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) **’2015 Onwards**

Sr. No	TOPICS		MARKS				
		Question Set	V SA(1M)	S A (4M)	L A (6M)	Total Marks	
1 a)	Relation & Function		1	1	Nil	5	10
1 b)	Binary operation						
1 c)	Inverse Trig. Func		1	1 OR	Nil	5	
2.a)	Matrices		**1+1+1**		1	9	13
b)	Determinant			**1**	Nil	4	
3.a.	Continuity, Differentiability		Nil	**1** + **1**	Nil	8	44
b.	Applications Of Derivative		Nil	1 +1 OR	1	14	
c.	Integrals		Nil	**1** + **1**	Nil	8	
d	Applications Of Integrals		Nil	Nil	1 OR	6	
e	Differential Equations		Nil	1+1		8	
4.a	Vectors		1		1OR	7	17
b	Three Dimensional Geometry			1 OR	1	10	
5.	Linear Programming		Nil	Nil	1		6
6.	Probability		Nil	1 OR	1		10
	TOTAL		6	13	7		100

[Model Test–06(Q)/XII _30th Oct'14] MODEL TEST (Pre-Board_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. Given, S = {1, 2, 3}. Determine whether the function f: S →S, defined as f = {(1, 2), (2, 1), (3, 1)} have inverse.

2. Write the value of $\cos^{-1}\left(\cos\frac{13\pi}{6}\right)$.

3. For what value of x, is the matrix $\begin{bmatrix} 0 & 1 & -2 \\ -1 & 0 & 3 \\ x & -3 & 0 \end{bmatrix}$ a skew-symmetric matrix?

4. Write two non-zero matrices whose product is a zero matrix.

5. Evaluate $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}\begin{bmatrix} 2 & 3 & 4 \end{bmatrix}$.

6. If $\vec{a}$ is any non-zero vector represent $\left(\vec{a}.\hat{i}\right)\hat{i}-\left(\vec{a}.\hat{j}\right)\hat{j}+\left(\vec{a}.\hat{k}\right)\hat{k}$ in terms of $\vec{a}$

Section-B (04 marks each)

7. Let f, g : R →R be defined as f(x) = |x| and g(x) = [x], where [x] denotes greatest integer less than or equal to x. Then evaluate $\dfrac{(gof)\left(-\frac{5}{3}\right)-(fog)\left(-\frac{5}{3}\right)}{(fo(gof))\left(-\frac{5}{3}\right)}$.

8. Prove that $\cos^{-1}\left(\dfrac{\cos\alpha+\cos\beta}{1+\cos\alpha.\cos\beta}\right)=2\tan^{-1}\left(\tan\dfrac{\alpha}{2}.\tan\dfrac{\beta}{2}\right)$.

OR, Solve for x : $\tan^{-1}2x+\tan^{-1}3x=\dfrac{\pi}{4}$.

9. Prove that, $\begin{vmatrix} ab & c & c^2 \\ bc & a & a^2 \\ ca & b & b^2 \end{vmatrix}=(a-b)(b-c)(c-a)(ab+bc+ca)$.

10. If the function f is defined by $f(x)=\begin{cases} 5 & if \quad x\le 2 \\ ax+b & if\ 2<x<10 \\ 21 & if \quad x\ge 10 \end{cases}$, is continuous, then find the values of the constants a and b.

11. If $y^2 = 4ax$, prove that, $\frac{d^2y}{dx^2}.\frac{d^2x}{dy^2}=-\frac{2a}{y^3}$

12. Prove that the straight line px + qy + m = 0 will touch the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ if, $a^2p^2 + b^2q^2 = m^2$.

OR, Find the equation of the tangent to the curve $x^2+3y= 3$, which is parallel to the line y– 4x+5= 0.

13. Using differential, find the approximate value of $(3.968)^{\frac{3}{2}}$.

14. Evaluate: $\int \frac{1}{\sin(x-a).\cos(x-b)}\,dx$.

15. Using properties of definite integral, prove that $\int_0^{\pi}\frac{x.\tan x}{\sec x \cos ec\, x}\,dx=\frac{\pi^2}{4}$

16. Solve the differential equation $(xdy-ydx)+\sin\left(\frac{y}{x}\right)=(ydx+xdy)\,x\cos\left(\frac{y}{x}\right)$.

17. Solve the differential equation $\frac{dx}{dy}\left(\frac{e^{-2\sqrt{x}}-y}{\sqrt{x}}\right)=1, \qquad x\neq 0$

18. Find the coordinates of the foot of the perpendicular drawn from the point A (1, 8, 4) to the line joining the points B (0, −1, 3) and C (2, −3, −1).

OR, Find the equation of the plane which is perpendicular to the plane 5x + 3y + 6z + 8 = 0 and which contains the line of intersection of the planes x + 2y + 3z – 4 = 0 and 2x + y – z + 5 = 0.

19. Probabilities of solving a specific problem independently by A and B are $\frac{1}{2}$ and $\frac{1}{3}$ respectively. If both try to solve the problem independently, find the probability that (i) the problem is solved (ii) exactly one of them solves the problem.

OR, Two cards are drawn without replacement from a well shuffled pack of 52 cards. Find the probability that one is a spade and other is a queen of red colour.

Section-C (06 marks each)

20. Using elementary operations, find the inverse of $A=\begin{bmatrix} 1 & 3 & -2 \\ -3 & 0 & -5 \\ 2 & 5 & 0 \end{bmatrix}$, if it exists.

21. Using integration, find the area of the circle $x^2+ y^2 =16$, which is exterior to the parabola $y^2 =6x$.

OR, Find the area of the region bounded by the curve $x^2 + y^2 = 1$, the line y = x and the positive x-axis.

22. Find the point on the curve $x^2 = 8y$ which is nearest to the point (2, 4).

23. Find the projection of $\vec{b}+\vec{c}$ on $\vec{a}$, where $\vec{a}=2\hat{i}-2\hat{j}+\hat{k}$, $\vec{b}=\hat{i}+2\hat{j}-2\hat{k}$ and $\vec{c}=2\hat{i}-\hat{j}+4\hat{k}$.

OR, Find the value of λ which makes the vectors $\vec{a}$, $\vec{b}$, $\vec{c}$, co-planar, where $\vec{a}=2\hat{i}-\hat{j}+\hat{k}$, $\vec{b}=\hat{i}+2\hat{j}-3\hat{k}$ and $\vec{c}=3\hat{i}-\lambda\hat{j}+5\hat{k}$.

24. Find the coordinates of the point where the line through the points A(3, 4, 1) and B(5, 1, 6) crosses the XY plane.

25. A manufacturer has three machine operators A, B and C. The first operator A produces 1% defective items, where as the other two operators B and C produce 5% and 7% defective items respectively. A is on the job for 50% of the time, B is on the job for 30% of the time and C is on the job for 20% of the time. A defective item is produced, what is the probability that was produced by A ?

26. A house wife wishes to mix together two kinds of food, X and Y, in such a way that the mixture contains at least 10 units of vitamin A, 12 units of vitamin B and 8 units of vitamin C. The vitamin contents of one kg of food is given below :

	Vitamin A	Vitamin B	Vitamin C
Food X	1	2	3
Food Y	2	2	1

One kg of food X costs Rs 6 and one kg of food Y costs Rs10. Make it as an LPP and solve graphically. Find the least cost of the mixture which will produce the diet.

"WHEN WE THINK WE KNOW,

WE CEASE TO LEARN"

_Dr. S RADHAKRISHNAN

Paper Submitted by :
SAMIR BASU
Burdwan, WB
Mob-9434100810
Email_barunabasu@gmail.com