

Class: 10

Time : 3hrs

Subject: O.Math

F.M.: 75

Attempt all the questions

Group 'A'

[ $5 \times 2 = 10$ ]

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  $gof(x)$  ?

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  $ff(2)$  .

7. a) If  $f: x \rightarrow 3x+p$  and  $ff(2)=12$ , 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  $11 \times 3 = 33$

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

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

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  $ff(x) = g^{-1}(x)$  , 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 installments 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  $4 \times 4 = 16$

21. If  $f(x) = 3x + a$  and  $fof(6) = 10$  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**