



UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program : Third Semester – Fall 2021

Roll No.

Paper: Mathematics.

Course Code: MATH-207

Time: 3 Hrs. Marks: 60

Q.1. Solve the following:

(5x6=30)

- (i) Solve $4^{1+x} + 4^{1-x} = 10$.
- (ii) If $\frac{1}{a}, \frac{1}{b}$ and $\frac{1}{c}$ are in G.P. Show that common ratio is $\pm \sqrt{\frac{a}{c}}$.
- (iii) Solve $(a+b)x^2 + (a+2b+c)x + (b+c) = 0$.
- (iv) Expand and simplify $(a + \sqrt{2}x)^4 + (a - \sqrt{2}x)^4$.
- (v) If $\cot \theta = \frac{5}{2}$ and the terminal arm of the angle is in the first quadrant. Then find the value of $\frac{3 \sin \theta + 4 \cos \theta}{\cos \theta - \sin \theta}$.

Q.2. Solve the following:

(5x6=30)

- (a) Show that $\begin{vmatrix} a+l & a & a \\ a & a+l & a \\ a & a & a+l \end{vmatrix} = l^2(3a+l)$
- (b) Solve the following system of linear equations.
 $x - 2y + z = -1$
 $3x + y - 2z = 4$
 $y - z = 1$
- (c) If the 6th term of an arithmetic progression (A.P) is 19 and 9th term of is 31. Then find the n th term and 18th term.
- (d) Expand and simplify by using binomial theorem $(\frac{x}{2} - \frac{2}{x^2})^6$.
- (e) Prove that $\frac{\cos \theta + \sin \theta}{\cos \theta - \sin \theta} + \frac{\cos \theta - \sin \theta}{\cos \theta + \sin \theta} = \frac{2}{1 - 2 \sin^2 \theta}$.