 + \tan x}$ then $f\left(\frac{\pi}{4}\right)$ is

A. $\sqrt{3}$

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

C. 0

D. $-\sqrt{3}$

Answer: A

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36. if $\cos^{-1}\left(\frac{y}{b}\right) = n\log\left(\frac{x}{n}\right)$, then

A. $y_1 = x\sqrt{b^2 - y^2} = 0$

B. $xy_1 - \sqrt{b^2 - y^2} = 0$

C. $xy_1 = n\sqrt{b^2 - y^2}$

D. $xy_1 + n\sqrt{b^2 - y^2} = 0$

Answer: D

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37. $f(x) = 2a - x$ in $-a < x < a = 3x - 2a$ in $a \le x$. Then which of the following is true ?

A. f(x) is not differentiable at x= a

B. f(x) is continous at x=a

C. f(x) is continuous for all $x \leq a$

D. f(x) is differentiable for all x $\leq$ a

Answer: D

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38. If for the curve y=1 + $x^2$the tangent at $(1, -2)$ is parallel to x-axis then b=

A. 2

B. -2

C. 1

D. -1

Answer: D

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39. The slopes of the tangent normal at (0.1) for the curve y= sin sin x =e^x are respectively

A. 1 and -1

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

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

D. -1 and 1

Answer: B

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40. A stone is thrown vertically upwards and the height x ft, reached by the stone in t seconds is given by $x = 80t - 16t^2$. The stone reaches the maximum height in

A. 2 secs

B. 2.5 secs

C. 3secs

D. 3.5 secs

Answer: C

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41. If $\sin^{-1}$ a is the acture angle between the curves $x^2 + y^2 = 4x$ and $x^2 + y^2 = 8$ at (2,2), then a=

A. 1

B. 0

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

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

Answer: B

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42. If linear function $f(x)$ and $g(x)$ satisfy $\int[(3x-1)\cos x+(1-2x)\sin x]dx=f(x)\cos x+g(x)\sin x+C$, then

A. f(x) = 3x-5

B. g(x) =3+x

C. f(x) =3 (x-1)

D. g(x) =3(x-1)

Answer: A

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43. $\int \frac{\sin 2x}{\sin^2 x + 2\cos^2 x} dx =$

A. $\log(1 + \cos^2 x) + c$

B. $\log(1 + \tan^2 x) + c$

C. $-\log(1 + \sin^2 x) + C$

D. $-\log(1 + \cos^2 x) + c$

Answer: B

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44. $\int \frac{x^2+1}{x^4+1} dx =$

A. $\frac{1}{\sqrt{2}} \log_e (x^2) + C$

B. $-\frac{1}{\sqrt{2}} \tan^{-1}\left(\frac{x^2-1}{x\sqrt{2}}\right) + c$

C. $-\frac{1}{\sqrt{2}} \tan^{-1}(x^{2-1} + C$

D. $\frac{1}{\sqrt{2}} \frac{\tan^{-1}(x^2-1)}{\sqrt{2}} + C$

Answer: A

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45. $\int_0^1 x(1-x)^{3/2} dx =$

A. $-\frac{8}{35}$

B. $\frac{24}{35}$

C. $\frac{4}{35}$

D. $\frac{2}{35}$

Answer: C

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46. $\int_0^{\pi/4} \frac{\sin x + \cos x}{3 + \sin 2x} dx =$

A. 2 log 3

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

C. log 3

D. $\frac{1}{4}\log 3.$

Answer: B

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47. If the are between y $= mx^2$ and x= $my^2 (m > 0)$ is $\frac{1}{4} sq.$ Unit then the value of m is:

A. $\pm 3\sqrt{2}$

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

C. $\sqrt{2}$

D. $\sqrt{3}$

Answer: B

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48. The order and degree of the differential equation :

$$\left[1 + \left(\frac{dy}{dx}\right)^5\right]^{\frac{1}{3}} = \frac{d^2y}{dx^2}$$

A. $1, 3$

B. $2, 3$

C. 2,1

D. $1, 2$

Answer: B

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49. The general solution of the differential equation $\frac{dy}{dx} + \frac{y}{x} = 3x$ is

A. $y = x + \frac{c}{x}$

B. $y = x^2 + \frac{c}{x}$

C. $y = x\frac{c}{x}$

D. $y = x^2\frac{c}{x}$

Answer: D

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50. The angle between two diagonals of a cube is

A. 30°

B. 45°

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

D. $\cos^{-1}\left(\frac{1}{\sqrt{5}}\right)$

Answer: D

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51. Lines $\frac{x-2}{1}=\frac{y-3}{1}=\frac{z-4}{-K}$ and $\frac{x-1}{K}=\frac{y-4}{2}=\frac{z-5}{1}$ are coplanar if

A. k=0

B. k=-1

C. k=2

D. k=3

Answer: D

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52. Equatin of line passing through the point (2,3,1) and parallel to the line of intersection of the planes x−2y−z+6=0 and x+y+3z=5 is

A. $\dfrac{x-2}{5}=\dfrac{y-3}{4}=\dfrac{z-1}{3}$

B. $\dfrac{x-2}{5}=\dfrac{y-3}{4}=\dfrac{z-1}{3}$

C. $\dfrac{x-2}{-5}=\dfrac{y-3}{-4}=\dfrac{z-1}{3}$

D. $\dfrac{x-2}{4}=\dfrac{y-3}{3}=\dfrac{z-1}{2}$

Answer: C

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53. Let $\overrightarrow{a}=\hat{i}-2\hat{j}+3\hat{k}$. If $\overrightarrow{b}$ is a vector such that $\overrightarrow{a}.\overrightarrow{b}=\left|\overrightarrow{b}\right|^2$ and $\left|\overrightarrow{a}-\overrightarrow{b}\right|$ and $\left|\overrightarrow{a}-\overrightarrow{b}\right|=\sqrt{7}$, then $\left|\overrightarrow{b}\right|$ =

______

A. $\dfrac{15}{2}$

B. 15

C. $\dfrac{15}{2}$

D. $\frac{15\sqrt{3}}{2}$

Answer: C

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54. Let $\vec{a} = \hat{i} - 2\hat{j} + 3\hat{k}$. If $\vec{b}$ is a vector such that $\vec{a} . \vec{b} = \left|\vec{b}\right|^2$ and $\left|\vec{a} - \vec{b}\right|$ and $\left|\vec{a} - \vec{b}\right| = \sqrt{7}$, then $\left|\vec{b}\right|$ =

______

A. 7

B. 14

C. $\sqrt{7}$

D. 21

Answer: C

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55. If direction cosines of a vector of magnitude 3 are $\frac{2}{3}, -\frac{9}{3}, \frac{2}{3}$ and $a > 0$, then vector is ______

A. $2\hat{j} + \hat{j} + 2\hat{k}$

B. $2\hat{j} - \hat{j} + 2\widehat{k0}$

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

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

Answer: A

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56. If two dice are thrown simultaneously , then the probability that the sum of the numbers which come up on the dice to be more than 5 is ______

A. $\frac{5}{36}$

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

C. $\frac{5}{18}$

D. $\frac{13}{18}$

Answer: C

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57. A man takes a step forward with probability 0.4 and one step backward with probability 0.6 , then the probability that at the end of eleven steps he is one step away form the starting point , is

A. $.^{11}C_5 \times (0.48)^5$

B. $.^{11}C_6 \times (0.24)^5$

C. $.^{11}C_5 \times (0.12)^5$

D. $.^{11}C_6 \times (0.72)^6$

Answer: B

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58. The probability distribution of X is : $\begin{cases} X: & 0 & 1 & 2 & 3 \\ P(X) & 0.2 & k & k & 2k \end{cases}$

find the value of k.

A. 0.2

B. 0.3

C. 0.4

D. 0.1

Answer: C

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59. A box contains o red marbles number from 1 through 6 and 4 white marbles 12 through 15 .Find the probability that a marble drawn at random is white and old number :

A. 5

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

C. 6

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

Answer: C

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60. An urn contains nine balls of which three are ed four are blue two are green . Three balls are drawn at random without replacement from the urn the probability that the three balls have different colours is :

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

B. $\frac{2}{7}$

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

D. $\frac{2}{23}$

Answer: B

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