Answer any five questions:

1. If the second term and fifth term of an AP are 7 and 19 respectively, find the tenth term and the sum of the first ten terms.   5

2. If a, b, c are the pth, q^{th} and r^{th} terms of a A.P., then show that   5
$$a^{q-r}.b^{r-p}.c^{p-q} = 1$$

3. Solve the following equations: 2+3=5
   a) $2x^2 - 7x + 6 = 0$
   b) $x^4 - 10x^2 + 9 = 0$

4. Examine whether the three points (4, 2), (7,5) and (9,7) are collinear or not.   5

5. What is the angle between the lines $x - 2y = 4$ and $y - 3x + 7 = 0$. Also find the slope of the line joining the points (-9, 3) and (-3, 6).   3+2=5

6. Derive an equation of a line in the intercept form.   5

7. (a) What do you mean by a determinant?   2
   (b) What do you mean by Cartesian coordinates?   2
   (c) Define a rational number.   1

8. (a) Write two properties of a determinant.   2
   (b) Prove that: $\begin{vmatrix} a & b & c \\ a^2 & b^2 & c^2 \\ a^3 & b^3 & c^3 \end{vmatrix} = abc(a - b)(b - c)(c - a)$ 3

9. Find the inverse of the following matrix: 5
$$A = \begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$$
   5

10. Solve by Cramer's rule: 5
$$2x + y + z = 1$$
$$x - y + 2z = -1$$
$$3x + 2y - z = 4$$

11. (a) If $y = f(x) = \frac{x+1}{x+2}$, then what is the value of $f\left(\frac{1}{x}\right)$?   2
    (b) Find the value of   3
$$\lim_{x \to 2} \frac{x^2 - 3x + 2}{x^2 + x - 6}$$

12. Describe in your own words about the importance of calculus in business and commerce.   5

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