MATHS
CLASSX
3. Algebra

Multiple choice questions

1. Which of the following are linear equation in three variables

(i) $2x = z$ (ii) $2\sin x + y\cos y + z\tan z = 2$

(iii) $x + 2y^2 + z = 3$ (iv) $x - y - z = 7$

(1) (i) and (iii) only (2) (i) and (iv) only (3) (iv) only (4) All

2. Graphically an infinite number of solutions represents

(1) three planes with no point in common
(2) three planes intersecting at a single point
(3) three planes intersecting in a line or coinciding with one another
(4) None

3. Which of the following is correct

(i) Every polynomial has finite number of multiples
(ii) LCM of two polynomials of degree 2 may be a constant
(iii) HCF of 2 polynomials may be a constant
(iv) Degree of HCF of two polynomials is always less then degree of LCM.

(1) (i) and (ii) (2) (iii) and (iv) (3) (iii) only (4) (iv) only

4. The HCF of two polynomials $p(x)$ and $q(x)$ is $2x(x+2)$ and LCM is $24x(x+2)^2(x-2)$. If $p(x) = 8x^3 + 32x^2 + 32x$ then $q(x)$ is equal to

(1) $4x^3 - 16x$ (2) $6x^3 - 24x$ (3) $12x^3 + 24x$ (4) $12x^3 - 24x$

5. Consider the following statements:

(i) The HCF of $x + y$ and $x^8 - y^8$ is $x + y$

(ii) The HCF of $x + y$ and $x^8 + y^8$ is $x + y$

(iii) The HCF of $x - y$ and $x^8 + y^8$ is $x - y$

(iv) The HCF of $x - y$ and $x^8 - y^8$ is $x - y$

Which of the statements given above are correct?

(1) (i) and (ii) (2) (ii) and (iii) (3) (i) and (iv) (4) (ii) and (iv)

6. For what set of values $\dfrac{x^2 + 5x + 6}{x^2 + 8x + 15}$ is undefined

(1) $-3, -5$ (2) -5 (3) $-2, -3, -5$ (4) $-2, -3$

7. $\frac{x^2+7x+12}{x^2+8x+15}\times\frac{x^2+5x}{x^2+6x+8}$ (L)

(1) $x+2$ (2) $\frac{x}{x+2}$ (3) $\frac{35x^2+60x}{48x^2+120}$ (4) $\frac{1}{x+2}$

8. If $\frac{p}{q}=a$ then $\frac{p^2+q^2}{p^2-q^2}$ is (M)

(1) $\frac{a^2+1}{a^2-1}$ (2) $\frac{1+a^2}{1-a^2}$ (3) $\frac{1-a^2}{1+a^2}$ (4) $\frac{a^2-1}{a^2+1}$

9. The square root of $4m^2-24m+36=0$ is (L)

(1) $4(m-3)$ (2) $2(m-3)$ (3) $(2m-3)^2$ (4) $(m-3)$

10. The real roots of the quadratic equation $x^2-x-1=0$ are (L)

(1) 1,1 (2) $-1,1$ (3) $\frac{1+\sqrt{5}}{2},\frac{1-\sqrt{5}}{2}$ (4) No real roots

11. The product of the sum and product of roots of equation $(a^2-b^2)x^2-(a+b)^2x+(a^3-b^3)=0$ is (M)

(1) $\frac{a^2+ab+b^2}{a-b}$ (2) $\frac{a+b}{a-b}$ (3) $\frac{a-b}{a+b}$ (4) $\frac{a-b}{a^2+ab+b^2}$

12. A quadratic polynomial whose one zero is 5 and sum of the zeroes is 0 is given by (M)

(1) x^2-25 (2) x^2-5 (3) x^2-5x (4) x^2-5x+5

13. Axis of symmetry in the term of vertical line separates parabola into (L)

(1) 3 equal halves (2) 5 equal halves
(3) 2 equal halves (4) 4 equal halves

14. The parabola $y=-3x^2$ is (L)

(1) Open upward (2) Open downward

(3) Open rightward (4) Open leftward

15. Choose the correct answer (L)

(i) Every scalar matrix is an identity matrix
(ii) Every identity matrix is a scalar matrix
(iii) Every diagonal matrix is an identity matrix
(iv) Every null matrix is a scalar matrix
(1) (i) and (iii) only (2) (iii) only (3) (iv) only (4) (ii) and (iv) only

16. If $2A+3B=\begin{bmatrix}2 & -1 & 4\\ 3 & 2 & 5\end{bmatrix}$ and $A+2B=\begin{bmatrix}5 & 0 & 3\\ 1 & 6 & 2\end{bmatrix}$ then B= (M)

(1) $\begin{bmatrix}8 & -1 & -2\\ -1 & 10 & -1\end{bmatrix}$ (2) $\begin{bmatrix}8 & -1 & 2\\ -1 & 10 & -1\end{bmatrix}$ (3) $\begin{bmatrix}8 & 1 & 2\\ 1 & 10 & 1\end{bmatrix}$ (4) $\begin{bmatrix}8 & 1 & 2\\ -1 & 10 & -1\end{bmatrix}$

17. If $(4 \quad 3 \quad 2)\begin{pmatrix}1\\ -2\\ x\end{pmatrix}=(6)$ then x is (L)

(1) 4 (2) 3 (3) 2 (4) 1

18. If $A=\begin{pmatrix}y & 0\\ 3 & 4\end{pmatrix}$ and $I=\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}$ then $A^2=16I$ for (H)

(1) $y=4$ (2) $y=5$ (3) $y=-4$ (4) $y=16$

19. If P and Q are matrices, then which of the following is true? (H)

(1) $PQ\neq QP$ (2) $\left(P^T\right)^T\neq P$ (3) $P+Q\neq Q+P$ (4) All are true

20. If $A=\begin{pmatrix}1 & 2\\ 3 & 4\\ 5 & 6\end{pmatrix}_{3\times2}, B=\begin{pmatrix}1 & 2 & 3\\ 4 & 5 & 6\end{pmatrix}_{2\times3}$ then which of the following products can be made from these matrices

(i) A^2 (ii) B^2 (iii) AB (iv) BA (H)

(1) (i) only (2) (ii) and (iii) only (3) (iii) and (iv) only (4) All the above