TEST PAPER: MATHEMATICS

Time: 120 Minutes **Class: 10th C.B.S.E.**

Max. Marks: 60 Marks **Date: 9th January, 2018**

Marking Scheme: *Three questions carry 10 marks each. Questions have 3 subparts each. Subparts (a) and (b) carry 3 marks each and subpart (c) carries 4 marks.*

Question 1:

a. Find the value of m, when (m+1) x = 3ky + 15= 0 and 5x + ky + 5 = 0 are coincident.
b. Construct a triangle similar to a given ΔABC with sides equal to 5/3 of the corresponding sides of ΔABC.
c. A calf is tied with a rope of length 6 m at the corner of a square grassy lawn of side 20 m. If the length of the rope is increased by 5.5 m, find the increase in area of the grassy lawn in which the calf can graze.

Question 2:

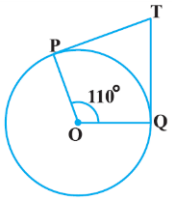
a. A hotel bill for a number of people for overnight stay is Rs.4,800. If there were 4 people more, the bill each person had to pay, would have reduced by Rs.200. find the number of people staying overnight.
b. The LCM and HCF of two numbers are 240 and 12 respectively. If one of the numbers is 60, then find the other number.
c. A trader buys x articles for a total cost of Rs.600.
   - Write down the cost of one article in terms of x. If the cost per article were Rs.5 more, the number of articles that can be bought for Rs.600 would be four less.
   - Write down the equation in terms of x for the above situation and solve it for x.

Question 3:

a. If $x^3 + ax^2 + bx + 6$ has (x-2) as a factor and leaves a remainder of 3 when divided by (x-3), find the value of a and b.
b. If the sum of a certain number of terms of the A.P. 25, 22, 19, … is 116. Find the last term.
c. A line segment joining A $(-1, \frac{5}{3})$ and B (a, 5) is divided in the ratio 1:3 at P, the point where the line segment AB intersects the y-axis.
   (i) Calculate the value of a
   (ii) Calculate the co-ordinates of P.

Question 4:

a. If TP and TQ are the two tangents to a circle with centre O so that ∠ POQ = 110°, then find ∠ PTQ.



b. A hemispherical bowl of diameter 7.2 cm is filled completely with chocolate sauce. This sauce is poured into an inverted cone of radius 4.8 cm. Find the height of the cone if it is completely filled.
c. A hollow sphere of internal and external diameters 4 cm and 8 cm respectively is melted into a cone of base diameter 8 cm. Find the height of the cone.

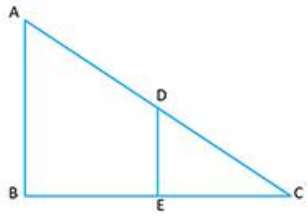
Question 5:

a. The percentage marks obtained by 100 students in an examination are given below: Find median.

Marks	30-35	35-40	40-45	45-50	50-55	55-60	60-65
Frequency	10	16	18	23	18	8	7

b. A jar contains 24 marbles, some are green and others are blue. If a marble is drawn at random from the jar, the probability that it is green is $\frac{2}{3}$. · Find the number of blue balls in the jar.

c. In the given figure, AB and DE are perpendicular to BC. If AB = 9 cm, DE=3 cm and AC=24 cm, calculate AD.



Question 6:

a. Prove: $(1 - \tan A)^2 + (1 + \tan A)^2 = 2\sec^2 A$

b. A man in a boat rowing away from a lighthouse 150 m high, takes 2 minutes to change the angle of elevation of the top of the lighthouse from 60° to 45°. Find the speed of the boat.

c. The marks obtained by 30 students of Class X of a certain school in a Mathematics paper consisting of 100 marks are presented in table below. Find the mean of the marks obtained by the students using step-deviation method.

Marks obtained (x_i)	10	20	36	40	50	56	60	70	72	80	88	92	95
Number of student (f_i)	1	1	3	4	3	2	4	4	1	1	2	3	1