MATHS

BOOKS - KCET PREVIOUS YEAR PAPERS

MODEL TEST PAPER 10

Mathematics

1. If $\begin{bmatrix} x & 1 \\ -1 & -y \end{bmatrix} + \begin{bmatrix} y & 1 \\ 3 & x \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$, then (x,y) =

A. (1,0)

B. (1,1)

C. (0,1)

D. (2,1)

Answer: A

Watch Video Solution

2. The inverse of $\begin{bmatrix} -4 & 3 \\ 7 & -5 \end{bmatrix}$ is

A. $\begin{bmatrix} -5 & 3 \\ 7 & -4 \end{bmatrix}$

B. $\begin{bmatrix} 5 & 3 \\ 7 & 4 \end{bmatrix}$

C. $\begin{bmatrix} -5 & 7 \\ 3 & -4 \end{bmatrix}$

D. $\begin{bmatrix} -5 & -3 \\ -7 & -4 \end{bmatrix}$

Answer: B

Watch Video Solution

Watch Video Solution

3. The inverse of $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$ is

A. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 3 \end{bmatrix}$

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

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

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

Answer: D

Watch Video Solution

4. If A is a square matix then $\forall^T$ is

A. symmetric

B. skew-symmetric

C. a scalar matrix

D. a unit matrix .

Answer: A

Watch Video Solution

5. A unit vector parallel to the sum of the vectors $2i + 3j - k$ and $4i + 2j + k$ is

A. $\frac{6i+5j}{\sqrt{61}}$

B. $\frac{5i+6j}{\sqrt{61}}$

C. k

D. none of these

Answer: A

Watch Video Solution

6. The angle between the vectors $2i-3j+k$ and $4i+j-2k$ is given by

A. $\cos\theta=\frac{\sqrt{6}}{41}$

B. $\cos\theta=\frac{\sqrt{6}}{14}$

C. $\cos\theta\sqrt{\frac{6}{41}}$

D. none of these

Answer: B

Watch Video Solution

7. If $4i + j - k$ and $3i + mj + 2k$ are right angles then m=

A. -6

B. -8

C. -10

D. -12

Answer: C

Watch Video Solution

8. The work done by the force F=2i-3j+2k in moving a particle from (3,4,5) to (1,2,3) is

A. 0

B. $3/2$

C. -4

D. -2

Answer: D

Watch Video Solution

9. The area pf the triangle whose two sides are given by 4i - j + k and 3i+j - k is

A. $7\sqrt{2}$

B. $14\sqrt{2}$

C. $\frac{14}{\sqrt{12}}$

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

Answer: D

Watch Video Solution

10. A unit vector perpendicular to 3i + j +2 k and 2i-j + k is

A. $\frac{3i - j - 5k}{\sqrt{35}}$

B. $\frac{3i + j - 5k}{\sqrt{35}}$

C. $\frac{-3i + j + 5k}{\sqrt{35}}$

D. $\frac{3i + j + 5k}{\sqrt{35}}$

Answer: B

Watch Video Solution

11. $\tan 100^\circ + \tan 125^\circ + \tan 100^\circ \tan 125^\circ =$

A. $\sqrt{3}$

B. -1

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

D. 1

Answer: D

Watch Video Solution

12. If $\tan A = \frac{1}{3}$ and $\tan B = \frac{2}{7}$, then $\cot(A - B) =$

A. 23

B. 32

C. $1/23$

D. $1/32$

Answer: A

Watch Video Solution

13. If $\frac{\cos A}{a} = \frac{\cos B}{b} = \frac{\cos C}{c}$ then the ΔABC is

A. isosceles

B. right angled

C. equilateral

D. no conclusion .

Answer: C

Watch Video Solution

14. The anmplitude of $\frac{1+\sqrt{3}i}{\sqrt{3}+i}$ is

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

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

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

D. $-\frac{\pi}{6}$

Answer: C

Watch Video Solution

15. $\left|\frac{1}{(2+i)^2}-\frac{1}{(2-i)^2}\right|=$

A. $\frac{\sqrt{8}}{5}$

B. $\frac{25}{8}$

C. $\frac{5}{\sqrt{8}}$

D. $\frac{8}{25}$

Answer: D

Watch Video Solution

16. $(1+i)^4+(1-i)^4=$

A. 8

B. 4

C. -8

D. -4

Answer: C

Watch Video Solution

17. If $x_r = \cos. \frac{\pi}{2^r} + i \sin. \frac{\pi}{2^r}$, then $x_1 x_2 x_3 .... \infty =$

A. 0

B. 1

C. π

D. -1

Answer: D

Watch Video Solution

18. $\sin\left(2\cos^{-1}. \frac{3}{5}\right) =$

A. $\frac{2\sqrt{6}}{5}$

B. $\frac{4}{5}$

C. $\frac{24}{25}$

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

Answer: C

Watch Video Solution

19. $\cos^{-1}\left(\frac{2}{\sqrt{5}}\right) + \tan^{-1}\left(\frac{1}{3}\right) =$

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

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

C. $\tan^{-1}\frac{2}{\sqrt{5}}$

D. $\tan^{-1}\frac{1}{7}$.

Answer: B

Watch Video Solution

20. The general solution of $\tan 3x = 1$ is

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

B. $\frac{n}{3}\pi + \frac{\pi}{12}$

C. $n\pi$

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

Answer: B

Watch Video Solution

21. If $\tan^{-1} 3 + \tan^{-1} x = \tan^{-1} 8$, then $x =$

A. 5

B. 3

C. $1/5$

D. $1/3$

Answer: C

Watch Video Solution

22. $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents two parallel straight lines if

A. $abc + 2fgh - af^2 - bg^2 - ch^2 = 0$

B. a+b=0

C. $h^2 = ab, af^2 = bg^2$

D. $h^2 = ab, af^2 + bg^2 = 0$

Answer: C

Watch Video Solution

23. The equation of the circle described on the line joining the points (-2, -1) and (3, 4) as diameter is

A. $x^2 + y^2 + x + 3y + 10 = 0$

B. $x^2 + y^2 - x + 3y + 10 = 0$

C. $x^2 + y^2 - x - 3y - 10 = 0$

D. $x^2 + y^2 + x + 3y - 10 = 0$

Answer: C

Watch Video Solution

24. The vertex of the parabola $y^2 = x + 4y + 3$ is

A. $(-7, 2)$

B. `(7,-2)

C. (7,2)

D. (-7,-2)

Answer: A

Watch Video Solution

25. t_1 and t_2 are the parameters of the end-points f a focal chord of a parabola. Then

A. $t_1 + t_2 = -1$

B. $t_1 t_2 = -1$

C. $t_1 t_2 = 1$

D. $t_1 + t_2 = 1$

Answer: B

Watch Video Solution

26. In the ellipse $9x^2 + 5y^2 = 45$, the distance between the foci is

A. $4\sqrt{5}$

B. $3\sqrt{5}$

C. 3

D. 4.

Answer: D

Watch Video Solution

27. An ellipse slides between two straight lines at right angles to each other. The focus of its centre is part of

A. the auxiliary circle

B. the director circle

C. another ellipse

D. a parabola

Answer: C

Watch Video Solution

28. The eccentricity of the hyperbola $4x^2 - 9y^2 - 8x - 32 = 0$ is

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

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

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

D. $\frac{\sqrt{13}}{3}$

Answer: D

Watch Video Solution

29. The value of K so that y = 4x+ K may touch the hyperboal $\frac{x^2}{64} - \frac{y^2}{49} = 1$ is

A. $\sqrt{975}$

B. $\sqrt{875}$

C. $\sqrt{775}$

D. $\sqrt{675}$

Answer: A

Watch Video Solution

30. Which of the following is a prime number ?

A. 370261

B. 1003

C. 73271

D. 667

Answer: A

Watch Video Solution

31. The last digit of the number 11^{132} is

A. 1

B. 2

C. 4

D. 6

Answer: A

Watch Video Solution

32. $p \equiv q$(mod m) if and only if

A. $\frac{p-q}{m}$

B. $\frac{m}{p-q}$

C. $\frac{m}{p}$

D. $\frac{m}{q}$

Answer: B

View Text Solution

33. The remainder obtained when $64 \times 65 \times 66$ is divided by 67 is

A. 60

B. 61

C. 62

D. 63

Answer: B

Watch Video Solution

34. The set of all integers is not a group under multiplication because

A. closure property fails

B. associative law does not hold

C. there is no identity element

D. there is no inverse

Answer: D

Watch Video Solution

35. In a group $(G, *)$ for some element a of G , $a^2 = e$, where e is the indentity element . Then

A. $a = \sqrt{e}$

B. $a = a^{-1}$

C. $a = e$

D. none of these

Answer: B

Watch Video Solution

36. Define $*$ on the set of real number by $a * b = 1 + ab$. Then the operation * is

A. commutative but not associative

B. associative but not commutative

C. neither commutative nor associative .

D. both commutative and associative .

Answer: A

Watch Video Solution

37. $\int \frac{\log(x^2)}{x} dx =$

A. $(\log x)^2$

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

C. $\log(x^2)$

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

Answer: A

Watch Video Solution

38. $\int \frac{\sin x}{\sqrt{4-\cos^2 x}} dx =$

A. $\sin^{-1}\left(\frac{\cos x}{2}\right)$

B. $\frac{1}{2}\sin^{-1}\left(\frac{\cos x}{2}\right)$

C. $-\frac{1}{2}\sin^{-1}\left(\frac{\cos x}{2}\right)$

D. $-\sin^{-1}\left(\frac{\cos x}{2}\right)$

Answer: D

Watch Video Solution

39. $\int \frac{x^3+x^2+1}{x+1}dx =$

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

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

C. $\frac{x^4}{4}+\frac{x^3}{3}+\log(x)$

D. none of these

Answer: B

Watch Video Solution

Watch Video Solution

40. $\int \frac{dx}{x+\sqrt{x}} =$

A. $\log\left(1+\sqrt{x}\right)$

B. $\frac{1}{2}\log\left(x+\sqrt{x}\right)$

C. $2\log\left(1+\sqrt{x}\right)$

D. $\frac{2}{2}+\frac{2}{3}x^{3/2}$.

Answer: C

Watch Video Solution

41. $\int_{\pi/4}^{\pi/2} \cot x dx =$

A. $\log 2$

B. $\log \sqrt{2}$

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

D. $2\log 2$

Answer: B

Watch Video Solution

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

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

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

C. π

D. 1

Answer: B

Watch Video Solution

43. $\int_1^3 (x-1)(x-2)(x-3)dx =$

A. 3

B. 2

C. 1

D. 0

Answer: D

Watch Video Solution

Watch Video Solution

44. The area enclosed between the x-axis and one arch or the curve $y = \sin x$ is

A. 1

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

C. 2

D. π

Answer: C

Watch Video Solution

45.

$$\underset{n \to \infty}{\text{Lt}} \left(\frac{1}{n} + \frac{1}{\sqrt{n^2-1}} + \frac{1}{\sqrt{n^2-4}} + \ldots \text{to n terms} \right) =$$

A. π

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

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

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

Answer: B

Watch Video Solution

46. $\begin{vmatrix} 11 & 12 & 13 \\ 12 & 13 & 14 \\ 13 & 14 & 15 \end{vmatrix} =$

A. 1

B. 0

C. -1

D. 67

Answer: B

Watch Video Solution

47. $\begin{vmatrix} x & 4 & y+z \\ y & 4 & z+x \\ z & 4 & x+y \end{vmatrix} =$

A. 4

B. $x+y+z$

C. xyz

D. 0

Answer: D

Watch Video Solution

48. A root of the equation $\begin{vmatrix} 0 & x-a & x-b \\ x+a & 0 & x-c \\ x+b & x+c & 0 \end{vmatrix} = 0$ is

A. a

B. b

C. 0

D. 1

Answer: C

Watch Video Solution

49. If $f(x) = \frac{1}{1-x}$ then f[f{f(x)}]=

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

B. x

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

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

Answer: B

Watch Video Solution

50. The domain of the function

$y = \sqrt{x-2} + \sqrt{1-x}$ is

A. $x > 2$

B. $x < 1$

C. null set

D. the set of all real numbers .

Answer: C

Watch Video Solution

51. If $x^m y^n = (x+y)^{m+n}$, then $\frac{dy}{dx} =$

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

B. $\frac{x}{y}$

C. $\frac{m}{n}$

D. $\frac{n}{m}$.

Answer: A

Watch Video Solution

52. If $y = \sqrt{x + \sqrt{x + \sqrt{x + ...\infty}}}$ $\frac{dy}{dx} =$

A. $\frac{x}{2y - 1}$

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

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

D. $\frac{1}{2y + x}$

Answer: B

Watch Video Solution

53. If $y = a^x$, $\frac{d^2y}{dx^2} =$

A. $a^x (\log a)^2$

B. $a^{2x} (\log a)$

C. $a^x \log a$

D. none of these

Answer: A

Watch Video Solution

54. If $x^2 + xy + y^2 = 0$, $\frac{d^2y}{dx^2}$

A. 0

B. 1

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

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

Answer: A

Watch Video Solution

55. The length of the subtangent to the curve $x^2y^2 = a^4$ at the point (-a,a) is

A. 3a

B. 2a

C. a

D. 4a .

Answer: C

Watch Video Solution

56. The length of the subnormal to the curve $y^2 = x^3$ at the point $(4, 8)$ is

A. 24

B. $8/3$

C. $3/8$

D. 12 .

Answer: A

Watch Video Solution

57. The equation to the tangent to the curve $y = be^{x/a}$ at the point where $x = 0$ is

A. $\frac{x}{a} - \frac{y}{b} = 1$

B. $\frac{y}{b} - \frac{x}{a} = 1$

C. $\frac{x}{a} + \frac{y}{b} = 1$

D. $ax + by = ab$

Answer: B

Watch Video Solution

58. For all positive values of p,q,r and s

$$\frac{\left(p^2+p+1\right)\left(q^2+q+1\right)\left(r^2+r+1\right)\left(s^2+s+1\right)}{pqrs}$$

cannot be less than

A. 81

B. 91

C. 101

D. 111

Answer: A

Watch Video Solution

59. 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

B. 2.5

C. 3

D. 3.5

Answer: B

Watch Video Solution

60. The angle of intersection of the curves $x^2 + y^2 = 8$ and $x^2 = 2y$ at the point (2, 2) is

A. $\tan^{-1}\frac{1}{2}$

B. $\tan^{-1} 2$

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

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

Answer: D

Watch Video Solution