SECTION – A (1 marks each)

1. Which term of the AP 72, 63, 54, …… is 0?
   (a) 8th          (b) 9th          (c) 11th          (d) 12th
2. A man receives Rs. 60 for the first week and Rs. 3 more each week than the preceding week. How much does he earn by the 20th week?
   (a) Rs. 1760      (b) Rs. 1770      (c) Rs. 1780      (d) Rs. 1790
3. The value of \(\sqrt{6 + \sqrt{6 + \sqrt{6 + \ldots}}}\) is
   (a) 4          (b) 3          (c) –2          (d) \(\frac{7}{2}\)
4. Find the values of k for which the quadratic equation \((k – 12)x^2 + 2(k – 12)x + 2 = 0\) has real and equal roots.
   (a) k = 0 or k = 14  (b) k = 12 or k = 24  (c) k = 14 or k = 12  (d) k = 1 or k = 12
5. If the pair of equations \(2x + 3y = 7\) and \(kx + \frac{9}{2}y = 12\) have no solution, then the value of k is:
   (a) \(\frac{2}{3}\)    (b) –3        (c) 3          (d) \(\frac{3}{2}\)
6. The solution of the equations \(x + y = 14\) and \(x – y = 4\) is
   (a) \(x = 9\) and \(y = 5\)  (b) \(x = 5\) and \(y = 9\)  (c) \(x = 7\) and \(y = 7\)  (d) \(x = 10\) and \(y = 4\)
7. The number of zeroes of the polynomial from the graph is
   (a) 0          (b) 1          (c) 2          (d) 3
8. A number when divided by 61 gives 27 quotient and 32 as remainder is
   (a) 1679        (b) 1664       (c) 1449       (d) none of these
9. The relationship between the zeroes & coefficients of the quadratic polynomial $ax^2 + bx + c$ is (a) $\alpha + \beta = \frac{c}{a}$  
(b) $\alpha + \beta = -\frac{b}{a}$  
(c) $\alpha + \beta = -\frac{c}{a}$  
(d) $\alpha + \beta = \frac{b}{a}$

10. The product of L.C.M and H.C.F. of two numbers is equal to 
(a) Sum of numbers  
(b) Difference of numbers  
(c) Product of numbers  
(d) Quotients of numbers

SECTION – B(2 marks each)

11. Determine the smallest 3-digit number which is exactly divisible by 6, 8 and 12.

12. If the sum of first n terms of an A.P. is given by $S_n = 3n^2 + 5n$, find the nth term of the A.P.

13. Find a quadratic polynomial whose zeroes are 2 and –3.

SECTION – C(3 marks each)

14. Show that any positive odd integer is of the form $6q + 1$ or $6q + 3$ or $6q + 5$ where $q \in Z$.

15. A fraction becomes $\frac{9}{11}$, if 2 is added to both the numerator and the denominator. If 3 is added to both the numerator and the denominator it becomes $\frac{5}{6}$. Find the fraction.

16. Solve: $\frac{x-3}{x+3} - \frac{x+3}{x-3} = 6 - \frac{6}{7}$, $(x \neq -3, 3)$

17. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the sum of first n terms.

SECTION – D(4 marks each)

18. Obtain all the zeroes of $3x^4 + 6x^3 - 2x^2 - 10x - 5$, if two of its zeroes are $\frac{\sqrt{5}}{3}$ and $-\frac{\sqrt{5}}{3}$.

19. Solve the following system of linear equations graphically: $2x + y - 5 = 0$; $x + y - 3 = 0$. Find the points where these lines meet the y-axis.

20. A pole has to be erected at a point on the boundary of a circular park of diameter 13 metres in such a way that the differences of its distances from two diametrically opposite fixed gates A and B on the boundary is 7 metres. Is it possible to do so? If yes, at what distances from the two gates should the pole be erected?