CODE:0027- TMC-TS-1

पंजियन क्रमांक REG.NO:-TMC -D/79/89/36

General Instructions :-

1. All question are compulsory.
2. The question paper consists of 26 questions divided into three sections A,B and C. Section – A comprises of 6 question of 1 mark each. Section – B comprises of 13 questions of 4 marks each and Section – C comprises of 7 questions of 6 marks each .
3. There is no overall choice. However, internal choice has been provided in 4 question of four marks and 2 questions of six marks each. You have to attempt only one lf the alternatives in all such questions.
4. Use of calculator is not permitted.
5. Please check that this question paper contains 8 printed pages.
6. Code number given on the right hand side of the question paper should be written on the title page of the answer-book by the candidate.

Time : 3 Hours — अधिकतम समय : 3
Maximum Marks : 100 — अधिकतम अंक : 100
Total No. Of Pages :4 — कुल पृष्ठों की संख्या : 4

PRE-BOARD EXAMINATION 2015 -16

CLASS – XII CBSE MATHEMATICS

SECTION A

Q.1 If $\vec{a}$ and $\vec{b}$ are two unit vectors inclined to x-axis at angles 30° and 120° respectively, then wite the value of $|\vec{a}+\vec{b}|$

Q.2 For what value of k, the matrix $\begin{pmatrix} 2k+3 & 4 & 5 \\ -4 & 0 & -6 \\ -5 & 6 & -2k-3 \end{pmatrix}$ is skew symmetric ?

Q.3 Find the sum of the degree and the order of differential equation : $\frac{d}{dx}\left[\left(\frac{d^2y}{dx^2}\right)^4\right]=0$.

Q.4 Find the sine of the angle between the line $\frac{x-2}{3}=\frac{y-3}{4}=\frac{z-4}{5}$ and the plane $2x-2y+z-5=0$

Q.5 If $|\vec{a}|=a$, then find the value of $|\vec{a}\times\hat{i}|^2+|\vec{a}\times\hat{j}|^2+|\vec{a}\times\hat{k}|^2$

Q.6 Write the integrating factor of the following differential equation : $(1+y^2)+(2xy-\cot y)\frac{dy}{dx}=0$.

SECTION B

Q.7 In a parliament election, a political party hired a public relations firm to promote its candidates in three ways - telephone, house calls and letters. The cost per contact (in paise) is given in matrix A as

$$A=\begin{bmatrix} 140 \\ 200 \\ 150 \end{bmatrix} \begin{matrix} \text{Telephone} \\ \text{House cell} \\ \text{Letters} \end{matrix}$$

Resi.: D-79 Vasant Vihar ; Office : 89-Laxmi bai colony
Ph. :2337615; 4010685®, 2630601(O) Mobile : 9425109601 (P); 9907757815; 9425110860; 425772164; Email:agyat99@gmail.com.

	The number of contact of each type made in two cities X and Y is given in the matrix B as Telephone House call Letters $B = \begin{bmatrix} 1000 & 500 & 5000 \\ 3000 & 1000 & 10000 \end{bmatrix}$ City X City Y Find the total amount spent by the party in the two cities. What should one consider before casting his/her vote - party's promotional activity or their social activities ?
Q.8	Evaluate $\int \left(\frac{1}{\sqrt{\sin^3 x \sin(x+a)}} \right) dx$. OR Evaluate : $\int (2\sin 2x - \cos x)\left(\sqrt{6 - \cos^2 x - 4\sin x} \right) dx$
Q.9	Verify mean value theorem for the function $f(x) = (x-4)(x-6)(x-8)$ on the interval [4, 10]. OR Find the point on the curve $9y^2 = x^3$, where the normal to the curve makes equal intercepts on the axes.
Q.10	Using the properties of determinants, prove the following : $\begin{vmatrix} 1 & x & x+1 \\ 2x & x(x-1) & x(x+1) \\ 3x(1-x) & x(x-1)(x-2) & x(x+1)(x-1) \end{vmatrix} = 6x^2(1-x^2)$
Q.11	Find the value of x for which the angle between the vectors $\vec{a} = 2x^2 i + 4xj + k$ & $\vec{b} = 7i - 2j + xk$ is obtuse.
Q.12	Evaluate $\int_{-1}^{\frac{3}{2}} \lvert x \sin \pi x \rvert dx$
Q.13	Find the particular solution of the differential equation $(y - \sin x)dx + (\tan x)dy = 0$ satisfying the condition that y = 0 when x = 0.
Q.14	If $y = x^3 \log\left(\frac{1}{x}\right)$, then prove that $x \frac{d^2 y}{dx^2} - 2\frac{dy}{dx} + 3x^2 = 0$.
Q.15	In a set of 10 coins, 2 coins are with heads on both the sides. A coin is selected at random from this set and tossed five times. If all the five times, the result was heads, find the probability that the selected coin had heads on both the sides.
Q.16	Find the differential equation for all the straight lines, which are at a unit distance from the origin.
Q.17	Find the value of k for which the following lines are perpendicular to each other $\frac{x+3}{k-5} = \frac{y-1}{1} = \frac{5-z}{-2k-1}; \frac{x+2}{-1} = \frac{2-y}{-k} = \frac{z}{5}$.Hence find the equation of the plane containing the above lines. OR Find the equation of the line passing through the point (-4, 3, 1), parallel to the plane $x + 2y - z = 0$ and intersecting the line $\frac{x+1}{3} = \frac{y-3}{-2} = \frac{z-2}{1}$.

Resi.: D-79 Vasant Vihar ; Office : 89-Laxmi bai colony
Ph. :2337615; 4010685®, 2630601(O) Mobile : 9425109601 (P); 9907757815; 9425110860; 425772164; Email:agyat99@gmail.com.

Q.18	Evaluate $\int_0^4 (\|x-1\|+\|x-2\|+\|x-3\|)\,dx$.
Q.19	Prove that: $2\tan^{-1}\left\{\tan\frac{\alpha}{2}.\tan\left(\frac{\pi}{4}-\frac{\beta}{2}\right)\right\}=\tan^{-1}\frac{\sin\alpha\cos\beta}{\cos\alpha+\sin\beta}$ OR If $\left(\tan^{-1}x\right)^2+\left(\cot^{-1}x\right)^2=\frac{5\pi^2}{8}$ Find x .
	SECTION C
Q.20	Using integration, find the area of the region $\{(x, y): x^2 + y^2 \le 1 \le x + \frac{y}{2};\ x, y \in R\}$
Q.21	Two trusts A & B receive Rs. 70000 and 55000 respectively from central government to award prize to persons of a district in 3 fields agriculature, eduction and social servies. Trust a awarded 10, 5 and 15 persons in the field of agriculature, eduction and social services respectively while trust B awarded 15, 10 and 5 persons in the field of agriculature, education and social services respectively. If all three prizes together amount to Rs. 6000, them find amount of each prize by matrix method. What field you prefer most for award for development of society ? Give answer with justifications
Q.22	A company manufactures three kinds of calculates : A, B and C is its two factories I and II. The company has got an order for manufacturing at least 6400 calculators of kind A, 4000 of kind B and 4800 of kind C. the daily output of factory I is of 50 calculators of kind A, 50 calculators of kind B, and 30 calculators of kind C. The daily output of factory II is of 40 calculators of kind A, 20 of kind B and 40 of kind C. The cost per day to run factory I is Rs. 12000 and of factory II is Rs. 15000. How many days do the two factories have to be in operation to produce the order with the minimum cost ? Formulate this problem as an LPP and solve it graphically.
Q.23	Two numbers are selected at random (without replacement) from positive integers 2, 3, 4, 5, 6 and 7. Let X denote the larger of the two numbers obtained. Find the mean and variance of the probability distribution of X. **OR** Three cards are drawn successively with replacement from a well shuffled pack of 52 cards. Find the probability distribution of the number of spades. Hence find the mean of the distribution.
Q.24	Prove that the lines line $\frac{x-3}{3}=\frac{2-y}{4}=\frac{z+1}{1}$ and x +2y + 3 z = 0 = 2x + 4 y + 3 z + 3 meet at a point (9,- 6,1) .
Q.25	In a school the school management committee wants to built a hall in the school . During the meeting it was decided that there should be 8 windows of same size in the hall for proper light and fresh air . Each window be in the form of rectangle surmounted by equliletral triangle . The total perimeter of each window is 15 meter . Find the diminsions of the rectangular part of each window so as to admit maximum light and fresh air through the whole opening . Write the two value points behind the decision . OR A given rectangular area is to be fenced off in a field whose length lies along a straight river. If no fencing is needed along the river, show that the least length of fencing will be required when length of the field is twice its breadth.
Q.26	If $f: R-\left\{\frac{7}{5}\right\}\to R-\left\{\frac{3}{5}\right\}$ be defined as $f(x)=\frac{3x+4}{5x-7}$ & $g: R-\left\{\frac{3}{5}\right\}\to R-\left\{\frac{7}{5}\right\}$ be defined as $g(x)=\frac{7x+4}{5x-3}$. Prove that $gof=I_A$ & $(fog)=I_B$ where $B=R-\left\{\frac{3}{5}\right\}$ & $A=R-\left\{\frac{7}{5}\right\}$.Find also g^{-1}, f^{-1} & $(gof)^{-1}$.
	" SUCCESS IS HOW HIGH YOU BOUNCE WHEN YOU HIT BOTTEOM "

Resi.: D-79 Vasant Vihar ; Office : 89-Laxmi bai colony
Ph. :2337615; 4010685®, 2630601(O) Mobile : 9425109601 (P); 9907757815; 9425110860; 425772164; Email:agyat99@gmail.com.

NOTICE-2015-16

All the students of Target Mathematics are hereby informed that your sectional and FULL SYLLABUS tests will be held as per the following schedule.

TIME :- 10:30 TO 01:30 PM **REPORTING TIME :- 10:15 AM**

The Syllabus for the test series is as follows :

DATE	CLASS - X	CLASS - XI	CLASS - XII
27-Dec-15	QUADRATIC EQUATION, ARITHEMATIC PROGRESSION, SURFACE AREA AND VOLUME ; PROBABILITY ,COORDINATE GEOMETRY& AREA RELATED TO CIRCLES	SEQUENCE AND SERIES FULL TRIGNOMETRIC &MATHEMATICAL INDUCTION	FULL COURSE
3-Jan-16	QUADRATIC EQUATION, ARITHEMATIC PROGRESSION, HEIGHTS AND DISTANCES ; AREA RELATED TO CIRCLES ; PROBABILITY & COORDINATE GEOMETRY	PERMUTATION & COMBINATION , COMPLEX NUMBER , QUADRATIC EQUATION & BINOMIAL THEOREM, STATISTICS	FULL COURSE
10-Jan-16	FULL COURSE	**CBSE** :- LINEAR INEQUATION, SETS & RELATION; CO-ORDINATE 3-D,PROBABILITY,STRAIGHT LINES, CONIC SECTIONS **STATE- BOARD** :- LINEAR PROGRAMMING; EXPONENTIAL & LOGARITHMIC SERIES, SIMULTANEOUS EQUATION,STRAIGHT LINES, FAMILY OF LINES, CONIC SECTIONS	FULL COURSE (OUTSIDE PAPER)
17-Jan-16	FULL COURSE (OUTSIDE PAPER)	FULL COURSE	FULL COURSE
24-Jan-16	FULL COURSE	FULL COURSE	FULL COURSE (OUTSIDE)
31-Jan-16	FULL COURSE	FULL COURSE	FULL COURSE
7-Feb-16	FULL COURSE (OUTSIDE PAPER)	FULL COURSE	FULL COURSE
14-Feb-16	FULL COURSE	FULL COURSE	FULL COURSE
21-Feb-16	FULL COURSE	FULL COURSE	FULL COURSE

NOTE :- ALL STUDENTS MUST CARRY THEIR " IDENTITY CARD".

"HARD WORK IS THE ONLY INVESTMENT THAT NEVER FAILS".

DIRECTOR
AGYAT GUPTA

Agyat Gupta (TARGET MATHEMATICS)

Ph.: 4010685, 2630601 (O), Mobile : 9425109601

Resi.: D-79 Vasant Vihar ; Office : 89-Laxmi bai colony

Ph. :2337615; 4010685®, 2630601(O) Mobile : 9425109601 (P); 9907757815; 9425110860; 425772164; Email:agyat99@gmail.com.