TARGET MATHEMATICS
THE EXCELLENCE KEY
AGYAT GUPTA (M.Sc., M.Phil.)

CODE:- AG-9-0099 पजियन क्रमांक REG.NO:-TMC -D/79/89/36

- Please check that this question paper contains 4 printed pages.
- 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.
- Please check that this question paper contains 34 questions.

GENERAL INSTRUCTIONS :

1. All question are compulsory.
2. The question paper consists of 34 questions divided into four sections A,B,C and D. Section – A comprises of 10 question of 1 mark each. Section – B comprises of 8 questions of 2 marks each. Section – C comprises of 10 questions of 3 marks each and Section – D comprises of 6 questions of 4 marks each.
3. Question numbers 1 to 10 in Section – A are multiple choice questions where you are to select one correct option out of the given four.
4. There is no overall choice. However, internal choice has been provided in 1 question of two marks, 3 questions of three marks each and 2 questions of four marks each. You have to attempt only one lf the alternatives in all such questions.
5. Use of calculator is not permitted.
6. An additional 15 minutes time has been allotted to read this question paper only.

सामान्य निर्देश :

1. सभी प्रश्न अनिवार्य हैं।
2. इस प्रश्न पत्र में 34 प्रश्न है, जो चार खण्डों में अ, ब, स व द में विभाजित है। खण्ड – अ में 10 प्रश्न हैं और प्रत्येक प्रश्न 1 अंक का है। खण्ड – ब में 8 प्रश्न हैं और प्रत्येक प्रश्न 2 अंको के हैं। खण्ड – स में 10 प्रश्न हैं और प्रत्येक प्रश्न 3 अंको का है। खण्ड – द में 6 प्रश्न हैं और प्रत्येक प्रश्न 4 अंको का है।
3. प्रश्न संख्या 1 से 10 बहुविकल्पीय प्रश्न हैं। दिए गए चार विकल्पों में से एक सही विकल्प चुनें।
4. इसमें कोई भी सर्वोपरि विकल्प नहीं है, लेकिन आंतरिक विकल्प 1 प्रश्न 2 अंको में, 3 प्रश्न 3 अंको में और 2 प्रश्न 4 अंको में दिए गए हैं। आप दिए गए विकल्पों में से एक विकल्प का चयन करें।
5. कैलकुलेटर का प्रयोग वर्जित है।
6. इस प्रश्न–पत्र को पढ़ने के लिऐ 15 मिनिट का समय दिया गया है। इस अवधि के दौरान छात्र केवल प्रश्न–पत्र को पढेंगे और वे उत्तर–पुस्तिका पर कोई उत्तर नहीं लिखेंगें।

Pre-Board Examination 2011 -12

Time : 3 to $3\frac{1}{4}$ Hours — अधिकतम समय : 3 से $3\frac{1}{4}$

Maximum Marks : 80 — अधिकतम अंक : 80

Total No. Of Pages : 4 — कुल पृष्ठों की संख्या : 4

CLASS – X CBSE (SA-2) MATHEMATICS

SECTION A

Q.1 The value of k for which the equation $x^2+2(k+1)x+k^2=0$ has equal roots is

(a) -1 (b) $-\frac{1}{2}$ (c) 1 (d) none of these Ans. b

Q.2 15^{th} term of the A.P. $x-7, x-2, x+3, \ldots\ldots$ is :

(A) $x+63$ (B) $x+73$ (C) $x+83$ (D) $x+53$ Ans a

Q.3 If one roots of the equation $px^2-14x+8=0$ is six times the other, then p is equal to

(a) 2 (b) 3 (c) 1 (d) none of these Ans. b

Q.4 A quadrilateral ABCD is drawn to circumscribe a circle. If AB = 12cm , BC= 15cm and CD= 14cm, then AD is equal to

(a) 10cm (b) 11cm (c) 12cm (d) 14cm Ans b

Q.5 The volume of a largest sphere that can be cut from cylindrical log of wood of base radius 1 m and height 4 m is :

(A) $\frac{8}{3}\pi m^3$ (B) $\frac{10}{3}\pi m^3$ (C) $\frac{16}{3}\pi m^3$ (D) $\frac{4}{3}\pi m^3$ Ans d

Q.6 If two consecutive vertices of a rhombus are (2,–1), (3, 4) and intersection point of its diagonal are (0 , 1 then the remaining two vertex are

(a) (–3,–2) & (–2, 3) (b) (3,2) &(–2, 3)(c) (–3,–2) & (2,3) (d) (1, 2) & (–3,–2) (Ans. a)

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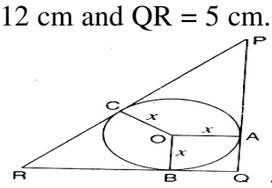
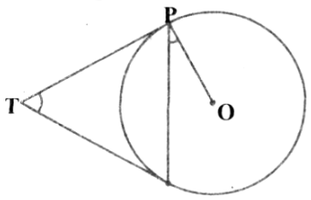
Q.7	The difference between circumference and the radius of a circle is 37m. the circumference of that circle is (a) 7m (b) 44m (c) 154m (d) 77m Ans b
Q.8	A sector of 120^0 cut from a circle has an area of $9\frac{3}{7}cm^2$. The radius of the circle is: Take $\pi = \frac{22}{7}$ (a) 2.5cm (b) 3.0cm (c) 3.5cm (d) 3.6cm **Ans. B**
Q.9	If α, β are the roots of the equation $x^2 + kx + 12 = 0$ such that $\alpha - \beta = 1$, the value of k is : (a) 0 (b) ± 5 (c) ± 1 (d) ± 7 {Ans.d
Q.10	If the height of a tower is half the height of the flagstaff on it and the angle of elevation of the top of the tower as seen from a point on the ground is 30^0. Then the angle of elevation of the top of the flagstaff as seen from the same point is (a) 30^0 (b) 45^0 (c) 90^0 (d) 60^0 . Ans d
	SECTION - B
Q.11	The total surface area of a right circular cone is 90 π cm^2. If the radius of base of the cone is 5 cm, find the height of the cone **Ans** $13cm$
Q.12	One root of the equation $2x^2 - 8x + m = 0$ is 5/2. Find the other root and the value of m . Ans $m = \frac{15}{2}; \alpha = \frac{3}{2}$
Q.13	A pendulum swings through an angle of 30^0 and describes an arc 8.8 cm in length. Find the length of the pendulum. Ans l = 16 . 8 cm
Q.14	A bag contains 5 red balls and some white balls. If the probability of drawing a white ball is double that of red ball, find the number of white balls in the bag. Ans nu. Of white balls = 10
Q.15	The ordinate of a point is twice its abscissa. Find the coordinates of the point if its distance from (4,3) is $\sqrt{10}$. Ans (1,2) (3,6)
Q.16	In given figure PQR is a right angled triangle with PQ = 12 cm and QR = 5 cm. A circle with centre O and radius x is inscribed in ΔPQR. Find the value of x.  . Ans r = 2 OR Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that ∠  PTQ = 2 ∠OPQ.
Q.17	Using quadratic formula, solve the following quadratic equation for x: $x^2 - 4ax + 4a^2 - b^2 = 0$ Ans $\{2a+b, 2a-b\}$
Q.18	Prove that the coordinates of the centroid of a ΔABC with vertices A(x_1, y_1), B(x_2, y_2) and C (x_3, y_3) are given by $\left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3}\right)$.
	SECTION – C
Q.19	A letter is chosen at random from the English alphabet. Find the probability that the letter chosen (a) is a vowel,(b) is a consonant © precedes P (d) follower r.Ans.(a)5/26 (b) 21/26 (c) 15/26 (d) 4/13
Q.20	A manufacturer of radio sets produced 600 units in the 3rd year and 700 units in the 7th year. Assuming that the production uniformly increases by a fixed number every year. Find (a) the production in the 1st year (b) the total production in 7 years (c) the production in the 10th year. Ans 575,4375,775 OR 228 logs are to be stacked in a store in the following manner : 30 logs in the bottom, 28 in the next row, then 26 and so on. In how many rows can these 228 logs be stacked ? How many logs are there in the last row ? Ans 12 rows, 8logs

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Q.21	A drinking glass open at the top is in the shape of a frustum of a cone of height 24 cm. The diameters of its top and bottom circular ends are 18 cm and 4 cm respectively. Find the capacity and total surface area of the glass. Ans $2587.36cm^3, 863.5cm^2$ OR A hemispherical tank of radius $1\frac{3}{4}$ m is full of water. It is connected with a pipe which empties it at the rate of 7 litres per second. How much time will it take to empty the tank completely ? Ans.1604.16 sec = 26.73 minutes
Q.22	A brooch is made with silver wire in the form of a circle with diameter 35 mm. The wire is also used in making 5 diameters which divide the circle into 10 equal sectors as shown in Fig.. Find : (i) the total length of the silver wire required. (ii) the area of each sector of the brooch.  Ans (i) 285 mm (ii) $Area = \frac{385}{4} mm^2$ OR The area of an equilateral triangle is 1732 .05 cm^2. taking each vertex as centre; a circle is drawn with radius equal to half the length of the side of the triangle. Find the area of the triangle not included in the circles. (Take $\pi = 3.14$ & $\sqrt{3} = 1.73205$). Ans. r = 100 cm side of square = 200 cm & area = 1620 . 51 sq cm
Q.23	From the top of a lighthouse, the angles of depression of two ships on its two sides are observed to be α and β. If the height of the lighthouse is h meters and the line joining the ships passes through the foot of the lighthouse, show that the distance between the ships is $\frac{h(\tan\alpha + \tan\beta)}{\tan\alpha \tan\beta}$.
Q.24	Using A (4,-6), B(3,-2) and C(5,2),verify that a median of the triangle ABC divides it into two triangles of equal areas.
Q.25	PQ is a chord of length 8 cm of a circle of radius 5 cm . The tangent at P & Q intersect at a point T . Find the length of TP . Ans TP = 20 / 3 CM
Q.26	Which term of the sequences 114,109,104 ……is the first negative term ? Ans n = 24^{th} term
Q.27	If centre of circle passing through (a,–8), (b,–9) and (2,1) is (2,–4), find the value of a and b. Ans a = 5,-1 b = 2
Q.28	Prove that the parallelogram circumscribing a circle is a rhombus.
	SECTION – D
Q.29	If the equation $(1+m^2)x^2 + 2mcx + (c^2 - a^2) = 0$ has equal roots, prove that $c^2 = a^2(1 + m^2)$. OR Out of a number of Saras birds, one forth the number are moving about in lotus plants ; 1/9 th coupled (along) with ¼ as well as 7 times the square root of the number move on a hill; 56 birds remain in vakula trees. What is the total number of birds ? Ans Total number of birds = 576 $\frac{x}{4}+\frac{x}{9}+\frac{x}{4}+7\sqrt{x}+56=x$ $x - 18\sqrt{x} - 144 = 0$, $\sqrt{x} = y \Rightarrow y^2 - 18y - 144 = 0$, $y = 24 \Rightarrow x = 576$
Q.30	If S_1, S_2, S_3 be the sum of n, 2n and 3n terms respectively of an A.P. prove that $S_3 = 3(S_2 - S_1)$.
Q.31	A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm. Find its capacity .[Use $\pi = \frac{22}{7}$]. Ans : $V = \frac{4928}{3} = 1642.66cm^3$
Q.32	Draw a triangle ABC with side BC = 7cm, $\angle B = 45^0$, $\angle A = 105^0$, then construct a triangle whose sides are $\frac{3}{5}$ times the corresponding side of ΔABC.

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Q.33	A building is in the form of a right circular cylinder surmounted by a hemispherical dome both having the same base radii. The base diameter of the dome is equal to $\frac{2}{3}$ of the total height of the building. Find the height of the building, if it contains 67 $\frac{1}{21}m^3$ of air. Ans $2m$ OR A copper wire 4 mm in diameter is evenly bound about a cylinder whose length is 24 cm and diameter 20 cm so as to cover the whole surface. Find the length of the wire in terms of π . Ans :Length of wire $= 1200\pi$
Q.34	A man standing on the deck of a ship, which is 10m above the water level, observes the angle of elevation of the top of a hill as 60^0 and the angle of depression of the base of the hill as 30^0. Calculate the distance of the hill from the ship and the height of the hill. $d = 10\sqrt{3} = 17.32; h = 40m$ OR The angle of elevation of a jet fighter from a point A on the ground is 60^0. After a flight of 15seconds, the angle of elevation changes to 30^0. If the jet is flying at a speed of 720 km/hour, find the constant height at which the jet is flying. $1500\sqrt{3}m = 2598$
	_____x_____
	USE SOFT WORDS AND HARD ARGUMENTS.

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