UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / First Semester – Spring 2023

Roll No. .....

Paper: Business Mathematics **Course Code: MATH-112** **Time: 3 Hrs.** **Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Solve the following: **(5x6=30)**

(i) Solve $\frac{2}{2x+1} - \frac{3}{2x-1} = \frac{-2x+7}{4x^2-1}$.

(ii) Solve graphically and simultaneously the equations $5x + 7y = 35$ and $-x + 3y = 3$.

(iii) A shopping mall at Lahore holding a clearance sale advertises that all prices have been discounted 20%. If a shirt is on sale for Rs. 2560. What was its presale (actual) price.

(iv) Insert four real geometric means between 3 and 96.

(v) Twenty children were sharing equally the cost of a present for their teacher. When 4 of the children decided not to contribute, each of the other children had to pay $1.50 more. How much did the present cost, in dollars.

Q.2. Solve the following. **(5x6=30)**

(a) Show that $\begin{vmatrix} b+c & a & a^2 \\ c+a & b & b^2 \\ a+b & c & c^2 \end{vmatrix} = (a+b+c)(a-b)(b-c)(c-a)$

(b) Solve the following system of linear equations.

$3x + y - z = -4$

$x + y - 2z = -4$

$-x + 2y - z = 1$

(c) Find the five numbers in A.P. whose sum is 25 and the sum of whose squares is 135.

(d) How many arrangements of the letters of the word **ATTACKED** can be made, if each arrangement begins with **C** and ends with **K**.

(e) Find the present value, amount and interest of an annuity of Rs. 200 for 12 years if the rate of interest is 3% per annum.