Note:-
1. All Questions are compulsory.
2. Numbers on the right indicate full marks.

Section A

Q.1 Select and write the correct answer. **(4)**

1. If the two lines $ax^2 + 2hxy + by^2 = 0$ make angles α and β with X-axis, then tan $(\alpha + \beta)$ = _____

   A) $\dfrac{h}{a + b}$ 　　 B) $\dfrac{h}{a - b}$

   C) $\dfrac{2h}{a + b}$ 　　 D) $\dfrac{2h}{a - b}$

2. If acute angle between lines $ax^2 + 2hxy + by^2 = 0$ is, $\dfrac{\pi}{4}$ then $4h^2$ = _____

Q.2 Answer the following.
(3)

1. Find the separate equation of the line represented by equation $3x^2 - y^2 = 0$

2. Find the joint equation of line passing through (3,2) and parallel to the line x = 2 and y = 3

3. Find the separate equation of the line $3y^2 + 7xy = 0$

Section B
Attempt any Four

Q.3　Find k if the sum of the slope of the line given by $x^2 + kxy - 3y^2 = 0$ is equal to their product. **(2)**

Q.4　Show that $x^2 + 7xy - 2y^2 = 0$ represent a pair of line. **(2)**

Q.5　Find the joint equation of pair of line passing through (2, –3) and parallel to $x^2 + xy - y^2 = 0$ **(2)**

Q.6　Find combined equation of given pair of lines x + 2y – 1 = 0 and x – 3y + 2 = 0 **(2)**

Q.7　Find the co-ordinates of the points of intersection of the lines represented by $x^2 - y^2 - 2x + 1 = 0$ **(2)**

Q.8　Show that $x^2 - y^2 = 0$ represent a pair of line. **(2)**

Section C
Attempt any Two

Q.9　Find the measure of acute angle between the line represented by $2x^2 + 7xy + 3y^2 = 0$ **(3)**

Q.10　If the line represented by $ax^2 + 2hxy + by^2 = 0$ make angles of equal measures with the co-ordinate axes then show that a = ±b **(3)**

Q.11 Find the combined equation of a pair of lines passing through the origin and perpendicular to **(3)** the lines represented by $5x^2 - 8xy + 3y^2 = 0$

Section D
Attempt any One

Q.12 Prove that the product of length of perpendiculars from $P(x_1, y_1)$ to the lines represented by **(4)** $ax^2 + 2hxy + by^2 = 0$ is $\left| \dfrac{ax_1^2 + 2hx_1y_1 + by_1^2}{\sqrt{(a-b)^2 + 4h^2}} \right|$

Q.13 Find the joint equation of pair of line through the origin each of which make an angle of $60°$ **(4)** with the Y-axis.