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 ALLOCATION Of MARKS in Class-XII (CBSE)’2015

Sr. No	TOPICS	MARKS				
		V S A (1 mark each)	S A (4 marks each)	L A (6 marks each)	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	Nil	1	9	13
b)	Determinant		1	Nil	4	
3.a.	Continuity, Differentiability	Nil	1+1	Nil	8	46
b.	Applications Of Derivative	Nil	1 +1	1 OR	14	
c.	Integrals	Nil	1+1 OR	Nil	8	
d	Applications Of Integrals	Nil	Nil	1	6	
e	Differential Equations	Nil	1	1	10	
4.a	Vectors	1	1		5	15
b	Three Dimensional Geometry		1 OR	1 OR	10	
5.	Linear Programming	Nil	Nil	1	6	
6.	Probability	Nil	1 OR	1	10	
	TOTAL	6	13	7	100	

NOTE :

[Model Test–05(Q)/XII _23rd Oct'14] MODEL TEST (Pre HS'15_CBSE) [FM–100 /Time–180 min.]

General Instructions :

i) All questions are compulsory.
ii) The question paper consists of **29** questions divided into three sections **A, B** and **C**. Section **A** comprises of **10** questions of **one** mark each, Section **B** comprises of **12** 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. Let * be a binary operation on N, set of natural numbers, given by $a*b=HCF(a,\ b),\quad a,b\in N$. Write the value of 22 * 4.
2. If A is a 2×3 matrix, can we find A^2 ? Give reason.
3. Write the principal value of $\tan^{-1}1-\cos^{-1}\left(-\frac{1}{2}\right)$.
4. Find the value of 'a' if $\begin{bmatrix} a-b & 2a+c \\ 2a-b & 3c+d \end{bmatrix}=\begin{bmatrix} -1 & 5 \\ 0 & 13 \end{bmatrix}$
5. If A_{ij} is the cofactor of the element a_{ij} of the determinant $\begin{vmatrix} 2 & -3 & 5 \\ 6 & 0 & 4 \\ 1 & 5 & -7 \end{vmatrix}$, then write the value of $a_{32}.A_{32}$.
6. Find the value of 'p' if $\left(2\hat{i}+6\hat{j}+27\hat{k}\right)\times\left(\hat{i}+3\hat{j}+p\hat{k}\right)=\vec{0}$.

Section-B (04 marks each)

7. Show that the function f in $A=R-\left\{\frac{2}{3}\right\}$ defined as $f(x)=\frac{4x+3}{6x-4}$ is one-one and onto. Hence find f^{-1}.
8. Solve for 'x': $2\tan^{-1}(\cos x)=\tan^{-1}(2.\operatorname{cosec} x)$

OR, Prove that, $\tan^{-1}\left(\frac{\cos x}{1+\sin x}\right)=\frac{\pi}{4}-\frac{x}{2},\quad x\in\left(-\frac{\pi}{2},\frac{\pi}{2}\right)$

9. Using the properties of the determinants, prove the following : $\begin{vmatrix} 1 & 1+p & 1+p+q \\ 2 & 3+2p & 1+3p+2q \\ 3 & 6+3p & 1+6p+3q \end{vmatrix}=1$.
10. If $y=\frac{\sin^{-1}x}{\sqrt{1-x^2}}$, then prove that, $\left(1-x^2\right)\frac{d^2y}{dx^2}-3x\frac{dy}{dx}-y=0$.
11. Solve : $x.\log_e x.\frac{dy}{dx}+y=\frac{2}{x}\log_e x$ [cbse'09]
12. Find the value of 'k', for which $f(x)=\begin{cases} 2x+1 ; & x<2 \\ k ; & x=2 \\ 3x-1 ; & x>2 \end{cases}$ is continuous at x = 2.

13. Find the intervals in which the function f given by $f(x)=\dfrac{4\sin x-2x-x.\cos x}{2+\cos x}$ is (i) increasing (ii) decreasing.

14. Evaluate : $\int\sqrt{\dfrac{\sin(x-\alpha)}{\sin(x+\alpha)}}\,dx$.

15. Using properties of definite integrals, evaluate : $\int_0^{\frac{\pi}{4}}\log(1+\tan x)\,dx$.

OR, Using properties of definite integrals, evaluate : $\int_0^{\pi}\dfrac{x.dx}{a^2\cos^2 x+b^2\sin^2 x}$

16. Find the equation of the tangent to the curve $x=\sin 3t,\ y=\cos 2t$ at $t=\frac{\pi}{4}$.

17. If $\vec{a}=\left(\hat{i}+\hat{j}+\hat{k}\right)$ and $\vec{b}=\left(\hat{j}-\hat{k}\right)$, find a vector $\vec{c}$ such that $\vec{a}\times\vec{c}=\vec{b}$ and $\vec{a}.\vec{c}=3$.

18. Find the distance between the point P (6, 5, 9) and the plane determined by the points A(3, – 1, 2), B(54, 2, 4) and C(– 1, – 1, 6).

OR, Find the equation of the perpendicular drawn from the point P(2, 4, – 1) to the line $\dfrac{x-2}{3}=\dfrac{y+1}{4}=\dfrac{z-2}{2}$. Also write down the coordinates of the foot of the perpendicular from P to the line.

19. A family has 2 children. Find the probability that both are boys, if it is known that (i) At least one of the children is a boy (ii) The elder child is a boy.

OR, An instructor has a question bank consisting of 300 easy True/False questions, 200 difficult True/False questions, 500 easy multiple choice questions and 400 difficult multiple choice questions. If a question is selected at random from the question bank, what is the probability that it will be an easy question given that it is a multiple choice question ?

Section-C (06 marks each)

20. Using matrix method, solve the following system of equation

$$\frac{2}{x}+\frac{3}{y}+\frac{10}{z}=4$$
$$\frac{4}{x}-\frac{6}{y}+\frac{5}{z}=1 \qquad x,\ y,\ z\neq 0$$
$$\frac{6}{x}+\frac{9}{y}-\frac{20}{z}=2$$

21. Show that the differential equation $2ye^{\frac{x}{y}}dx+\left(y-2xe^{\frac{x}{y}}\right)dy=0$ is homogeneous. Find the particular solution of this differential equation, given that x = 0 when y=1

22. Using integration, find the area of the region bounded by the parabola $y^2=4x$ & the circle $4x^2+4y^2=9$.

23. Show that the right circular cylinder of given surface and maximum volume is such that its height is equal to the diameter of the base.

OR, Show that the right circular cone of least curved surface area and given volume has an altitude equal to $\sqrt{2}$ time the radius of the base.

24. Find the equation of the plane passing through the point (– 1, – 1, 2) and perpendicular to each of the following planes : 2x + 3y – 3z = 2 and 5x – 4y +z = 6.

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

25. A doctor is to visit a patient. From the past experience, it is known that the probabilities that he will come by train, bus, scooter or by other means of transport are respectively $\frac{3}{10}, \frac{1}{5}, \frac{1}{10}$ and $\frac{2}{5}$. The probability that he will be late are $\frac{1}{4}, \frac{1}{3}$ and $\frac{1}{12}$, if he comes by train, bus and scooter respectively, but if he comes by other means of transport, then he will not be late. When he arrives, he is late. What is the probability that he comes by train ?

26. A cottage industry manufactures pedestal lamps and wooden shades, each requiring the use of grinding/cutting machine and a spryer. It takes two hours on the grinding/cutting machine and 3 hours on the sprayer to manufacture a pedestal lamp. It takes one hour on the grinding/cutting machine and 2 hours on the sprayer to manufacture a shade. On any day the sprayer is available for at the most 20 hours and the grinding/cutting machine for at the most 12 hours. The profit from the sale of a lamp is Rs 5 and that from a shade is Rs 3. Assuming that the manufacturer can sell all the lamps and shades that he produces, how should he schedule his daily production in order to maximize his profit ? Make an L.P.P. and solve it graphically.

“Success is never an Accident.
It is the result of Right Decision at the Right Time.”

Paper Submitted by :
SAMIR BASU
Burdwan, WB, Pin-713101
Mob-9434100810
Email_barunabasu@gmail.com