## MODEL QUESTION PAPER 2013-14

## MATHEMATICS

## CLASS -X

## Time allowed : 3 hours

Maximum Marks :90

## General Instructions:

(i) All questions are compulsory.
(ii) The question paper consists of 34 questions divided into four sections $A, B, C$ and $D$. Section A comprises of 8 questions of 1 mark each, section B comprises of 6 questions of 2 marks each, section C comprises of 10 questions of 3 marks each and section D comprises 10 questions of 4 marks each.
(iii) Questions numbers 1 to 8 in section -A are multiple choice questions where you are to select one correct option out of the given four.
(iv) There is no overall choice. However, internal choices have been provided in 2 questions of three marks each. You have to attempt only one of the alternatives in all such questions.
(v) Use of calculation is not permitted.

## SECTION - A

## Question numbers 1 to 8 carry one mark each. For each question, four alternative choices

 have been provided of which only one is correct. You have to select the correct choice.1. Value of $K$ for which sum of the roots of the equation $3 x^{2}-(3 x-2) x-(k-6)=0$ is equal to the product of its roots then
a) 1
b) -1
c) 0
d) 2
2. The perimeter of the triangle formed by the points $(0,0),(1,0),(0,1)$ is
a) $1+\sqrt{2}$
b) $\sqrt{2}+1$
c) 3
d) $2+\sqrt{2}$
3. The probability of guessing the correct answer to certain question is $\mathrm{P} / 12$, if the probability of not guessing the correct answer to the same question is $3 / 4$ then the value of $P$ is
a) 4
b) 2
c) 3
d) 1
4. If $p(-1,1)$ is the midpoint of the line segment joining $A(-3,6)$ and $B(1, b+4)$, then $b$ is
a) 1
b) -1
c) 2
d) 0
5. The area of two circle are in the ratio $4: 9$, the ratio of their circumference is
a) $2: 3$
b)
3 :2
c)
4 :9
d) $\quad 9: 4$
6. The no. of two digits that are divisible by 6 is
a) 12
b) 16
c) 15
d) 18
7. The angle of depression of an object from a 60 m high tower is $30^{\circ}$. The distance of the object from the tower is
a) $20 \sqrt{3} \mathrm{~m}$
b) $\quad 60 \sqrt{3} \mathrm{mc}$
$40 \sqrt{3} \mathrm{~m}$
d) 120 m
8. A solid metal cone with radius of base 12 cm and height 24 cm is melted to form solid spherical balls of diameter 6 cm each. The no of balls formed is
a) 16
b) 24
c)
32
d) 28
9. If the roots of the equation $(a-b) x^{2}+(b-c) x+(c-a)=0$ are equal , Prove that $b+c=2 a$.
10. For what value of $P$ are $(2 P+1), 13,(5 P-3)$ three consecutive terms of an A.P.
11. Two tangent segments $B C$ and $B D$ are drawn to a circle with centre $O$ such that $\angle C B D=120^{\circ}$. Prove that $\mathrm{OB}=2 \mathrm{BC}$.

12. A quadrilateral $A B C D$ is drawn to circum scribe a circle , Prove that $A B+C D=A D+B C$.
13. Find the distance between the points ( $5 \sin 60,0$ ) and ( $0,5 \sin 30$ ).
14. If tangents $A B$ and $A C$ from a point $A$ to a circle with centre $O$ are inclined to each other at an angle of $70^{\circ}$, then Find $\angle A O B$.

## SECTION - C (3 marks)

15. Find two consecutive positive integers, the sum of whose squares is 25 .

OR
Solve for $\mathrm{x}, \quad \frac{1}{a+b+x}=\frac{1}{a}+\frac{1}{b}+\frac{1}{x}$
16. If 10 limes the $10^{\text {th }}$ term of an A.P is equal to 15 times the $15^{\text {th }}$ term, show that its $25^{\text {th }}$ term is zero.
(i) What is the relation between a and d.
(ii) Prateek declares that $25^{\text {th }}$ term of the A.P is non zero, do you agree? Which value of Prateek is depicted by his declaration.
17. A 1.5 m tall boy stands at a distance of 3 m from a lamp post and cast a shadow of 4.5 m on the ground. Find the height of the lamp post .
18. The curved surface area of a cylindrical pillar is $264 \mathrm{~m}^{2}$ and its volume is $924 \mathrm{~m}^{3}$, Find the height of the pillar.
19. A person on tour has Rs. 360 for his expenses. If he extends his tour for 4 days, he has to cut down his daily expenses by Rs.3. Find the original duration of the tour.
20. Draw a circle of radius 4.2 cm . Draw a pair of tangents to this circle inclined to each other at an angle $50^{\circ}$.
21. For what value of $P$ for which the points $(-5,1),(1, P)$ and $(4,-2)$ collinear .

OR
The line segment joining the points $A(3,2), B(5,1)$ is divided at the point $P$ in the ratio of 1:2 and $P$ lies on the line $3 x-18 y+k=0$, Find the value of $k$ ?
22. A bag contains 6 red balls and some blue balls. If the probability of drawing blue ball from the bag is twice the probability of drawing a red ball, Find the no. of blue balls.
23. If the radii of the ends of a buckets are 5 cm and 15 cm and 24 cm high, Find its surface area. ( $\Pi$ =3.14)
24. $O A C B$ in a quadrilateral of a circle with centre $O$ and its radius 3.5 cm . If $O D=2 \mathrm{~cm}$, find the area of
(1) Quadrant OACB
(2) Shaded region.
$(\Pi=22 / 7)$


## SECTION - D (4 marks)

25. The sum of the area of two squares is $640 \mathrm{~m}^{2}$. If the difference in their perimeter is 64 m , Find the sides of the two squares.
26. Find the sum of first 25 items of an A.P whose $n^{\text {th }}$ term is given by an $=7-3 n$.
27. Prove that the tangents drawn from an external point of a circle are equal.
28. The angle of elevation of a jet fighter from a point $A$ on the ground is $60^{\circ}$. After a flight of 15 seconds, the angle of elevation changes to $30^{\circ}$. If the jet is flying at a constant height of 1500v3m find
(i) The horizontal distance between the two positions of the jet plane.
(ii) The speed of the jet plane in $\mathrm{km} / \mathrm{h}$
(iii) Hari guesses that the speed of the jet plane is $720 \mathrm{~km} / \mathrm{h}$, how do you appreciate his guess, What is the value you have learnt from his guess ?
29. A sphere of diameter 6 cm is dropped in a right circular cylindrical vessel, partly filled with water. The diameter of the cylindrical vessel is 12 cm . If the sphere is completely submerged in water, by how much will the level of water rise in the cylindrical vessel.
30. In what ratio in the line segment joining the points $A(-6,3)$ and $B(-2,-5)$ divided by the $y$ axis . Also find the co-ordinates of the point of division.
31. A bag contains $11,12,13,14 \ldots . . . . .30$ tickets. A ticket is taken out from the bag at random. Find the probability that number on the drawn ticket is
(a) Multiple of 7
(b) Greater than 15 and a multiple of 5.
32. The area of an equilateral triangle is $49 \sqrt{ } 3 \mathrm{~cm} 2$. Taking each angular point as centre, circles are 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. ( $\sqrt{ } 3=1.73, \Pi=22 / 7$ )
33. A toy is the form of a cone mounted on a hemisphere of common base radius 7 cm . The total height of the toy is 31 cm ,
(i) Find the slant height of the conical part.
(ii) Write the formulas used in this solution.
(iii) Find the total surface area of the toy.
(iv) David says that the height of the conical portion is an even number, is he true? Which value is seen by his statement?
34. A circle touches the sides $B C$ of a $\triangle A B C$ at $P$ and touches $A B$ and $A C$ produced at $Q$ and $R$ as shown in the figure, Show that $A Q=1 / 2 \quad X$ perimeter of $\triangle A B C$.

