PROGRESSION MOCK 1

1. If the sum of n terms of an AP is $2n^2 + 5n$, then its nth term is-

(A) 4n-3 (B) 4n + 3
(C) 3n + 4 (D) 3n – 4

2. If the ratio of sum of n terms of two A.P's is (3n + 8) : (7n + 15), then the ratio of 12^{th} terms is-

(A) 16 : 7 (B) 7 :16
(C) 7 : 12 (D) 12 : 5

3. If the ratio of the sum of n terms of two AP's is 2n : (n + 1), then ratio of their 8^{th} terms is-

(A) 15 : 8 (B) 8 : 13
(C) n : (n – 1) (D) 5 : 17

4. If $a^2 (b + c)$, $b^2 (c + a)$, $c^2 (a + b)$ are in A.P., then a, b, c, are in-

(A) A.P. (B) G.P.
(C) H.P. (D) None of these

5. If a, b, c are in A.P., then

$\frac{1}{\sqrt{b}+\sqrt{c}}, \frac{1}{\sqrt{c}+\sqrt{a}}, \frac{1}{\sqrt{a}+\sqrt{b}}$ are in-

(A) A.P. (B) G.P.
(C) H.P. (D) None of these

6. A geometric progression consists of an even number of terms. The sum of all the terms is three times that of the odd terms, the common ratio of the progression will be -

(A) 1/2 (B) 2 (C) 3 (D) 1/3

7. If first term of a decreasing infinite G.P. is 1 and sum is S, then sum of squares of its terms is -

(A) S^2 (B) $1/S^2$
(C) $S^2/(2S – 1)$ (D) $S^2/(2S + 1)$

8. If the product of three numbers in GP is 3375 and their sum is 65, then the smallest of these numbers is -

(A) 3 (B) 5 (C) 4 (D) 6

9. The A.M. of two numbers is 34 and GM is 16, the numbers are-

(A) 2 and 64 (B) 64 and 3
(C) 64 and 4 (D) None of these

10. Two numbers are in the ratio 4 : 1. If their AM exceeds their GM by 2, then the numbers are-

(A) 4, 1 (B) 16, 4
(C) 12, 3 (D) None of these

11. $1+2(1+1/n) + 3(1+1/n)^2 + \ldots \infty$ terms, equals-

(A) n (1+1/n) (B) n^2
(C) $n(1+1/n)^2$ (D) None of these

12. The sum to infinity of the series

$1+\frac{2}{3}+\frac{6}{3^2}+\frac{10}{3^3}+\frac{14}{3^4}+\ldots\ldots$

(A) 2 (B) 3 (C) 4 (D) 6

13. If fourth term of an HP is 3/5 and its 8^{th} term is 1/3, then its first term is–

(A) 2/3 (B) 3/2
(C) 1/4 (D) None of these

14. The fifth term of the H.P. 2, $2\frac{1}{2}$, $3\frac{1}{3}$,...... will be -

(A) $5\frac{1}{5}$ (B) $3\frac{1}{5}$ (C) $\frac{1}{10}$ (D) 10

15. If first and second terms of a HP are a and b, then its n^{th} term will be-

(A) $\frac{ab}{a+(n-1)ab}$ (B) $\frac{ab}{b+(n-1)(a+b)}$

(C) $\frac{ab}{b+(n-1)(a-b)}$ (D) None of these

16. If sum of A.M. and H.M. between two positive numbers is 25 and their GM is 12, then sum of numbers is-

(A) 9 (B) 18

(C) 32 (D) 18 or 32

17. The A.M. between two positive numbers exceeds the GM by 5, and the GM exceeds the H.M. by 4. Then the numbers are-

(A) 10, 40 (B) 10, 20

(C) 20, 40 (D) 10, 50

18. $\sum_{k=1}^{n} k^3$ is equal to-

(A) $2\sum_{k=1}^{n} k^2$ (B) $\left(\sum_{k=1}^{n} k\right)^2$

(C) $\left(\sum_{k=1}^{n} k\right)^3$ (D) $3\sum_{k=1}^{n} k^2$

19. The sum of the first n terms of the series $1^2 + 2.\ 2^2 + 3^2 + 2.4^2 + 5^2 + 2.6^2 + ...$ is $\frac{n(n+1)^2}{2}$ when n is even. When n is odd the sum is -

(A) $\frac{3n(n+1)}{2}$ (B) $\frac{n^2(n+1)}{2}$

(C) $\frac{n(n+1)^2}{4}$ (D) $\left[\frac{n(n+1)}{2}\right]^2$

20. The sum of first 20 terms of the sequence 0.7, 0.77, 0.777, ..., is -

(A) $\frac{7}{81}(179 + 10^{-20})$ (B) $\frac{7}{9}(99 + 10^{-20})$

(C) $\frac{7}{81}(179 - 10^{-20})$ (D) $\frac{7}{9}(99 - 10^{-20})$

21. The number of terms in the sequence 1, 3, 6, 10, 15, 21,...., 5050 is-

(A) 50 (B) 100 (C) 101 (D) 105

22. The sum of the infinite series $1^2 + 2^2 x + 3^2 x^2 + ...$ is-

(A) $(1+x)/(1-x)^3$ (B) $(1+x)/(1-x)$

(C) $x/(1-x)^3$ (D) $1/(1-x)^3$

23. If a, b, c are in G.P. and A.M. between a, b and b, c are respectively p and q, then (a/p) + (c/q) is equal to-

(A) 0 (B) 1 (C) 2 (D) 1/2

24. Let $a_n = n^{th}$ term of an A.P.

If $\sum_{r=1}^{100} a_{2r} = \alpha$, $\sum_{r=1}^{100} a_{2r-1} = \beta$ then common difference is equal to-

(A) $\alpha - \beta$ (B) $\beta - \alpha$

(C) $\frac{\alpha-\beta}{100}$ (D) None of these

25. If S_r denotes sum of first r terms of A.P. and $\frac{S_a}{a^2} = \frac{S_b}{b^2} = c$ then $S_c =$

(A) c^3 (B) $\frac{c}{ab}$

(C) abc (D) $a + b + c$

26. The geometric mean of three numbers was computed as 6. It was subsequently found that, in this computation, a number 8 was wrongly read as 12. What is the correct geometric mean ?

(A) 4 (B) $\sqrt[3]{5}$

(C) $2\sqrt[3]{18}$ (D) None of these

27. If the AM and GM between two number are in the ratio m : n, then what is the ratio between the two numbers ?

(A) $\frac{m+\sqrt{m^2-n^2}}{m-\sqrt{m^2-n^2}}$ (B) $\frac{m+n}{m-n}$

(C) $\frac{m^2-n^2}{m^2+n^2}$ (D) $\frac{m^2+n^2-mn}{m^2+n^2+mn}$

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28. In a GP of positive terms, any term is equal to one-third of the sum of next two terms. What is the common ratio of the GP ?

(A) $\frac{\sqrt{13}+1}{2}$ (B) $\frac{\sqrt{13}-1}{2}$

(C) $\frac{\sqrt{13}+1}{3}$ (D) $\sqrt{13}$

29. The sum of the first n terms of the series $\frac{1}{2}+\frac{3}{4}+\frac{7}{8}+\frac{15}{16}+....$ is equal to

(A) $2^n - n - 1$ (B) $1 - 2^{-n}$

(C) $2^{-n} + n - 1$ (D) $2^n - 1$

30. If $S_n = nP + \frac{n(n-1)Q}{2}$, where S_n denotes the sum of the first n terms of an AP, then the common difference is

(A) P + Q (B) 2P + 3Q

(C) 2Q (D) Q

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