SECTION A

1. Find the value of k for which the roots of the quadratic equation $(k-5)x^2 + 2(k-5)x + 2 = 0$ are equal.

2. Find the value of y for which the distance between the points $(2, -3)$ and $(10, y)$ is 10 units.

3. Write whether the rational number 13/3125 has a decimal expansion which is terminating or non-terminating repeating.

4. Write the nth term of the A.P $1/k,\ (1+k)/k,\ (1+2k)/k$.

5. If $\sin\theta + \cos\theta = \sqrt{2}\cos(90° - \theta)$, find the value of $\cot\theta$.

6. DE is drawn parallel to the base BC of triangle ABC, meeting AB at D and AC at E. If $AB/CD = 4$ and $CE = 2$ cm, find AE.

SECTION B

1. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is three times that of the red ball, find the number of blue balls.

2. The 5th and 15th terms of an A.P are 13 and -17. Find the sum of the first 21 terms of the A.P.

3. Using Euclid's Division Algorithm, find the HCF of 225 and 867.

4. If the point $(0, 2)$ is equidistant from the points $(3, k)$ and $(k, 5)$, find the value of k.

5. Find the value of a for which the pair of linear equations $2x + 3y = 7$ and $4x + ay = 14$ has infinitely many solutions.

SECTION C

1. Show that any positive odd integer is of the form $4q + 1$ or $4q + 3$.

2. The tens digit of a number is twice its units digit. The number obtained by interchanging the digits is 36 less than the original number. Find the original number.

3. (i) The line segment joining the points $A(2, 1)$ and $B(5, -8)$ is trisected at points P and Q. If P lies on the line $2x - y + k = 0$, find k.

OR

(ii) The x-coordinate of a point is twice its y-coordinate. If the point is equidistant from $(2, -5)$ and $(-3, 6)$, find its coordinates.

4. Show that 1, 1/2 and -2 are the zeroes of the polynomial $2x^3 + x^2 - 5x + 2$.

5. Prove that the angle between two tangents drawn from an external point to a circle is supplementary to the angle subtended at the centre.

6. S and T are points on sides PR and QR of triangle PQR such that angle P equals angle RTS. Show that triangle RPQ is similar to triangle RTS.