O. P. JINDAL SCHOOL, RAIGARH (CG) 496 001, INDIA

Phone: 07762-227042, 227293, (Extn. 227001 - 49801, 02, 04, 06, 09); Fax: 07762-262613; website: www.opjsrgh.in; e-mail: opjsraigarh@jspl.com

CLASS: XI MATHEMATICS
TOPICS - SEQUENCE & SERIES

1 Let $a_1, a_2, a_3, \ldots$ be in harmonic progression with $a_1 = 5$ and $a_{20} = 25$. The least positive integer n for which $a_n<0$ is

(a) 22 (b) 23 (C) 24 (d)25

2 If $10^9 +2(11)^1(10)^8 + 3(11)^2(10)^7+\ldots + 10\,(11)^9 = k(10)^9$, then k is equal to

(a) 121/10 (b) 441/100 (c) 100 (d)110

3 Three positive numbers form an increasing GP. If the middle term of the GP is doubled, then new numbers are in AP. Then the common ratio of the GP is

(a) $\sqrt{2}+\sqrt{3}$ (b) $3+\sqrt{2}$ (c)$2-\sqrt{3}$ (d) $2+\sqrt{3}$

4 Let $S_n = \sum_1^{4n}(-1)^{\frac{k(k+1)}{2}}k^2$. Then S_n can take the values

(a) 1056 (b) 1088 (c) 1120 (d)1334

5 The sum of the series 1 -3 + 5 – 7 + 9 – 11 +…. is

(a) $\pm n$ (b) n (c) -n (d)none of these

6 The sum of three consecutive terms in AP is 27 and the sum of their squares is 293, then the three terms are

(a) 6,11,16 (b) 4,9,14 (c)2,7,12 (d)8,13,18

7 The common difference of an AP whose first term is 100 and the sum of whose first six terms is five times the sum of next six terms is

(a) 10 (b) -10 (c) 12 $(d)\pm 10$

8 If S_p denotes the sum of the series $1 + r^p + r^{2p} +\ldots$ and s_p denotes the sum of the series $1 – r^p + r^{2p} -\ldots$ (assume $|r| < 1$) ,then $S_p + s_p$ is

(a) 419/10 (b) 420/10 (c)418/10 (d)417/10

9 The sum to n term of the series $\frac{1}{1+1^2+1^4}+\frac{2}{1+2^2+2^4}+\frac{3}{1+3^2+3^4}+\cdots$ is

(a) $\frac{n^2+n}{2(n^2+n+1)}$ (b) $\frac{n^2}{2(n^2+n+1)}$ (c) $\frac{n}{2(n^2+n+1)}$ (d) $\frac{n^2+n}{(n^2+n+1)}$

10 The sum of infinite term of the series $\frac{1}{2\cdot4}+\frac{1}{4\cdot6}+\frac{1}{6\cdot8}+\frac{1}{8\cdot10}+\cdots$ is

(a) $\frac{1}{4}$ (b) $\frac{3}{4}$ (c) $\frac{7}{4}$ (c) $\frac{5}{4}$

11 If a, b, c, d, e, f are in AP ,then e-c is equal to

(a) 2(c-a) (b) 2(d-c) (c)f-e (d) d-c

12 If the roots of the cubic equation $ax^3 +bx^2 +cx +d =0$ are in GP , then

(a) $c^3a =b^3d$ (b) $ca^3 = bd^3$ (c)$a^3b =c^3d$ (d)$ab^3 = cd^3$

13 If a ,b ,c, d, x are real roots of the equation $(a^2 +b^2 +c^2)x^2 -2(ab + bc + cd)x + (b^2 +c^2 +d^2) =0$ real and equal then a, b, c, d are in

(a) AP (b) GP (C) HP (d)None of these

14 If a ,8 ,b are in AP , a ,4 ,b are in GP and a ,x, b are in HP ,then x =

(a) 2 (b) 1 (c)4 (d)16

15 If t^n denotes n^{th} term of the series 2 + 3 + 3 + 6 + 11 + 18 + …, then t_{50}

(a) $2 + 49^2$ (b) $2 + 48^2$ (c)$2 + 50^2$ (d)$2 + 51^2$

16 If cos(x-y) ,cosx , cos(x +y) are in HP , then the value of cosx sec(y/2) is

(a) $\pm\sqrt{3}$ (b) $\pm\sqrt{2}$ (c)± 2 $(d)\pm 1$

17 If the sum to infinity of the series $1 + 2r + 3r^2 + 4r^3 + \ldots$ is 9/4 , then the value of r is

(a) 1/2 (b) 1/3 (c)1/4 (d)none of these

18 The sum to n term of the series $\frac{3}{1^2} + \frac{5}{1^2+2^2} + \frac{7}{1^2+2^2+3^2} + \cdots$ is

(a) 100/17 (b) 150/17 (c)200/51 (d)50/17

19 The number of common terms of two AP's 2 ,7, 12, 17,…. 500 terms and 1 ,8, 15 ,22 , … 300 terms is

(a) 58 (b) 60 (c)61 (d)63

20 H_1 , H_2 are 2 HM's between a ,b ,then $\frac{H_1+H_2}{H_1H_2}$ =

(a) $\frac{ab}{a+b}$ (b) $\frac{a+b}{ab}$ (c) $\frac{ab}{a-b}$ $(d)\frac{a-b}{ab}$