



RK VISION ACADEMY

NEET | IIT – JEE | FOUNDATIONS

MATRIC PRACTICE PAPER (2024)

(Mathematics)

Grade: X
Chapter: Numbers and Sequences

Marks: 50 marks
Time: 90 minutes

SECTION A

(8x1=8)

Choose the correct option.

- Given $F_1=1$, $F_2=3$ and $F_n=F_{n-1}+F_{n-2}$, then F_5 is:
(a) 3 (b) 5 (c) 8 (d) 11
- If the sequence t_1, t_2, t_3, \dots are in A.P., then the sequence $t_6, t_{12}, t_{18}, \dots$ is
(a) a Geometric Progression
(b) an Arithmetic Progression
(c) neither an Arithmetic Progression nor Geometric Progression
(d) a constant sequence
- Using Euclid's division lemma, if the cube of any positive integer is divided by 9, then the possible remainders are:
(a) 0,1,8 (b) 1,4,8 (c) 0,1,3 (d) 1,3,5
- If $A=2^{65}$, $B=2^{64}+2^{63}+2^{62}+\dots+2^0$, which of the following is true?
(a) B is 2^{64} more than A
(b) A and B are equal
(c) B is larger than A by 1
(d) A is larger than B by 1
- If HCF of 65 and 117 is expressible in the form of $65m-117$, then the value of 'm' is
(a) 4 (b) 2 (c) 1 (d) 3
- If t_n is the n^{th} term of an A.P., then $t_{8n}-t_n$ is:
(a) $(8n-1)d$ (b) $(8n-2)d$ (c) $(7n-2)d$ (d) $7nd$
- The value of $(1^3+2^3+3^3+\dots+15^3)-(1+2+3+\dots+15)$ is
(a) 14400 (b) 14200 (c) 14280 (d) 14520

8. An A.P. consists of 31 terms. If its 16th term is m, then the sum of all the terms of this A.P. is
- (a) 16m (b) 62m (c) 31m (d) $\frac{31}{2}m$

SECTION B

(6x2=12)

Answer **any 6** questions. Question No. **15** is **compulsory**.

9. If $13824=2^a \times 3^b$, then find 'a' and 'b'.
10. Which term of an A.P. 16,11,6,1,..... is -54?
11. Find x so that x+6, x+12 and x+15 are consecutive terms of a Geometric Progression.
12. If $p^2 \times q^1 \times r^4 \times s^3 = 3,15,000$, then find p,q,r and s.
13. If m,n are natural numbers, for what values of m, does $2^n \times 5^m$ end in 5?
14. Find the 3rd and 4th term of a sequence, if
- $$a_n = \begin{cases} n^2, & \text{if } n \text{ is odd} \\ \frac{n^2}{2}, & \text{if } n \text{ is even} \end{cases}$$
15. Find the value of $1^2+2^2+3^2+\dots+10^2$ and hence deduce $2^2+4^2+6^2+\dots+20^2$.

SECTION C

(6x5=30)

Answer **any 6** questions. Question No. **22** is **compulsory**.

16. Find the sum of all natural numbers between 100 and 1000 which are divisible by 11.
17. The houses of a street are numbered from 1 to 49. Senthil's house is numbered such that the sum of numbers of the houses prior to Senthil's house is equal to the sum of numbers of the houses following Senthil's house. Find Senthil's house number.
18. Find the sum to n terms of the series $5+55+555+\dots$

19. If 1^{th} , m^{th} and n^{th} terms of an A.P. are x, y, z respectively, show that :

(i) $x(m-n) + y(n-1) + z(1-m) = 0$

(ii) $(x-y)n + (y-z)1 + (z-x)m = 0$

20. The ratio of 6^{th} and 8^{th} term of an A.P. is 7:9. Find the ratio of 9^{th} and 13^{th} term.

21. Kala and Vani are friends. Kala says, "Today is my birthday" and she asks Vani, "When will you celebrate your Birthday?" Vani replies, "Today is Monday and I celebrated my birthday 75 days ago". Find the day when Vani celebrated her birthday.

22. Find the sum of the series $(2^3-1^3) + (4^3-3^3) + (6^3-5^3) + \dots$ to

(i) n terms (ii) 8 terms