19th Year of quality education

Code No. Series AG-10-1899 TMC -D/79/89/36

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 2010 -11

Time : 3 to $3\frac{1}{2}$ Hours — अधिकतम समय : 3 से $3\frac{1}{2}$

Maximum Marks : 80 — अधिकतम अंक : 80

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

CLASS – X CBSE MATHEMATICS

Section A

Q.1 From the top of a lighthouse 60 metres high with its base at the sea level, the angle of depression of a boat is 30^0. The distance of the boat from the foot of the lighthouse is

(a) $10\sqrt{3}$ m (b) $15\sqrt{3}$ m (c) $20\sqrt{3}$ m (d) none of these Ans.d

Q.2 The sum S of first n even natural numbers is given by the relation s = n(n+1). Find n, if the sum is 420

(A) 20 (B) 22 (C) 18 (D) NONE Ans A

Q.3 In what ratio does the point $\left(\frac{11}{6}, \frac{17}{6}\right)$ divide the join of A (1, 2) and B(3, 4).

(A) 5 : 7 (B) 7 : 5 (C) 2 : 3 (D) NONE Ans A

Q.4 Find the probability that a number selected at random from the numbers 3, 4, 5,…, 25 is prime.

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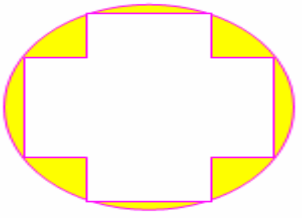
	(A) 9 / 23 (B) 8/ 25 (C) 8 / 23 (D) NONE Ans C
Q.5	The sum of all three digit numbers which are divisible by 7 (A) 7336 (B) 70336 (C) 128 (D) NONE Ans B
Q.6	If tangents PA and PB from a point P to a circle ith centre 0 are inclined to each other at angle of 80^o, then ∠POA is equal to (A) 50° (B) 60° (C) 70° (D) NONE Ans A
Q.7	The angle subtended at the centre of a circle of radius 7 cm, by an arc of length 11 cm? (A) 90 (B) 80 (C) 60 (D) NONE Ans A
Q.8	A right Δ ABC right angled at A drawn to circumscribe a circle of radius 5cm with centre O. If AC = 17cm and AB = 18cm, then OC is equal to (a) 10cm (b) 9cm (c) 12cm (d) 13cm Ans d
Q.9	What is the probability that two friends have different birthdays? (A) 1/365 (B) 364/365 (C) 364 / 366 (D) NONE Ans B
Q.10	Distance between two parallel lines is 14cm. The radius of circle which will touch both two lines is (a) 6cm (b) 7cm (c) 12cm (d) 14cm Ans b
	Section B
Q.11	Using quadratic formula, solve the following equation for x : $abx^2 + (b^2 - ac)x - bc = 0$. Ans $c/b, -b/a$
Q.12	Two concentric circles are of radii 5cm and 3 cm. Find the length of the chord of the larger circle which touches the smaller circle. Ans 8 cm
Q.13	Find the arithmetic progression whose third term is 16 and seventh term exceeds its fifth term by 12. Ans a = 4 ; d = 6 AP: 4 , 10 , 16 , …….
Q.14	Solid cylinder of brass 8 m high and 4 m diameter is melted and recast into a cone of diameter 3 m. Find the height of the cone. Ans 42.66 m
Q.15	AB is a diameter and AC is a chord of a circle such that ∠BAC = 30°. If tangent at C intersects AB produced at D, prove that BC=BD.
Q.16	Find the probability of getting 52 Sunday and Monday in a leap year. Ans 5 / 7
Q.17	The length of minute hand of a clock is 14cm. find the area swept by the minute hand in 5 minutes. Ans $51.33 cm^2$ OR Two equal rectangles are intersecting each other in a circular field. If the dimensions of Rectangular courts are 20 m x 10 m. Find the area of the shaded region  . Ans 92.5 cm
Q.18	If $\frac{2}{3}$, k; $\frac{5k}{8}$ are in A.P., find the value of K. Ans k = 16/33

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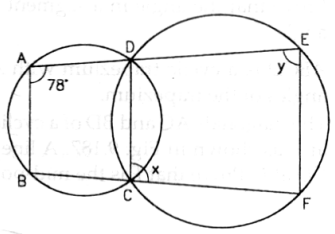
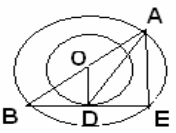
	Section C
Q.19	The shadow of a flagstaff is three times as long as the shadow of the flagstaff when the sun rays meet the ground at an angle of 60^o. Find the angle between the sun rays and the ground at the time of longer shadow. Ans $\theta = 30^0$ OR The angle of elevation of the top Q of a vertical tower PQ from a point X on the ground is 60^o. At a point Y, 40 m vertically above X, the angle of elevation is 45^o. Find the height of the tower PQ and the distance XQ. Ans : Height of Tower PQ = 54. 64 + 40 = 94 . 64 & Distance XQ = $\frac{94.64\times 2}{\sqrt{3}} = 109.3m$
Q.20	If I walked $1km/\ hr$ faster, I would have taken 15 minutes less to walk 3 km. find the rate of my walking. **Ans :** $\frac{3}{x} - \frac{3}{x+1} = \frac{15}{60}$ **3km/h**
Q.21	If the point C(-1,2) divides line segment AB in the ratio 3:4, where the co-ordinates of A are (2,5), find the co-ordinates of B. Ans b = (-5,-2) .
Q.22	In a family, there are three children. Assuming that the chances of a child being a male or female are equal , find the probability that (a) there is one girl in the family (b) there is no male child in the family © there is at least one male child in the family. Ans. (a) 3/8 (b) 1/8 (c) 7/8
Q.23	In fig., ∠BAD = 78^o, ∠DCF = x^o and ∠DEF = y^o. Find the values of x and y. $x = 78^0$ & $y = 102^0$ 
Q.24	If S_1, S_2, S_3 are the sum of n terms of three AP's, the first term of each being unity and the respective common difference being 1, 2 , 3; prove that $S_1 + S_3 = 2S_2$. OR The angles of a quadrilateral are in A.P. whose common difference is 10^0.Find the angles. **Ans** $75^0, 85^0, 95^0, 105^0$
Q.25	The radii of two concentric circles are 13 cm and 8 cm . AB is a diameter of the bigger circle BD is tangent to the smaller circle touching it at D .Find the length of AD .  Length of AD $= \sqrt{361} = 19cm$
Q.26	A metallic bucket is in the shape of a frustum of a cone mounted on a hollow Cylindrical base given in the figure. If the diameters of two circulars ends of the bucket

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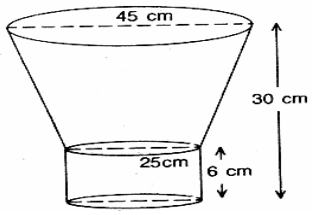
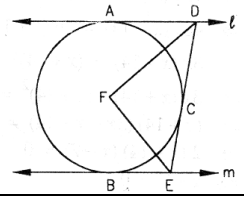
	are 45cm and 25 cm, total vertical height is 30 cm and that of the cylindrical portion is 6 cm, find the area of the metallic sheet used to make the bucket. $\left(\pi = \frac{22}{7}\right)$ Ans: Height of frustum = 30 - 6=24 cm ; Radi of circular end = 22.5 & 12 . 5 ; Slant height = 26 cm ; Area of metallic sheet used = curve surface area of frustum of cone + area of circular base end + curve surface area of cylinder = $1216.25\pi cm^2 = 3822.cm^2$  OR A solid iron pole consists of a cylinder of height 220cm and base diameter 24 cm which is surmounted by another cylinder of height 60 cm and radius 8 cm. Find the mass of the given pole, given that 1 cm^3 of iron has approximately 8g mass. (Use π =3.14) Ans 892 kg, 262.4 gram
Q.27	In fig. I and m are two parallel tangents at A and B. The tangent at C makes an intercept DE between I and m. Prove that $\angle DFE = 90^o$. 
Q.28	Find the coordinates of the points which divide the line segment joining the points (–8, 0) and (4,–8) in four equal parts. Ans (-5,-2),(-2,-4), (1,-6)
	Section D
Q.29	One fourth of a herd of camels was seen in the forest. Twice the square root of the herd had gone to the mountains and the remaining 15 camels were seen on the bank of a river. Find the total number of camels. Ans x = 36, y = 6, y = $-10/3$
Q.30	Draw a triangle ABC with side BC = 7cm, $\angle B = 45^0$, $\angle A = 105^0$, then construct a triangle whose sides are $\frac{5}{3}$ times the corresponding side of ΔABC.
Q.31	There is a small island in between a river 100 meters wide. A tall tree stands on the island P and Q are points directly opposite to each other on the two banks and in line with the tree. If the angles of elevation of the top of the tree from P and Q are 30° and 45° respectively, find the height of tree. Ans $50(\sqrt{3}+1) = 36.6$
Q.32	A well with 10m inside diameter is dug 14 m deep. Earth taken out of it is spread all a round to a width of 5 m to form an embankment. Find the height of embankment. $\frac{7700}{22\times 75} = 4.66m$ **OR**

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	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 1601.5sec OR 26.6*MINUTE*
Q.33	Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.
Q.34	The sum of three numbers in A.P. is 27 and their product is 648. Find the numbers. Ans : 6 , 9 12 OR Find K if the given value of x is the K th term of the given A.P. $5\frac{1}{2}, 11, 16\frac{1}{2}, 22, ..., x = 550$. Ans : k =100
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