Model Question Paper

Sequences and Series of real numbers - Part IV

10th Standard

Maths

Reg.No. : | | | | | | |

I.Answer all the questions.
II.Use Blue pen only.
III.Question No 19 is compulsory

Time : 01:00:00 Hrs

Total Marks : 70

Section-A

4 x 1 = 4

1) If x, 2x + 2, 3x + 3 are in G.P, then 5x, 10x + 10, 15x + 15.... form

   (a) an A.P. (b) a G.P. (c) a constant sequence (d) neither A.P. nor a G.P.

2) The sequence $-3, -3, -3, \cdots is$

   (a) an A.P. only (b) a G.P. only (c) neither A.P. nor G.P (d) both A.P. and G.P.

3) If the product of the first four consecutive terms of a G.P is 256 and if the common ratio is 4 and the first term is positive, then its 3rd term is

   (a) 8 (b) $\frac{1}{16}$ (c) $\frac{1}{32}$ (d) 16

4) In a G.P, $t_2 = \frac{3}{5}$ and $t_3 = \frac{1}{5}$. Then the common ratio is

   (a) $\frac{1}{5}$ (b) $\frac{1}{3}$ (c) 1 (d) 5

Section-B

7 x 2 = 14

5) Which term of the arithmetic sequence $24, \quad 23\frac{1}{4}, \quad 22\frac{1}{2}, \quad 21\frac{3}{4}, \cdots . \quad is \quad 3?$

6) Find the 12^{th} term of the A.P. $\sqrt{2}, 3\sqrt{2}, 5\sqrt{2}, \cdots .$

7) Find the 17^{th} term of the A.P. $4, 9, 14, \cdots .$

8) How many terms are there in the following Arithmetic Progressions?
   $-1, -\frac{5}{6}, -\frac{2}{3}, \cdots, \frac{10}{3}.$

9) How many two digit numbers are divisible by 13?

10) A man has saved Rs.640 during the first month, Rs.720 in the second month and RS.800 in the third month. If he continues his savings in this sequence, what will be his savings in the 25^{th}month?

11) A person has deposited Rs.25,000 in an investment which yields 14% simple interest annually. Do these amounts (principal + interest) form an A.P.? If so, determine the amount of investment after 20 years.

Section-C

8 x 5 = 40

12) The sum of three consecutive terms in an A.P. is 6 and their product is –120. Find the three numbers.

13) Find the three consecutive terms in an A. P. whose sum is 18 and the sum of their squares is 140.

14) If m times the m^{th} term of an A.P. is equal to n times its n^{th} term, then show that the $(m+n)^{th}$ term of the A.P. is zero.

15) If a^2, b^2, c^2 are in A.P. then show that $\frac{1}{b+c}, \frac{1}{c+a}, \frac{1}{a+b}$ are also in A.P.

16) If $a^x = b^y = c^z, x \neq 0, y \neq 0, z \neq 0 \quad and \quad b^2 = ac$, then show $\frac{1}{x}, \frac{1}{y}, \frac{1}{z}$ are in A.P.

17) If the geometric sequences $162, 54, 18, \cdots . \quad and \quad \frac{2}{81}, \frac{2}{27}, \frac{2}{9}, \cdots$ have their n^{th} term equal, find the value of n.

18) The sum of three terms of a geometric sequence is $\frac{39}{10}$ and their product is 1. Find the common ratio and the terms.

19) a) If the product of three consecutive terms in G.P. is 216 and sum of their products in pairs is 156. Find them.

(OR)

   b) Find the first three consecutive terms in G.P. whose sum is 7 and the sum of their reciprocals is $\frac{7}{4}$

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