INDIAN SCHOOL AL WADI AL KABIR

Class XII, Applied Mathematics Revision ***Worksheet- UNIT TEST***

30-05-2021

OBJECTIVE TYPE (1 Mark)

Q.1. 1. If A = $\begin{bmatrix} x & 0 & 1 \\ 4 & -1 & 4 \\ 0 & 1 & 0 \end{bmatrix}$ is a singular matrix, find x.

	A	1	**B**	-1	**C**	0	**D**	2

Q.2. If matrix $A = [1\ 2\ 3]$ then write AA', where A' is the transpose of A.

	A	$[1\ 4\ \ 9]$	**B**	$[14]$	**C**	$\begin{bmatrix} 1 \\ 4 \\ 9 \end{bmatrix}$	**D**	$\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 3 & 6 & 9 \end{bmatrix}$

Q.3. Find the value of x from the matrix equation. $\begin{bmatrix} 1 & 3 \\ 4 & 5 \end{bmatrix}\begin{bmatrix} x \\ 2 \end{bmatrix}=\begin{bmatrix} 5 \\ 6 \end{bmatrix}$

	A	0	**B**	1	*C*	-1	**D**	5

Q.4. A is a non-singular matrix of order 3 $and\ |A| = -4, then\ |adjA|$

	A	4	**B**	12	**C**	-16	**D**	16

Q.5. If $x\begin{bmatrix} 2 \\ 3 \end{bmatrix} + y\begin{bmatrix} -1 \\ 1 \end{bmatrix} = \begin{bmatrix} 10 \\ 5 \end{bmatrix}$ find the value $of\ x - y$.

	A	0	**B**	1	**C**	-1	**D**	7

Q6 If $y = (x^x + e^{x^2}), find\ \frac{dy}{dx}$

	A	$x^x + e^{x^2}2x$	**B**	$x^x + e^{x^2}$	**C**	$x^x(1 + logx) + 2xe^{x^2}$	**D**	$x^x logx + e^{x^2}$

Q7 If f(x) = $\begin{cases} x^2 + 3x, & x \le 1 \\ ax + 2, & x > 1 \end{cases}$ is differentiable at x= 1, then a=

	A	3	**B**	5	**C**	2	**D**	1

Q8	If each element of a second order determinant is either zero or one, how many matrices can be written such that the value of the determinant is positive?							
	A	1	**B**	2	**C**	3	**D**	4
Q9	$Second\ derivative\ of\ x^2 + logx$							
	A	$2 - \frac{1}{x^2}$	**B**	$\frac{1}{x^2}$	**C**	$2x + \frac{1}{x}$	**D**	$2 + \frac{1}{x^2}$
Q10	$If\ x^y = a^b, then\ \frac{dy}{dx}$							
	A	$\frac{y}{xlogx}$	**B**	$-\frac{y}{xlogx}$	**C**	$\frac{x}{ylogx}$	**D**	$-\frac{x}{ylogx}$
Q11	$The\ derivative\ of\ e^x + e^{2x} + e^{3x}$ at x= 1							
	A	6e		$e + e^2 + e^3$	**C**	$e + 2e^2 + 3e^3$	**D**	3e
Q12	If x= t^4, y = t^2 + 2, then $\frac{dy}{dx}\ at\ t = 1$							
	A	0	**B**	1	**C**	$\frac{1}{2}$	**D**	$\frac{2}{3}$
Q13	If $y = \frac{x^2}{logx}, then\ \frac{dy}{dx}$							
	A	$\frac{x(2logx - 1)}{(logx)^2}$	**B**	$\frac{x(2logx + 1)}{(logx)^2}$	**C**	$\frac{x(2logx - x)}{(logx)^2}$	**D**	$\frac{x(2logx + x)}{(logx)^2}$
Q14	If A is a matrix of order 2x4 and B is a matrix of 4x3 then							
	A	AB is a matrix of order 2x3	**B**	BA is a matrix of order 3x2	**C**	AB = BA	**D**	None of these
Q15	$A = \begin{pmatrix} 7 & 14 \\ 2 & 4 \end{pmatrix}$, then A^{-1}							
	A	$\begin{pmatrix} 4 & -14 \\ -2 & 7 \end{pmatrix}$	**B**	$\begin{pmatrix} 7 & -2 \\ -14 & 4 \end{pmatrix}$	**C**	$\begin{pmatrix} 4 & -2 \\ -14 & 7 \end{pmatrix}$	**D**	*does not exist*

Q16.	On her birth day, Seema decided to donate some money to children of an orphanage home. If there were 8 children less, everyone would have got ₹10 more. However, if there were 16 children more, everyone would have got ₹ 10 less. Let the number of children be x and the amount distributed by Seema for one child be y (in ₹) Based on the information given above, answer the following questions:							
(i)	The equations in terms x and y are							
	A	5x-4y = 40, 5x-8y = -80	**B**	5x-4y = 40, 5x-8y = 80	**C**	5x-4y = 40 5x+8 y= -8	**D**	5x+4y = 40 5x-8y = -8
(ii)	The number of children who were given some money by Seema, i							
	A	30	**B**	40	**C**	23	**D**	32
(iii)	How much amount is given to each child by Seema?							
	A	32	**B**	30	**C**	60	**D**	26
(iv)	How much amount Seema spends in distributing the money to all the students of the Orphanage?							
	A	₹609	**B**	₹690	**C**	₹960	**D**	₹906
Q17	The area of triangle whose vertices are (1, -1), (-4, 6) and (-3, -5) = ...Sq. units							
	A	12	**B**	24	**C**	36	**D**	48
Q18.	A is a square matrix and $A^2 = I, then\ A^{-1}$							
	A	I	**C**	**0**	**C**	A	**D**	2A
Q19.	State TRUE or FALSE: Two matrices are equal if they are of the same order and their corresponding elements are equal							
Q20.	Which of the following is correct?							
	A	Matrix multiplication is commutative			**B**	Matrix addition is commutative		
	C	Matrix subtraction is commutative			**D**	All statements A, B and C are correct		

Q21.	$Solve\ for\ x\colon \begin{vmatrix} x & 4 & 1 \\ 4 & x & 8 \\ 5 & 5 & x \end{vmatrix} = 0$							
	A	$-9\ or\ 4\ or\ 5$	**B**	$9\ or\ -4\ or -5$	**C**	$9\ or\ 4\ or\ 5$	**D**	$-9\ or\ 4\ or\ -5$
Q22.	A matrix has 12 elements. Which of the following may be the order of the matrix?							
	A	6x6	**B**	4x8	**C**	12x12	**D**	12x1
Q23.	$\begin{vmatrix} -a^2 & ab & ac \\ ba & -b^2 & bc \\ ca & cb & -c^2 \end{vmatrix} =$							
	A	4abc	**B**	-4abc	**C**	$4a^2b^2c^2$	**D**	$-4a^2b^2c^2$
Q24.	Which of the following is correct?							
	A	Determinant is a square matrix	**B**	Determinant is a number associated to a matrix	**C**	Determinant is a number associated to a square matrix.	**D**	None of these
Q25	Which of the following is correct for the given system of linear equations? $3x - y - 2z = 2, 2y - z = -1\ \ 3x - 5y = 3$							
	A	Unique solution	**B**	No solution	**C**	Infinite solutions	**D**	None of these
Q26	The sum of three numbers is 6. If we multiply third number by 3 and add second number to it, we get 11. By adding first and third numbers, we get double of the second number. Represent these conditions using matrix algebra.							
Q27.	Write a $3 \times 3\ matrix\ such\ that\ A = [a_{ij}], such\ that\ a_{ij} = \frac{(i+j)^2}{2}$							
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Answers

Answers	1	A	2	B	3.	C	4	D
	5	D	6	C	7	B	8	C
	9	A	10	B	11	C	12	C
	13	A	14	A	15	D	16 (i)	A
	16 (ii)	D	16 (iii)	B	16 (iv)	C	17	B
	18	C	19	TRUE	20	B	21	A
	22	D	23	C	24	C	25	A
	26	$\begin{pmatrix} 1 & 1 & 1 \\ 0 & 1 & 3 \\ 1 & -2 & 1 \end{pmatrix}\begin{pmatrix} x \\ y \\ z \end{pmatrix} = \begin{pmatrix} 6 \\ 11 \\ 0 \end{pmatrix}$			27	$\begin{pmatrix} 2 & \frac{9}{2} & 8 \\ \frac{9}{2} & 8 & \frac{25}{2} \\ 8 & \frac{25}{2} & 18 \end{pmatrix}$		

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