CLASS-XII (2014-2015)

QUESTION WISE BREAK UP

Type of Question	Mark per Question	Total No. of Questions	Total Marks
VSA	**1**	**6**	**06**
LA-I	**4**	**13**	**52**
LA-II	**6**	**7**	**42**
Total 26			**100**

1. *No chapter wise weightage. Care to be taken to cover all the chapters.*
2. ***The above template is only a sample. Suitable internal variations may be made for generating similar templates Keeping the overall weightage to different form of questions and typology of questions same***

CHAPTERWISE MARKS in Class-XII (CBSE)

Sr. No	TOPICS	MARKS				
		V SA(1M)	S A (4M)	L A (6M)	Total Marks	
1 a	Relation & Function	1		Nil	1	10
1 b	Binary operation		1		4	
1 c	Inverse Trig. Func	1	1	Nil	5	
2.a	Matrices	1+1+1		1	9	13
b	Determinant		1	Nil	4	
3.a.	Continuity, Differentiability	Nil	1 + 1+ 1	Nil	12	44
b.	Applications Of Derivative	Nil	1	1	10	
c.	Integrals	Nil	1 + 1	Nil	8	
d	Applications Of Integrals	Nil	Nil	1	6	
e	Differential Equations	Nil	1+1		8	
4.a	Vectors	1	1	1	11	17
b	Three Dimensional Geometry		OR	1	6	
5.	Linear Programming	Nil	Nil	1	6	
6.	Probability	Nil	1 OR	1	10	
	TOTAL	6	13	7	100	

[Model Test–08/XII (14-15)_ 13th Nov’14] MODEL TEST (Pre-Board’2015_CBSE) [FM–100 /Time–180 min.]

General Instructions :

i) All questions are compulsory.

ii) The question paper consists of **26** questions divided into three sections **A, B** and **C**. Section **A** comprises of **6** questions of **one** mark each, Section **B** comprises of **13** questions of **four** marks each and section **C** comprises of **07** questions of **six** marks each.

iii) All questions in Section **A** are to be answered in **one** word, **one** sentence or as per the exact requirement of the question.

iv) There is no overall choice. However, internal choice has been provided in **04** questions of **four** marks each and **02** questions of **six** marks each. You have to attempt only one of the alternatives in all such questions.

v) Use of calculators is **no**t permitted. You may use logarithmic tables, if required.

Section-A (01 mark each)

1. If f: R →R is defined by $f(x) = 3x^2 - 3x + 2$, find f(f(x)).

2. Find the value of $(\tan^{-1}1 + \tan^{-1}2 + \tan^{-1}3)$.

3. Find the value of x if $2\begin{bmatrix}1 & 3\\ 0 & x\end{bmatrix} + \begin{bmatrix}3 & 0\\ 1 & 2\end{bmatrix} = \begin{bmatrix}5 & 6\\ 1 & 8\end{bmatrix}$.

4. If $A = \begin{bmatrix}3 & \sqrt{3} & 2\\ 4 & 2 & 0\end{bmatrix}$, then find A'.

5. If $\begin{vmatrix}5 & 2\\ 4 & 3\end{vmatrix} \times \begin{vmatrix}1 & 7\\ 8 & 6\end{vmatrix} = \begin{vmatrix}a & b\\ c & d\end{vmatrix}$, then find a, b, c,d.

6. Find the value of ‘m’ for which $m\left(\hat{i} + \hat{j} + \hat{k}\right)$ is a unit vector.

Section-B (04 marks each)

7. Let A = N × N and * be a binary operation on A defined by (a, b) * (c, d) = (a+c, b+d). Show that * is commutative as well as associative. Also find its identity element for * on A, if any.

8. Prove that, $\tan\left(\frac{\pi}{4} + \frac{1}{2}\cos^{-1}\frac{a}{b}\right) + \tan\left(\frac{\pi}{4} - \frac{1}{2}\cos^{-1}\frac{a}{b}\right) = \frac{2b}{a}$.

OR, Show that $\sin^{-1}\frac{12}{13} + \cos^{-1}\frac{4}{5} + \tan^{-1}\frac{63}{16} = \pi$.

9. Show that $\begin{vmatrix}3a & -a+b & -a+c\\ -b+a & 3b & -b+c\\ -c+a & -c+b & 3c\end{vmatrix} = 3(a+b+c)(ab+bc+ca)$

10. Show that the function $f(x) = |x-3|$, is continuous but not differentiable at x = 3.

11. If y = sin(log x), prove that, $x^2.\frac{d^2y}{dx^2} + x.\frac{dy}{dx} + y = 0$

12. Find the derivative of $\sin^{-1}\frac{2x}{1+x^2}$ with respect to $\cos^{-1}\frac{1-x^2}{1+x^2}$.

13. Find the equation of the tangent and the normal to the curve $x^{\frac{2}{3}} + y^{\frac{2}{3}} = 2$ at point (1, 1).

14. Evaluate : $\int \sin^{-1}\sqrt{\frac{x}{a+x}}dx$ OR, Evaluate : $\int \frac{\sin x + \cos x}{\sqrt{\sin 2x}} dx$

15. Evaluate the integral $\int_1^2 (3x^2 - x)dx$ as limit of sum.

16. Form the differential equation of the family of circles in the 3rd quadrant and touching the coordinate axes.

17. Find the particular solution of the following differential equation : $\frac{dx}{dy} + y\cot x = x(x.\cot x + 2)$ $(x \neq 0)$.

Given that $y = 0$ *when* $x = \frac{\pi}{2}$.

18. Find the equation of the plane, which is parallel to x-axis and passes through the line of intersection of the planes $\vec{r}.(\hat{i} + \hat{j} + \hat{k}) - 1 = 0$ and $\vec{r}.(2\hat{i} + 3\hat{j} - \hat{k}) + 4 = 0$.

19. A random variable X has the following probability distribution :

X	0	1	2	3	4	5	6	7
P(X)	0	k	2k	2k	3k	k^2	$2k^2$	$2k^2+k$

Determine (i) k (ii) P(X<3) (iii) P(X>6) (iv) P(0 < X <3) .

OR, Assume that each born child is equally likely to be a boy or a girl. If a family has 2 children, what is the conditional probability that both are girls given that (i) the youngest is a girl, (ii) at least one is a girl.

Section-C (06 marks each)

20. Find the values of x, y, z, if the matrix $A = \begin{bmatrix} 0 & 2y & z \\ x & y & -z \\ x & -y & z \end{bmatrix}$ satisfy the equation $A'A = I$.

21. A water tank has the shape of an inverted right circular cone with its axis vertical and vertex lowermost. Its semi vertical angle is $\tan^{-1}(0.5)$. Water is poured into it at a constant rate 5 cubic meters per hour. Find the rate at which the level of the water is rising at the instant when the depth of water in the tank is 4 m.

OR, Prove that the radius of the right circular cylinder of greatest curved surface area which can be inscribed in a given cone is half of that of the cone.

22. Using integration, find the area of the ΔABC, formed by joining points A(2,0), B(4, 6) and C(5, 3).

23. Show that the area of the parallelogram having diagonals $(3\hat{i} - \hat{j} - 2\hat{k})$ and $(\hat{i} - 3\hat{j} + 4\hat{k})$ is $5\sqrt{3}$ sq units.

24. Find the equation of the plane through the intersection of the planes 3x – y + 2z = 4 and x + y + z = 2 and passing through the point (2, 2, 1). Also find the distance of the plane from the origin.

OR, Find the shortest distance between the lines whose vector equations are $\vec{r} = (1-t)\hat{i} + (t-2)\hat{j} + (3-2t)\hat{k}$ and $\vec{r} = (1+t)\hat{i} + (2t-1)\hat{j} + (-1-2t)\hat{k}$.

25. A retired person has ` 70,000 to invest in two types of bonds. First type of bond yields an annual income of 8% on the amount invested and the second type bond yields 10% per annum. As per norms he has to invest minimum of ` 10,000 in first type and not more than ` 30,000 in second type. How should he plan his investment so as to get maximum return after one year of investment ? Do you think that a person should start saving at an early age for his retirement ? Can you name some avenues. ?

26. A man is known to speak truth 3 out of 4 times. He throughs a die and reports that it is a six. Find the probability that it is actually six.

"Learning is a Treasure,
which accompanies
its owner everywhere."

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