Practice Test Paper

Class XII | **Subject – Maths** | **M.M. 100**

Section – A

1. Let A = {3, 5} and B = {7, 11}. And R = {(a, b): a ∈ A and b ∈ B, a – b is odd}, then show that R is an empty relation.
2. Prove that $\sin\{\tan^{-1}(1)\} = \frac{1}{\sqrt{2}}$.
3. If A = $\begin{bmatrix} 1 & 4 & -1 \\ 2 & 6 & 5 \end{bmatrix}$ and B = $\begin{bmatrix} 3 & -2 & -6 \\ 2 & 0 & -7 \end{bmatrix}$ find A + B.
4. If A = $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ verify that $AA^{-1} = I$
5. Prove that (a + b + c) is a factor of : $\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix}$.
6. Evaluate : $\int x\, sec^2 x\ dx$.
7. Evaluate : $\int_0^1 \frac{2x}{1+x^2}\ dx$.
8. Find the unit vector in the direction of the vector: $\vec{a} = 2i + 3j + k$.
9. Find λ so that $\vec{a} \perp \vec{b}$, $\vec{a} = 2i + 3j + 4k$ & $\vec{b} = 3i + 2j - \lambda k$. A: 3
10. Find the magnitude of $\vec{a}\ X\ \vec{b}$, if $\vec{a} = 2i + j + k$ & $\vec{b} = i - 2j + k$. A: $\sqrt{35}$

Section – B

11. Prove that a relation **R** on the set **Z** of all integers defined by: (x, y) ∈ R ⇔ x – y is divisible by 4 is an equivalence relation on Z.
12. Solve : $tan^{-1}\left(\frac{1-x}{1+x}\right) - \frac{1}{2}\, tan^{-1}x = 0, \forall\ x > 0.$ A: $1/\sqrt{3}$
13. Show that x = 2 is a root of the equation: $\begin{vmatrix} x & -6 & -1 \\ 2 & -3x & x-3 \\ -3 & 2x & x+2 \end{vmatrix} = 0$, and solve it completely. A: -3,1,2
14. **The** function define d as : f(x) = $\begin{cases} x^2 + ax + b\ ; & 0 \le x < 2 \\ 3x + 2; & 2 \le x \le 4 \\ 2ax + 5b; & 4 < x \le 8. \end{cases}$ is continuous in [0,8] find 'a' and 'b'. **a=3 b=-2**
15. Find $\frac{dy}{dx}$ when: x = $e^{\theta}\left(\theta + \frac{1}{\theta}\right)$ and y = $e^{-\theta}\left(\theta - \frac{1}{\theta}\right)$.

16. Find a point on the curve y = $x^3 - 3x$, where the tangent is parallel to the chord joining the points (1, -2) and (2,2).

17. Evaluate : $\int \frac{sin2x}{sin5x \sin 3x}\, dx$. ***Or*** $\int (\frac{1}{\log x} - \frac{1}{(log x)^2})$dx .

18. If with reference to the right handed system of mutually perpendicular unit vectors $\hat{i}, \hat{j}, \hat{k}$, $\vec{\alpha} = 3\hat{i} - \hat{j}$, $\vec{\beta} = 2\hat{i} + \hat{j} - 3\hat{k}$, then express $\vec{\beta}$ in the form of $\vec{\beta} = \vec{\beta}_1 + \vec{\beta}_2$, where $\vec{\beta}_1$ is parallel to $\vec{\alpha}$ and $\vec{\beta}_2$ is perpendicular to $\vec{\alpha}$

19. If $y = \cot^{-1}\left(\frac{\sqrt{1+\sin x} + \sqrt{1-\sin x}}{\sqrt{1+\sin x} - \sqrt{1-\sin x}}\right)$, find $\frac{dy}{dx}$.

20. If $\tan^{-1} x + \tan^{-1} y + \tan^{-1} z = \pi$, show that $x + y + z = xyz$.

21. Show that a closed right circular cylinder of given total surface area and maximum volume is such that its height is equal to the diameter of its base.

22. Obtain the differential equation representing the family of parabolas having vertices at the origin and axis along the positive direction of X-axis. A: $y^2 - 2xyy'=0$

SECTION – C

23. Find the shortest distance between the lines $\frac{x+1}{7} = \frac{y+1}{-6} = \frac{z+1}{1}$ and $\frac{x-3}{1} = \frac{y-5}{-2} = \frac{z-7}{1}$

Or

Find the image of the point (3,5,3) in the line: $\frac{x}{1} = \frac{y-1}{2} = \frac{z-2}{3}$. A: (-1,1,7)

24. Find the area of the region $\{ (x, y) : x^2 \le y \le |x| \}$

25. Evaluate the integrals from the first Principal $\int_0^2 (3x^2 - 4)dx$

26. Solve the system of equation using matrix method 2x + 3y + 3z = 5, x – 2y + z = - 4, 3x –y – 2z = 3

27. Show that the height of the cylinder of maximum volume that can be inscribed in a sphere of radius r is $\frac{2r}{\sqrt{3}}$.

28. A Cooperative society of farmers has 50 hectares of land to grow two crops X and Y. The profit from crops X and Y per hectare are estimated as Rs 10,500 and Rs 9,000 respectively. To control weeds, a liquid herbicide has to be used for crops X and Y at rates of 20 liters and 10 liters per hectares. Further, not more than 800 liters of herbicide should be used in order to protect fish and wild life using a pond which collects drainage from this land. How much land should be allocated to each crop so as to maximize the total profit of the society?

29. A husband and a wife appeared for an interview for two posts. The probability of their selection is 1/7 and 1/5 respectively. What is the probability that:

(i) both of them will be selected A:1/35 (ii) only one of them will be selected A:2/7

(iii) at least of them will be selected A:11/35 (iv) none of them will be selected. A:24/35

Or

A discrete random variable X has mean score equal to '6' and variance equal to '2'. Assuming that the underline distribution is binomial, what is the probability when $5 \leq x \leq 6$. Ans:3136/6561

Practice Test Paper

Class XII **Subject – Maths** **M.M. 100**

General Instruction: As Per CBSE Sample Paper. **Section (A)**

1. If R →R defined as f(x) = $\frac{3x-2}{5}$ is an invertible function, find f^{-1}.
2. Evaluate : $\tan^{-1}1 + \sin^{-1}(-1/2)$.
3. A matrix of order 3 X 3 has determinant 7. What is the value of $|3A|$.
4. For what value of x the matrix $\begin{bmatrix} 6-x & x+2 \\ 2 & 4 \end{bmatrix}$ is a singular?
5. Give example of two non zero matrices such that their product is a zero matrix.
6. Differentiate w.r.t x: y = $2\sqrt{\boldsymbol{cotx^2}}$ **.**
7. Integrate : $\int \frac{x^2}{1+x^3}\, dx$.
8. Let $\vec{a} = 3$ and $|\vec{b}| = \frac{\sqrt{2}}{3}$ and $\vec{a}\, X \vec{b}$ is a unit vector. Find the angle between these vectors.
9. **Find a** vector of magnitude 5 unit and parallel to the resultant of the vectors $\vec{a} = 2\hat{\imath} + 3\hat{\jmath} - \hat{k}$ and $\vec{b} = \hat{\imath} - 2\hat{\jmath} + \hat{k}$.
10. Find the value of k for which the lines $\frac{x-1}{3} = \frac{y-2}{2k} = \frac{z-3}{2}$ and $\frac{x-1}{3k} = \frac{y-1}{1} = \frac{6-z}{5}$ are perpendicular to each other.

Section – B

11. Let f: N→R be a function defined as f(x) = $4x^2 + 12x + 15$. Show that it its invertible and find the inverse of f.

    OR Let * be a binary operation defined on N X N by (a,b) * (c,d) = (a+c, b+d). show that * is commutative and associative. Also find the identity element for * in N X N if any.
12. **Simplify :** $tan^{-1}\left(\frac{acosx-bsinx}{bcosx+asinx}\right)$ if $\frac{a}{b}tanx > -1$.
13. If a, b and c are real numbers and $\begin{vmatrix} b+c & c+a & a+b \\ c+a & a+b & b+c \\ a+b & b+c & c+a \end{vmatrix}$ = 0 show that either a + b + c = 0 or a = b = c.
14. If y = $x^{cotx} + (sinx)^x$ find $\frac{dy}{dx}$.

15. Let f(x) = $\begin{cases} \frac{1-\sin^3 x}{3\cos^2 x}, & if\ x < \frac{\pi}{2} \\ a, & if\ x = \frac{\pi}{2} \\ \frac{b(1-\sin x)}{(\pi-2x)^2}, & if\ x > \frac{\pi}{2} \end{cases}$ is continuous at x = $\frac{\pi}{2}$, find a and b.

OR

If y= $\frac{\sin^{-1}x}{\sqrt{1-x^2}}$ show that $(1-x^2)\frac{d^2y}{dx^2} - 3x\frac{dy}{dx} - y = 0.$

16. **Find** the intervals in which the function f(x) = sin3x , x ∈ $[0, \frac{\pi}{2}]$ is (i) Increasing (ii) decreasing

Or

Prove that the curves x = y^2 and xy = k cut at right angle if $8k^2 = 1$.

17. Evaluate the definite integral as limits of sum $\int_0^1 (x + e^x)dx.$

18. Find the particular solution, satisfying the given condition for the following Differential Equation:

$\frac{dy}{dx} - \frac{y}{x} + cosec\left(\frac{y}{x}\right) = 0, given\ y(1) = 0.$

19. Find the general solution of differential equation: y dx = (x + $2y^2$) dy.

20. Let $\vec{a} = 4\hat{\imath} + 5\hat{\jmath} - \hat{k}, \vec{b} = \hat{\imath} - 4\hat{\jmath} + 5\hat{k}\ and\ \vec{c} = 3\hat{\imath} + \hat{\jmath} - \hat{k}$. Find a vector $\hat{d}$ which is perpendicular to both $\vec{a} and \vec{b}$ such that $\vec{d}.\vec{c} = 21.$ Or

If $\vec{\alpha} = 3\hat{\imath} - \hat{\jmath}$, $\vec{\beta} = 2\hat{\imath} + \hat{\jmath} - 3\hat{k}$ then express $\vec{\beta}$ in form of $\vec{\beta_1} + \vec{\beta_2}$ where $\vec{\beta_1}$ is parallel to $\vec{\alpha}$ and $\vec{\beta_2}$ is perpendicular to $\vec{\alpha}$.

21. Find the coordinates of foot of perpendicular drawn from the point (3, -2, 1) to the plane 3x – y + 4z = 2.

22. In an examination, an examinee either guesses or copies or knows the answer to a multiple choice question with 4 choices. The probability that he makes a guess is 1/3 and that of copies is 1/6. The probability that his answer is correct, given that he copies is 1/8. Find the probability that he knew the answer to the question given that he answered it correctly.

Section – C

23. For A = $\begin{bmatrix} 1 & -1 & 1 \\ 2 & 1 & -3 \\ 1 & 1 & 1 \end{bmatrix}$, find A^{-1} and hence solve the equations: x + 2y + z = 4; -x +y + z = 0 and x – 3y +z = 2.

24. Find the equation of a plane passing through the point (-1, 3, 2) and perpendicular to each planes x + 2y + 3z = 5 and 3x+ 3y + z = 0.

25. A window is in the form of a rectangle surrounded by a semicircular opening. The total perimeter of the window is 10m. Find the dimensions of the window to admit maximum light through the whole opening.

Or

Show that the semi vertical angle of right circular cone of a given surface area and maximum volume is $sin^{-1}\left(\frac{1}{3}\right)$.

26. Evaluate: $\int_{\pi/6}^{\pi/3} \frac{sinx+cosx}{\sqrt{sin2x}}\, dx$ **Or** $\int_0^{\pi/2} log\ sinx\, dx.$

27. Prove that the curves $y^2 = 4x$ and $x^2 = 4y$ divide the area of the square bounded by $x = 0$, $x = 4$, $y = 4$ and $y = 0$ in 3 equal parts.

28. Two cards are drawn simultaneously (without replacing) from a well shuffled pack of 52 cards. Find the mean, variance and standard deviation of the number of kings.

29. A packet of plain biscuits costs `6 and that of chocolate biscuits costs ` 9. A housewife has ` 72 and wants to buy at least 3 packets of plain biscuits and 4 packets of chocolate biscuits. How many of each type should she buy so that she can purchase maximum number of packets? Form a LPP& solve this problem graphically.

Practice Test Paper

Class XII **Subject – Maths** **M.M. 100**

General Instruction: As Per CBSE Sample Paper. **Section (A)**

1. Let A ={1,2,3} , B = {4,5,6,7} and let f = {(1,4),(2,5),(3,6)} be a function from A to B. state whether f^{-1} exists or not. Justify your answer.
2. What is the principal value of $tan^{-1}\left(tan\frac{3\pi}{4}\right) + cos^{-1}(\frac{-1}{\sqrt{2}})$.
3. Find x if, $\begin{vmatrix} 4x+1 & 3 \\ 2x+1 & 1 \end{vmatrix} = \begin{vmatrix} 5 & 3 \\ -3 & 1 \end{vmatrix}$.
4. Find the sum of the cofactor of element a_{23} and the minor of the element a_{32} in the determinant $\begin{vmatrix} 2 & 3 & 5 \\ 6 & 0 & 4 \\ 1 & -5 & -7 \end{vmatrix}$.
5. A is a square matrix of order 3 and $|adjA| = 64, find\ |A|$.
6. Evaluate : $\int \frac{dx}{\sqrt{9-25x^2}}$.
7. Find k if $\int_0^1 (3x^2 + 2x + k)dx = 0$.
8. Find the direction cosines of the line through the points A(2,4,-5) and B(-1,2,3).
9. If $\vec{a} = 5\hat{\imath} - \hat{\jmath} - 3\hat{k}$, $\vec{b} = \hat{\imath} + 3\hat{\jmath} - 5\hat{k}$, check whether $\vec{a} + \vec{b}$ is perpendicular to $\vec{a} - \vec{b}$.
10. Find the Cartesian equation of the line through the point A with position vector $\vec{a} = 5\hat{\imath} + \hat{\jmath} - 4\hat{k}$ and which is parallel to the vector $3\hat{\imath} + 2\hat{\jmath} - 8\hat{k}$.

Section – B

11. Let A =R – {2} , B = R – {1} , f: A→B defined by f(x) = $\frac{x-1}{x-2}$ show that f is bijective and hence find f^{-1}.
12. Solve for x: $\tan^{-1}(x-1) + \tan^{-1}(x) + \tan^{-1}(x+1) = \tan^{-1}3x$

Or

Change into simplest form: $\tan^{-1}\frac{\cos x}{1+\sin x}; -\frac{\pi}{2} < x < \frac{\pi}{2}$

13. Using properties of determinant solve the following for x. $\begin{vmatrix} x+4 & 2x & 2x \\ 2x & x+4 & 2x \\ 2x & 2x & x+4 \end{vmatrix} = 0$

14. If the function f(x) given by f(x) = $\begin{cases} 3ax + b \ \ if\ x < 1 \\ \frac{11}{2} \quad\quad\quad if\ x = 1 \\ 5ax - 2b\ if\ x > 1 \end{cases}$ is continuous at x =1, find the value of a and b.

Or

Differentiate $sin^{-1}(\frac{12sinx+5cosx}{13})$ with respect to x.

15. If x = a$(\theta + sin\theta), y = a(1 + cos\theta)$ prove that $\frac{d^2y}{dx^2} = -\frac{a}{y^2}$.

16. Find the intervals in which f(x) = 2 log(x – 2) – x^2 +4x + 1, (x>2) is increasing and decreasing.

Or

Find the coordinates of the points on the curve y = x^2 + 3x + 4, the tangent at which pass through origin.

17. Evaluate : $\int_1^4 [|x-1| + |x-2| + |x-4|]dx$.

18. Solve the differential equation : x $\frac{dy}{dx} + y = xlogx; x \neq 0$

19. Find the particular solution of the differential equation, $(1+e^{2x})$dy +$(1 + y^2)e^x$ dx = 0.

20. Find the vector projection of $\vec{b} + \vec{c}\ on\ \vec{a}$ where $\vec{a} = 2\hat{\imath} - 2\hat{\jmath} + \hat{k}$, $\vec{b} = \hat{\imath} + 2\hat{\jmath} - 2\hat{k}$ & $\vec{c} = 2\hat{\imath} - \hat{\jmath} + 4\hat{k}$.

21. Find the shortest distance between the following pairs of lines whose vector equations are given by

$\vec{r} = (\hat{\imath} + 2\hat{\jmath} + 3\hat{k}) + \mu(2\hat{\imath} + 3\hat{\jmath} + 4\hat{k})$ and $\vec{r} = (2\hat{\imath} + 4\hat{\jmath} + 5\hat{k}) + \omega(3\hat{\imath} + 4\hat{\jmath} + 5\hat{k})$

22. 12 cards, numbered from 1 to 12 are placed in a box, mixed up thoroughly and then a card is drawn at random from the box. If it is known that the number on the card drawn is more than 3 find the probability that it is an even number. **Or**

A die is thrown 6 times. If getting a number greater than 4 is a success what is the probability of getting (i) at least 5 success (ii) at most 5 success.

Section – C

23. Using matrix solve the following system of equations: 2x + y + 3z = 9 , x + 3y – z = 2; - 2x + y + z = 7.

24. Show that the volume of the largest cylinder that can be inscribed in a sphere of radius r is $\frac{1}{\sqrt{3}}$ times the volume of the sphere.

25. Evaluate : $\int_1^3 (x^2 - 3x)dx$ as the limit of sum. **Or** Evaluate : $\int \sqrt{\sec x - 1}\, dx$.

26. Find the area bounded by the curve x^2 = 4y and the straight line x = 4y – 2

27. Find the equation of the plane containing the line $\frac{x+1}{-3} = \frac{y-3}{2} = \frac{z+2}{1}$ and the point (0, 7, - 7) and show that the line $\frac{x}{1} = \frac{y-7}{-3} = \frac{z+7}{2}$ also lies in the plane.

Or

Find the coordinate of the foot of the perpendicular form the point (2, 3, 7) to the plane 3x – y – z = 7. Also find the image of the point in the plane.

28. There are 3 coins. One is two headed coin, another is a biased coin that comes up tail 25% of the times and the third is an unbiased coin. One of the coins is chosen at random and tossed, it shows head. What is the probability that the coin was not the two headed coin?

29. A factory makes two type of items A and B, made of plywood. One piece of item A require 5 minutes for cutting and 10 minutes for assembling. One piece of item B requires 8 minutes for cutting and 8 minutes for assembling. There are 3 hours and 20 minutes available for cutting and 4 hours for assembling. The profit on one piece of item A is ` 5 and that on item B is ` 6. How many piece of each type should the factory make so as to maximize profit? Makes it as an LPP and solve it graphically.

Practice Test Paper

Class XII **Subject – Maths** **M.M. 100**

General Instruction: As Per CBSE Sample Paper. **Section (A)**

1. Find the value of $cos^{-1}\left(cos\frac{2\pi}{3}\right) + sin^{-1}\left(sin\frac{2\pi}{3}\right)$.
2. If S = { a, b, c} then find the total number of binary operations on S.
3. If A is a square matrix of order 3 such that $|adjA| = 64, find\ |A|$.
4. For what value of x the matrix A = $\begin{bmatrix} 5-x & x+1 \\ 2 & 4 \end{bmatrix}$ has no inverse?
5. Evaluate $\begin{vmatrix} sin30° & cos60° \\ -sin60° & cos30° \end{vmatrix}$.
6. The radius of an air bubble is increasing at the rate of ½ cm/s. at what rate its volume is increasing?
7. Evaluate $\int \frac{e^{5logx} - e^{4logx}}{e^{3logx} - e^{2logx}}$ dx.
8. If $|\vec{a}| = 2$, $|\vec{b}| = 5$ and $|\vec{a} X \vec{b}| = 8$ find $\vec{a}.\vec{b}$
9. If the equation of the line AB is $\frac{x-3}{1} = \frac{y+2}{2} = \frac{z-5}{4}$, find the direction ratio of line parallel to AB.
10. Find a unit vector in the direction of vector $\vec{a} = 2\hat{\imath} - 3\hat{\jmath} + 6\hat{k}$.

Section – B

11. Show that the relation in the set A = { x : x ∈ $W, 0 \leq x \leq 12\}$ given by R = {(a, b) : (a – b) is a multiple of 4} is an equivalence relation.
12. Solve for x: $tan^{-1}\left(\frac{x-1}{x-2}\right) + tan^{-1}\left(\frac{x+1}{x+2}\right) = \frac{\pi}{4}, |x| < 1.$
13. If a, b, c are real number then show that either a + b + c = 0 or a = b = c if, $\begin{vmatrix} b+c & c+a & a+b \\ c+a & a+b & b+c \\ a+b & b+c & c+a \end{vmatrix} = 0.$
14. Discuss the continuity of the following function at x = 0 ; f(x) = $\begin{cases} \frac{x^4+2x^3+x^2}{tan^{-1}x}, & x \neq 0 \\ 0 & x = 0 \end{cases}$
15. If $x\sqrt{1+y} + y\sqrt{1+x} = 0$ then prove that $\frac{dy}{dx} = -\frac{1}{(1+x)^2}$

    Or

    If sin y = x sin(a + y), prove that $\frac{dy}{dx} = -\frac{sin^2(a+y)}{sina}$
16. Show that $\int_0^{\pi/2}(\sqrt{tanx} + \sqrt{\cot x})dx = \sqrt{2}\,\pi$

17. Evaluate:- $\int \frac{e^x}{\sqrt{5-4e^x-e^{2x}}}$ dx Or $\int \frac{1}{\cos(x-a)\cos(x-b)}dx$

18. Find the interval in which the function f given by f(x) = $\frac{4sinx-2x-xcosx}{2+cosx}$, $0\leq x \leq 2\pi$ is strictly (i) increasing (ii) decreasing

Or

Find the equation of tangent to the curve y = $\sqrt{5x-3}-2$ which is parallel to the line 4x – 2y + 3 = 0

19. Find the shortest distance between the lines $\frac{x-3}{1}=\frac{y-5}{-2}=\frac{z-7}{1}$ and $\frac{x+1}{7}=\frac{y+1}{-6}=\frac{z+1}{1}$.

20. If $\vec{a},\vec{b}$ and $\vec{c}$ are such that $\vec{a}+\vec{b}+\vec{c}=0$ and $|\vec{a}|$ = 3, $|\vec{b}|=5$ and $|\vec{c}|$ = 7, find the angle between $\vec{a}$ $and \vec{b}$.

21. A pair of dice is thrown 4 times. If getting a doublet is considered a success, find the probability distribution of number of successes.

22. Solve the differential equation:- $\left(1+e^{\frac{x}{y}}\right)$dx + $e^{\frac{x}{y}}$ (1-$\frac{x}{y}$)$dy=0$ Or $(tan^{-1}y-x)dy=(1+y^2)dx$

Section – C

23. using matrices solve the following system of linear equation:

2x – y + z = 3

2y – x – z = - 4

x – y + 2z = 1

24. show that the volume of the greatest right circular cylinder that can be inscribed in a right circular cone of height h and semi vertical angle α is $\frac{4}{27}\pi h^3 tan^2\alpha$. Or Show that the semi vertical angle of right circular cone of maximum volume and of given slant height is $tan^{-1}\sqrt{2}$.

25. Evaluate $\int_0^1 2\,tan^{-1}x^2 dx$

26. Find the area of that part of the circle x^2 + y^2 = 16 which is exterior to the parabola y^2 = 6x.

27. Find the equation of plane passing through the points (3, 4, 1) and (0, 1, 0) and parallel to the line $\frac{x+3}{2}=\frac{y-3}{7}=\frac{z-2}{5}$

Or

Find the distance of the point (- 2 , 3, -4) from the line $\frac{x+2}{3}=\frac{2y+3}{4}=\frac{3z+4}{5}$ measured parallel to the plane 4x + 12y – 3z + 1 = 0.

28. In a test, an examinee either guesses or copies or knows the answer to a multiple choice question with four choices. The probability that he makes a guess is 1/3 and the probability that he copies the answer is 1/6. The probability that his answer is correct, given that he copied it is 1/8. Find the probability that he knew the answer to the question, if he answered it correctly.

29. A diet for a sick person must contain at least 4000 units of vitamins, 50 units of mineral and 1400 units of calories. Two foods A and B are available at the cost of ` 5 and ` 4per unit respectively. One unit of food A contains 200 units of vitamins, 1 unit of mineral and 40 unit of calories. While one unit of food B contains 100, 2 and 40 units respectively. Find what combination of food A and food B should be used to have least cost, but must satisfy the requirements of sick person. Form a LPP and solve it graphically.

Practice Test Paper

Class XI   Subject – Maths   M.M. 100

General Instruction: As Per CBSE Sample Paper.   **Section (A)**

1. Write the set {2, 4, 8, 16, 32} in the set builder form.
2. Write down the power set of { }.
3. Find the radian measure of 240^0.
4. If sec x = 13/5, find the quadrant in which x can lie.
5. Find the value of cosec (- 1410^0).
6. Find the multiplicative inverse of 2 – 3i.
7. Convert 7 x 8 x 9 x 10 in factorial form.
8. Give an example of a sequence which is not a progression.
9. Does the point (- 2.5 , 3.5) lie inside, outside or on the circle $x^2 + y^2 = 25$?
10. Reduce the equation $\sqrt{3}$ x + y – 8 = 0 into normal form.

Section – B

11. Find the set A, B and C such that $A \cap B, B \cap C \,\&\, C \cap A$ are not empty set but $A \cap B \cap C = \emptyset$.
12. Define a relation R on the set N of natural numbers by R = { (x, y): y = x + 5 , x ,y $\epsilon N, x < 4\}$. Draw an arrow diagram of R. depict this relationship using roaster form. Write down the domain and range of R.
13. Find the domain and range of real function f(x) = $\sqrt{\mathbf{9 - x^2}}$.
14. Prove that cos4x = 1 – $8\sin^2x\cos^2x$.
15. Find the general solution of the equation sin 2x + cos x = 0.

    Or

    In any triangle ABC, the angles are in the ratio 1:2:3. Prove that the corresponding sides are in the ratio of 1 : $\sqrt{3}$: 2.
16. Convert the complex number (- 1 + i) in the polar form.
17. If $(x+ iy)^3$ = u + iv, then show that $\frac{u}{x} + \frac{v}{y} = 4(x^2 - y^2)$ **Or** Find the square root of (- 15 + 8i).
18. Find the number of arrangements of the letter of the word INDEPENDENCE. In how many of these arrangements, do the words begin with I and end with P.

    Or

Find the number of 4 digits numbers that can be formed using the digits 1, 2, 3, 4, 5 if no digit is repeated. How many of these will be even.

19. In an examination a question paper consists of 12 questions divided into two parts i.e. in Part I and in Part II, containing 5 and 7 questions respectively. A student is required to attempt 8 questions in all, selecting at least 3 from each part. In how many ways can a student select the questions?

20. If the 4^{th}, 7^{th} and 10^{th} term of a G.P. are x, y and z respectively prove that x, y and z are also in G.P.

21. If P is the length of the perpendicular form the origin to the line whose intercepts on the axes are 'a' and 'b' then show that $\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$.

Or

What are the points on y – axis whose distance from the line 4x + 3y = 12 is 4 units.

22. Find the ratio in which YZ plane divides the line segment joining the points (-2, 4, 7) and (3, -5, 8).

Section – C

23. in a survey of 25 students, it was found that 15 had taken Mathematics, 12 had taken Physics and 11 had taken Chemistry, 5 had taken both maths and chemistry, 9 had taken maths and physics, 4 had taken physics and chemistry and 3 had taken all the three subjects. Find the number of students that had taken

(1) only chemistry (2) Physics and chemistry but not maths.

24. Find sin $\frac{x}{2}$, $\cos\frac{x}{2}$ $and\ tan\frac{x}{2}$ if tan x = $-\frac{4}{3}$, it is known that x lies in II quadrant.

25. Using the principal of mathematical induction prove that 10^{2n-1} +1 is divisible by 11.

26. Solve the following system of inequalities graphically: x + 2y ≤ 8, 2x + y≤ 8 .

27. The coefficients of $(r-1)^{th}$, r^{th} and $(r+1)^{th}$ terms in the expansion of $(x + 1)^n$ are in the ratio 1 : 3 : 5, find 'n' and 'r'.

Or

Find a , b and n in the expansion of $(a + b)^n$ if the first three terms of the expansion are 729, 7290 and 30375 respectively.

28. In an AP if p^{th} term is 1/q, q^{th} term is 1/p, prove that the sum of its first pq terms is $\frac{1}{2}(pq+1)$, where $p \neq q$

Or

Find the sum to n terms of the series $1^2 + (1^2 + 2^2) + (1^2 + 2^2 + 3^2) + \ldots$

29. Find the coordinates of foci, vertices, the length of major and minor axes and the eccentricity of the ellipse $9x^2 + 4y^2 = 36$

Practice Test Paper

Class XI **Subject – Maths** **M.M. 100**

General Instruction: As Per CBSE Sample Paper. Section (A)

1. If $f(x) = x^3 + 1$ and $g(x) = x + 1$ be two real valued functions, find $2g^2 – 3f$.
2. Prove that : $(2n)! = 2^n . n![1.3.5...(2n – 1)]$.
3. Find the ratio in which the line segment joining the points (2, -1 ,4) and (2, 1, -5)is divided by XY – Plane.
4. Find the centre and radius of the circle $x^2 + y^2 – 4x + 6y = 12$.
5. Evaluate : $\lim_{x \to 0} \frac{\sqrt{2-x} - \sqrt{2+x}}{x}$.
6. Write the domain and range of f(x) = $\sqrt{9 - x^2}$.
7. if f(x) = $\frac{2-3cosx}{sinx}$, find $f'(\frac{\pi}{4})$.
8. Differentiate $x\sqrt{1-x}$ w.r.t x.
9. Write the component statement of following compound statement : " The school is closed, if there is a holiday or Sunday"
10. What is the eccentricity of the hyperbola whose vertices and foci are ($\pm 2, 0)$ and $(\pm 3, 0)$ respectively.

Section – B

11. A survey shows that 63% of the Americans like cheese and 76% like tea. If x% like both cheese and tea. Find the value of x.
12. Prove that $\sqrt{2 + \sqrt{2 + \sqrt{2 + 2cos8\alpha}}} = 2cos\alpha.$
13. Prove that : $\tan 80^0 = \tan 10^0 + 2 \tan 70^0$. **Or** tan 5A = tan 3A + tan 2A + tan 5A.tan3A.tan2A
14. How many terms of the series 54 + 51 + 48 + . . . must be taken to make the sum 513? Explain double answer.
15. The letters of the words 'RANDOM' are written in dictionary order in all possible ways. What is the rank of 'RANDOM'. **Or**

    If all letters of the word "AGAIN" be arranged in dictionary order, what is 50^{th} word?
16. If the coefficient of x, x^2 and x^3 in the binomial expansion of $(1 + x)^{2n}$ are in A.P., then prove that

    $2n^2 – 9n + 7 = 0$.
17. Find the points on X – axis whose distance from the line 4x + 3y – 12 = 0 is 8 units.

18. If y = x sinx, prove that $\frac{1}{y}.\frac{dy}{dx} - \frac{1}{x} = \cot x$. **Or**

Differentiate y = $\frac{sinx}{x}$ w.r.t. x using first principle.

19. For the distribution, ∑(x – 5) = 3 and $(x – 5)^2$ = 43, whose total number of items is 18. Find the mean and the standard deviation.

20. A, B and C are three mutually exclusive and exhaustive events associated with a random experiment. Find P(A), if P(B) = $\frac{3}{2}$ P(A) and 2P(C) = P(B).

21. The foci of a hyperbola coincide with the foci of ellipse $\frac{x^2}{25} + \frac{y^2}{9}$ = 1. Find the equation of the hyperbola if its eccentricity is 2. **Or**

Prove that, the product of the lengths of the perpendicular drawn from the point $(\pm\sqrt{a^2 - b^2}, 0)$ to the line $\frac{x}{a}cos\theta + \frac{y}{b}sin\theta$ = 1 is b^2.

22. Which term of the sequence 8 – 6i, 7 – 4i, 6 – 2i, . . . is (i) purely real (ii) Purely imaginary?

Section – C

23. Solve for 'x' ; 7 $\cos^2$x + 3 $\sin^2$x = 4.

24. Using the principle of Mathematical Induction, prove the following for n ∈ N.

 5 + 55 + 555 + … + n terms = $\frac{5}{81}(10^{n+1} - 9n - 10)$. **Or** $2.7^n + 3.5^n - 5$ is divisible by 24.

25. If (1 + 2i)(2 + 3i)(3 + 4i) = a + ib, prove that $a^2 + b^2$ = 1625.

26. The longest side of a triangle is three times the shortest side and the third side is 2cm shorter than the longest side. If the perimeter of the triangle is at least 61cm, find the minimum length of the shortest side.

27. Find the mean deviation from the mean for the following data:

C.I.	*0 – 10*	*10 – 20*	*20 – 30*	*30 – 40*	*40 – 50*
f	*5*	*8*	*15*	*16*	*6*

28. If A + B = $\frac{\pi}{4}$, show that (1 + tan A)(1 + tan B) = 2.

29. Find the distance of line x + 3y = 5 from point (2, -5) measured parallel to 2x – 3y = 1.

Or

Two consecutive sides of a parallelogram are 4x + 5y = 0 and 7x + 2y = 0. If the equation of its diagonal is 11x + 7y = 9, find the equation of other diagonal.

Practice Test Paper

Class XI **Subject – Maths** **M.M. 100**

General Instruction: As Per CBSE Sample Paper. **Section (A)**

1. If A = {1, 2, 3, 4} , B ={ 1, 3, 5, 7}, find a relation "is less than" from A to B.
2. Solve 5x – 3 < 3x + 1 when (i) x is an integer (ii) x is a real number.
3. Identity which of the following are statement? (i) Do your home work (ii) 2 + 5 < 11.
4. Write the negatives of the following statement: "sum of 2 and 3 is 6".
5. Find the component statements of the following: "All prime numbers are neither even nor odd."
6. Find the derivative of $\sin^2 x$, with respect to x.
7. Differentiate, $(ax + b)^n$, with respect to x.
8. The foci of an ellipse are $(\pm 5, 0)$ and eccentricity is $\frac{1}{2}$. Find the equation of the ellipse.
9. Find x, so that 2 is slope of the line through the points (2, 5) and (x, 3).
10. Two vertices of a triangle are (2, - 6, 4), (4, -2, 3) and its centroid is (8/3, -1, 3). Find the third vertex.

Section – B

11. Prove that: $2\cos\frac{\pi}{13}\cos\frac{9\pi}{13}+\cos\frac{3\pi}{13}+\cos\frac{5\pi}{13}=0.$
12. In a survey of 600 students in a school, 150 students were found to be taking tea and 225 taking coffee, 100 were found both tea and coffee. Find how many students were taking neither tea nor coffee?
13. Solve the following trigonometric equation : $\tan^2 x + (1 - \sqrt{3})\tan x - \sqrt{3} = 0.$
14. Draw the graph of signum function f: R→R defined by f(x) = $\begin{cases} 1 & if\ x > 0 \\ 0 & if\ x = 0 \\ -1 & if\ x < 0 \end{cases}$

    Or

    Draw the graph of greatest integer function.
15. Find the number of ways of selecting 9 balls from 6 red balls, 5 white balls and 5 blue balls, if each selection consists of 3 balls from each colour. **Or**

    In a room everybody shakes with everybody else. Find the total persons in a room, if total handshakes are 66.
16. If $\frac{b+c-a}{a}, \frac{c+a-b}{b}, \frac{a+b-c}{c}$ are in A.P., show that $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ are in A.P.

17. If $\frac{(a+i)^2}{2a-i} = p + iq$, show that $p^2 + q^2 = \frac{(a^2+1)^2}{4a^2+1}$.

Or

Represent the complex number $1 + \sqrt{3}\,i$ in polar form.

18. Prove that the diagonals of a parallelogram formed by the four straight lines : $\sqrt{3}x + y = 0, \sqrt{3}\,x + y = 1,$ $\sqrt{3}\,y + x = 0$ and $\sqrt{3}\,y + x = 1$ are at right angles to one another.

19. Evaluate : $\lim_{x \to \pi/6} \frac{2-\sqrt{3}cosx-sinx}{(6x-\pi)^2}$ **Or**

Given f(x) = $\begin{cases} \frac{x}{|x|}, & x \neq 0 \\ -1, & x = 0 \end{cases}$ Does $\lim_{x \to 0} f(x)$ exists?

20. Two unbiased dice are thrown. Find the probability that neither a doublet nor a total of 10 will appear.

21. A committee of two persons is selected form two men and two women, what is the probability that the committee will have one man.

22. Calculate Mean and Variance for the following distribution :

Classes	30 – 40	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90	90 – 100
Frequency	3	7	12	15	8	3	2

Section – C

23. If tan $(\alpha + \beta) = ntan(\alpha - \beta)$, show that (n+1) sin$2\beta = (n-1)sin2\alpha$.

24. If tan y = 3 tan x, prove that tan (x + y) = $\frac{2sin2y}{1+2cos2y}$

Or

If tan A = $\frac{m}{m-1}$ *and* $\tan B = \frac{1}{2m-1}$, show that tan (A + B) = $\frac{\pi}{4}$.

25. Using binomial theorem, prove that $6^n - 5n - 1$ is always divisible by 25.

26. Find n, if the ratio of the fifth term from the beginning to the fifth term from end in expansion of $\left(\sqrt[4]{2} + \frac{1}{\sqrt[4]{3}}\right)^n$ is $\sqrt{6} : 1$. **Or**

If the three consecutive coefficients in the expansion of $(1 + x)^n$ are in the ratio 6 : 33 : 110, find n and r.

27. Using principle of mathematical induction, prove that $10^{2n-1} + 1$ is divisible by 11, for all natural numbers.

28. A student wants to arrange 3 Mathematics, 4 Hindi and 5 physics books on a shelf. In how many ways books can be arranged? How many arrangements are possible if all the books on the same subject are to be together? Assume that books on the same subject are different.

29. Vertex of an equilateral triangle is (- 1, 2) and opposite side is x + y – 2 = 0. Find the equations of other sides.

Practice Test Paper

Class XI **Subject – Maths** **M.M. 100**

General Instruction: As Per CBSE Sample Paper. **Section (A)**

1. Find the domain and range of the function f(x) = $-|x|$.
2. If $z_1 = 4 + 7i$ and $z_2 = 1 - I$, find im($z_1.\overline{z_2}$).
3. Does the point (-5/2, 7/2) lies inside, outside or on the circle $x^2 + y^2 = 25$?
4. Find the distance between the lines 3x – 4y + 7 = 0 and 6x – 8y = 21.
5. If three consecutive vertices of a parallelogram are (3, 4, - 1), (7, 10, - 3) and (8, 1, 0). Find the coordinate of the fourth vertex.
6. Find $\lim_{x \to 0} f(x)$, where f(x) = $\begin{cases} x-2, & x<0 \\ 0, & x=0 \\ x+2, & x>0 \end{cases}$.
7. Evaluate : $\lim_{x \to 0} \frac{1-\cos 4x}{1-\cos 5x}$.
8. Write the component statement of the compound statement:
   "A point occupies a position and its location can be determined".
9. Write the negation of the statement: "Both the diagonals of a rectangle have the same length".
10. Rephrase the statement as conditional "if p than q",
    "Working hard ensure that you will pass the examination.

SECTION - B

11. Out of 500 TV owners investigated, 400 owned brand A , 200 owned brand B and 50 owned both the brands. Is this information correct?
12. Draw the graph of the function f(x) = $|x-2| + |x-3|$.
13. Let f{(1,1), (2,3), (0, -1),(-1,-3)} be a function from Z to Z, defined by f(x) = ax + b for some integers a and b. find a and b.
14. Show that for any sets A and B, A = $(A \cap B) \cup (A - B)$.
15. Prove by mathematical Induction Principle $11^{n+2} + 12^{2n+1}$ is divisible by 133, $\forall n \in N$.
16. Find the sum of odd integers from 1 to 2001.

17. Prove that there is no term involving x^5 in the expansion of $(2x^2 - \frac{3}{x})^{11}$.
18. Find the coordinates of a point equidistance from four points (0,0,0), (2,0,0), (0, -4, 0) and (0,0,6).
19. Differentiate, $\frac{sinx}{x}$ with respect to x, from first principle. **Or** Differentiate, $x^3\sqrt{2-x}$, w.r.t. x.
20. If E and F are the events such that P(E) = ¼ and P(F) = ½ and P(E and F)= 1/8. Find P (not E and not F).

Or

If 4 – digit numbers are to be formed greater than 5000 using the digits 0, 1, 3, 5 and 7, what is the probability of forming a number divisible by 5 when repetition of digits is (i) allowed (ii) not allowed.
21. Show that the perpendicular drawn from the point (4, 1) on the line joining the points (6, 5) and (-2, -1 divides the line segment in the ratio 8 : 5.
22. Find the mean and standard deviation for the following data:

C.I.	*0 – 10*	*10 – 20*	*20 – 30*	*30 – 40*	*40 – 50*	*50 – 60*	*60 – 70*
f	*3*	*6*	*13*	*15*	*10*	*4*	*9*

Section – C

23. Prove that, $cos\alpha + cos\beta + cos\gamma + \cos(\alpha+\beta+\gamma) = 4cos\frac{\alpha+\beta}{2}cos\frac{\beta+\gamma}{2}cos\frac{\gamma+\alpha}{2}$.
24. Solve : $2\cos^2 x + 3 \sin x = 0$.
25. If one geometric mean G and two arithmetic means p and q be inserted between two given numbers, prove that $G^2 = (2p - q)(2q - p)$. **Or**

The piece of a cloth costs `35. If piece were 4 m longer and each meter costs Re. 1 less, the cost would remain unchanged. Find the length of piece.
26. Solve graphically : $3y - 2x \le 4, x + 3y > 3, x + y \ge 5, y < 4$.
27. How many five letter words (may or may have not any meaning) can be formed from the letters of the word “EQUATION”? How many of these will have 3 vowels and 2 constants.
28. The pth and qth terms of an A.P. are x and y respectively. Prove that sum of (p + q) terms is $\frac{p+q}{2}\left[x + y + \frac{x-y}{p-q}\right]$. **Or**

If G_1 and G_2 are two G.M’s between b and c and a their A.M., than show that $G_1^3 + G_2^3$ = 2abc.
29. Show that area of the triangle formed by the lines $y = m_1x + c_1 = m_2x + c_2$ and x = 0 is $\frac{(c_1-c_2)^2}{2|m_1-m_2|}$.

Practice Test Paper

Class XI **Subject – Maths** **M.M. 100**

General Instruction: As Per CBSE Sample Paper. **Section (A)**

1. Determine the domain and range of the relation R, defined by R = {(x, x+5) : x ∈ {0, 1, 2, 3, 4, 5}}.
2. How many signals can be formed from 4 flags of different colors using all at a time?
3. A point R with x- coordinate 4 lies on the line segment joining the points (2, -3, 4) and (8, 0, 10). Find the coordinates of point R.
4. Find the values of 'k', such that the distance of the point (4, 1) from the line 3x – 4y + k = 0 is 4 units.
5. Find the equation of the ellipse whose vertices are $(\pm 6, 0)$ *and foci are* $(\pm 4, 0)$.
6. Evaluate : $\lim_{x \to 0} \frac{sinax + bx}{ax + sinbx}$, a, b, a + b $\neq 0$.
7. Evaluate : $\lim_{x \to 1} \frac{1-\frac{1}{x}}{\sin\{\pi(x-1)\}}$.
8. Express the following statements by appropriate symbols:

   (i) She is rich and beautiful (ii) She is rich but not beautiful

   (iii) Either she is rich or she is beautiful (iv) She is neither rich nor beautiful.
9. Check whether the following statements is true or not :

   "If a and b are integers than ab is a rational number".
10. Determine the truth value of the statement, "$\pi > 2$ *and* $\pi < 3$".

Section – B

11. Prove that : $\frac{cos4x+\cos 3x+\cos 2x}{sin4x+sin3x+sin2x} = cot3x.$
12. If A and B are two sets and U is a universal set such that n(U) = 1000, n(A) = 300, n(B) = 400 and n(A ∩ B) = 200, find the total number of elements which neither belongs to A nor to B.
13. If A = {2, 3, 5, 7, 8} B = {1, 5, 9} and U = { $x \in N : x \leq 9$}, verify that B – A = A' ∩ B.

    Or

    Let A = {1, 2, 3, 4, 6}, and R be the relation on A defined by {(a, b) : a, b ∈ A, a divides b}

    (i) Write R in roaster form

    (ii) Find the domain of R

    (iii)Find the range of R.
14. Prove that tan 70^0 = tan 20^0 + 2 tan50^0.

15. Use the principle of mathematical induction to prove $(1 + x)^n \geq 1 + nx$, $\forall\, n \in N$ and x > 0. **Or**

    2^{3n} - 7n − 1 is divisible by 49 $\forall\, n \in N$.

16. The difference between any two consecutive interior angles of a polygon is 5^0. If the smallest angle is 120^0. Find the number of the sides of the polygon.

Or

Mr. Roy saved ` 16,500 in ten years. In each year after the first he saved ` 100 more than he did in the preceding year. How much did he save in first year?

17. How many words with or without meaning, each of 2 vowels and 3 consonants can be formed from the letters of word 'DAUGHTER'?

18. Find the equation of the parabola with foci (0, ± 3) and vertices (0, $\pm\frac{\sqrt{11}}{2}$).

Or

Prove that, the product of the lengths of the perpendicular drawn from the point $(\pm\sqrt{a^2 - b^2}, 0)$ to the line $\frac{x}{a}\cos\theta + \frac{y}{b}\sin\theta = 1$ is b^2.

19. Find the derivative of cos $(x - \frac{\pi}{8})$ with respect to x, from first principle.

20. Four cards are drawn from q well shuffled pack of 52 cards. What is the probability of obtaining three diamonds and one spade?

21. If 2/11 is the probability of an event. What are the odds against the event?

22. Calculate the S.D. for the following data:

C.I.	*0 – 10*	*10 – 20*	*20 – 30*	*30 – 40*	*40 – 50*	*50 – 60*	*60 – 70*	*70 – 80*
f	*5*	*8*	*7*	*12*	*28*	*20*	*10*	*10*

Section – C

23. Draw the graph of the function f(x) defined by f(x) = $\begin{cases} 1 - x, & x < 0 \\ 1, & x = 0. \\ 1 + x, & x > 0 \end{cases}$

24. Solve for x: $\sqrt{3}\,\cos x + \sin x = \sqrt{2}$.

25. If x + iy = $\sqrt{\frac{a+ib}{p+iq}}$, prove that $(x^2 + y^2)^2 = \frac{a^2+b^2}{p^2+q^2}$.

Or

If a + ib = $\frac{c+i}{c-i}$ a, b, c $\in R$, show that $a^2 + b^2 = 1$ and $\frac{b}{a} = \frac{2c}{c^2-1}$.

26. Find the graphical solution of the system of inequation, $x + 2y \leq 10$, $x + y \geq 1$, $x - y \leq 0$, $x, y \geq 0$.
27. If a, b, c are in GP and x, y are arithmetic mean between a, b and b, c respectively, prove that

    (i) $\frac{a}{x} + \frac{c}{y} = 2$ (ii) $\frac{1}{x} + \frac{1}{y} = \frac{2}{b}$.
28. If the coefficients of x^{r-1}, x^r, x^{r+1} in the binomial expansion of $(1 + x)^n$ are in A.P.,

    prove that $n^2 - (4r + 1)n + 4r^2 - 2 = 0$ **Or**

    if the three consecutive coefficients in the expansion of $(1 + x)^n$ are in the ration 6 : 33 : 110, find n.
29. Find the equation of the straight line which passes through (3, 4) and the sum of whose intercepts on the co-ordinate axes is 14

FORMATIVE ASSESMENT NUMBER – 4 , CLASS – 10 Section____ MaX. Marks – 20

Name of student:____

Each question carries 1 mark.

1. Which of the following has 2 as a root: (a) $4x^2 – 12x + 9$ (b) $6x^2 + x – 12$ (c) $9x^2 – 22x + 8$ (d) $x^2 – 18x +77$
2. If $\frac{6}{5}, a, 4$ are in AP the value of 'a' is : (a) 1 (b) $\frac{26}{5}$ (c) $\frac{13}{5}$ (d) 13
3. If two tangents inclined at an angle of 60^0 are drawn to a circle of radius 3 cm, then length of each tangent in cms is: (a) $\frac{3\sqrt{3}}{2}$ (b) $2\sqrt{3}$ (c) $3\sqrt{3}$ (d) 6
4. To divide a line segment in 3 : 5, first a ray AX is drawn so that angle BAX is an acute angle and then at equal distance points are marked on the ray AX such that the minimum number of these points is:
   (a) 5 (b)3 (c)2 (d)8
5. The area of two circles is in the ratio 16:25. The ratio of their circumference is: (a) 16:25(b)25:16 (c) 4:5(d)5:4
6. A horse is tied for grazing in square field at one corner with a rope of 7m long. The area in sq.m, it can graze is: (a) 77 (b) 154 (c) 77/2 (d) don't know
7. Total surface area of a cube is 216 sqm. Its volume in cc is: (a) 216 (b) 144 (c) 196 (d) 212
8. The angle formed by line of vision with the horizon in upward is: (a) right (b) straight (c) angle of depression (d) angle of elevation
9. An event cannot occur then its probability is (a) 0 (b) 1 (c) <1 (d) >1
10. The general term of an AP is given by 2n – 3 for all natural number 'n' the common difference of this AP is:
    (a)2 (b) 3 (c) – 2 (d) – 3
11. The roots of QE. $3x^2 – 5x + 4$ are : (a) real and unequal (b) real and equal (c) imaginary
12. In an AP $a_{25} – a_{12}$ = -- 52 then C.D. is (a) 4 (b) – 4 (c) – 3 (d) 3
13. Angle between two tangents from an external point to a same circle is 35^0 , the radii of circle at point of contact are inclined at centre at an angle of : (a) 110^0 (b) 145^0 (c) 120^0 (d) 90^0
14. The difference between circumference and radius of a circle is 37 cm. the area of circle is (sq. cm) :
    (a) 110 (b) 144 (c) 154 (d) 212
15. The diameter of a wheel is 50cm, number of revolutions it will make in covering 2.2km:
    (a) 700 (b) 1400 (c) 2100 (d) 2800

16. A cone is cut by a plane parallel to its base and then upper cone is removed, the portion left is a:
    (a) cone (b) frustum of cone (c) circle (d) cylinder
17. The probability of getting a bad egg from a lot of 400 eggs is 0.035. the number of bad eggs in the lot is:
    (a) 28 (b) 21 (c) 14 (d) 7
18. If $ax^2 + bx + c = 0$ has equal roots then c is equal to: (a) $\frac{-b}{4a}$ (b) $\frac{-b^2}{4a}$ (c) $\frac{b}{4a}$ (d) $\frac{b^2}{4a}$
19. Two cubes have their volume in the ratio 1 : 8. The ratio of their TSA is: (a) 1:2 (b) 1:4 (c) 1:9 (d) 1:16
20. Which of the following cannot be the probability of an event: (a) 1/3 (b) 0.1 (c) 3% (d) 17/16

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