

Class: 10
Time : 3hrs

F.M.: 75

Subject: O.Math

Attempt all the questions

Group 'A'

[5 × 2 = 10]

1. a) What is the y-intercept of $y = \sin x$?

b) Which range of the functions between f and g is equal to the range of the functions $\text{gof}(x)$?

2.a) Define composite function with an example .

b) If a polynomial $q(x)$ is divided by $(x-b)$, what will be its remainder?

3.a) If $f(x) = q(x) \times d(x) + r(x)$, write the meaning of each term.

b) Define factor theorem.

4.a) State the meaning of each term in the formula : $t_n = a + (n-1)d$.

b) Write the sum of n terms of arithmetic sequence whose first term 'P' and the last term 'q' .

5.a) What is the geometric mean between two positive numbers m and n ?
Write it .

b) Write the meaning of each term in the formula $s_n = \frac{a(r^n - 1)}{r - 1}$

Group B (4x4= 16)

6. a) If $f = \{(3,4), (4,5), (5,6)\}$ and $g = \{(2,3), (3,4), (4,5)\}$ express fog in an ordered pair form.

b) If $f(x) = 3x+7$, Find the value of $\text{ff}(2)$.

7. a) If $f: x \rightarrow 3x+p$ and $\text{ff}(2)=12$, find the value of P .

b) If $2x^3 - 6x^2 + 3 = (-2)xQ(x) + R$, Find $Q(x)$ and R using synthetic division method.

8.a) If $(x-7)$ is a factor of polynomial $f(x) = x^3 - 9x^2 + (k+1)x - 7$, find the value of k .

b) How many terms are there in the series $5+9+13+\dots+77$? find .

9.a) If $5, p, q, 11$ is an arithmetic sequence .Find the values of x and y .

b) If $a+2$, $a+8$ and $17+a$ are in geometric sequence, find the value of a .

Group C 11x3=33

10 . If $f(x) = 3x+4$ and $g(x) = 2x+2$ then prove that $(\text{fog})(x) = (\text{gof})(x)$

11. If $f(x) = 3x-2$ and $\text{fog}(x) = 6x-2$ then find value of x such that $\text{gof}(x) = 8$.

12. If $f(x) = 2x-5$, $g(x) = 3x+1$ are two functions, find $gf^{-1}(5)$

13. If $f(x) = 2x-5$, $g(x) = \frac{3x+5}{2}$ and $\text{ff}(x) = g^{-1}(x)$, then find the value of x .

14. Solve : $x^3 - 4x^2 - 7x + 10 = 0$

15. Find the value of n where $y = x^3 - 4x^2 + x + 8$ and $y=2$

16. The third term and the 13th term of an arithmetic sequence are -40 and 0 respectively , what is the 28th term of the sequence?

17. If the fourth term of an AP is 1 and the sum of its first eight terms is 18, find the tenth term of the series.

18. A person pays a loan of Rs.975 in monthly installments , each installment being less than the former by Rs 5 . The amount of first installment is Rs .100 . In how many installment will the entire amount be paid ?

19. Some geometric means are inserted between 2 and 32. Find the number of means between the numbers if second mean is 8.

20. If the third and seventh terms of a geometric series are 8 and 128 respectively , Find the sum of its first 1 terms.

Group D 4x4=16

21. If $f(x) = 3x + a$ and $\text{fof}(6) = 10$ find the values of a and $f^{-1}(4)$.

22. If $2x^3 - 5x + a$ and $x^3 - x^2 + ax + 5$ leave equal remainder when divided by $(x+2)$, find the value of a .

23. There are n arithmetic means between 4 and 24. if the ratio of third mean to the last mean is 4:5 then find the number of terms in the series.

24. The sum of three terms in an arithmetic series is 24. If 1,6 and 18 are added to them respectively , the result are in geometrical series , Find the terms.

The End