1. If the p^{th}, q^{th} and r^{th} term of a G.P. are *a*, *b*, *c* respectively, then $a^{q-r} \cdot b^{r-p} \cdot c^{p-q}$ is equal to
(a) 0 (b) 1 (c) *abc* (d) *pqr*

2. Let a_n be the n^{th} term of the G.P. of positive numbers. Let $\sum_{n=1}^{100} a_{2n} = \alpha$ and $\sum_{n=1}^{100} a_{2n-1} = \beta$, such that $\alpha \neq \beta$, then the common ratio is
(a) $\frac{\alpha}{\beta}$ (b) $\frac{\beta}{\alpha}$ (c) $\sqrt{\frac{\alpha}{\beta}}$ (d) $\sqrt{\frac{\beta}{\alpha}}$

3. The sum of first two terms of a G.P. is 1 and every term of this series is twice of its previous term, then the first term will be

(a) $\frac{1}{4}$ (b) $\frac{1}{3}$ (c) $\frac{2}{3}$ (d) $\frac{3}{4}$

4. The first term of an infinite geometric progression is *x*and its sum is 5. Then
(a) $0 \leq x \leq 10$ (b) $0 < x < 10$
(c) $-10 < x < 0$ (d) $x > 10$

5. The value of $.2\dot{3}\dot{4}$ .234 is
(a) $\frac{232}{990}$ (b) $\frac{232}{9990}$ (c) $\frac{0.232}{990}$ (d) $\frac{232}{9909}$

6. If *a*, *b*, *c* are in A.P. and |*a*|, |*b*|, |*c*| < 1, and $x = 1 + a + a^2 + ... \infty$, $y = 1 + b + b^2 + ... \infty$, $z = 1 + c + c^2 + ... \infty$
Then *x*, *y*, *z* shall be in
(a) A.P. (b) G.P. (c) H.P. (d) None of these

7. The G.M. of the numbers $3, 3^2, 3^3 ...... 3^n$ is
(a) $3^{\frac{2}{n}}$ (b) $3^{\frac{n+1}{2}}$ (c) $3^{\frac{n}{2}}$ (d) $3^{\frac{n-1}{2}}$

8. If *a*, *b*, *c*are in A.P. *b* - *a*, *c* - *b* and *a* are in G.P., then *a* : *b* : *c* is
(a) 1 : 2 : 3 (b) 1 : 3 : 5 (c) 2 : 3 : 4 (d) 1 : 2 : 4

9. Let two numbers have arithmetic mean 9 and geometric mean 4. Then these numbers are the roots of the quadratic equation
(a) $x^2 - 18x - 16 = 0$ (b) $x^2 - 18x + 16 = 0$
(c) $x^2 + 18x - 16 = 0$ (d) $x^2 + 18x + 16 = 0$

10. If x, 2x + 2, 3x + 3, are first 3 terms of a G.P. then its 4^{th} term is -
(a) 27 (b) -27 (c) -27/2 (d) 27/2

11. Every term of G.P. is positive and also every term is sum of two preceding terms. Then the common ratio of G.P. is
(a) $\frac{1-\sqrt{5}}{2}$ (b) $\frac{\sqrt{5}+1}{2}$ (c) $\frac{\sqrt{5}-1}{2}$ (d) None of these

12. 0.2 + 0.22 + 0.222 + ….. to n terms is equal to
(a) $\frac{2}{9}\left[n - \frac{1}{9}(1-10^{n})\right]$ (b) n - $\frac{1}{9}$ (1 - 10^{-n})
(c) $\frac{2}{9}\left[n - \frac{1}{9}(1-10^{-n})\right]$ (d) $\frac{2}{9}$

13. If log 2, $\log(2^n - 1)$ and $\log(2^n + 3)$ are in A.P., then *n* =
(a) 5/2 (b) $\log_2 5$ (c) $\log_3 5$ (d) $\frac{3}{2}$

14. The numbers $(\sqrt{2}+1), 1, (\sqrt{2}-1)$ will be in

(a) A.P. (b) G.P.

(c) H.P. (d) None of these

15. If the third term of a G.P. is 4 then the product of its first 5 terms is
(a) 4^3 (b) 4^4 (c) 4^5 (d) None of these

16. The third term of a G.P. is 4, the product of the first five terms is
(a) 4^3 (b) 4^5 (c) 4^4 (d) None of these

17. If a, b , c, d and p are distinct real numbers such that $(a^2+b^2+c^2)p^2 - 2(ab + bc + cd)p + (b^2 + c^2 + d^2) \leq 0$, then a, b, c, d are in
(a) A.P. (b) G.P. (c) H. P. (d) None of these

18. The first and last term of an A.P. are a and l respectively. If s be the sum of all terms of the A.P., then the common difference is -
(a) $\frac{l^2 - a^2}{2s - (l + a)}$ (b) $\frac{l^2 - a^2}{2s - (l - a)}$
(c) $\frac{l^2 + a^2}{2s + (l + a)}$ (d) $\frac{l^2 + a^2}{2s - (l + a)}$

19. If $A = 1 + r^a + r^{2a} + r^{3a} + \ldots\infty$ and $B = 1 + r^b + r^{2b} + r^{3b} + \ldots\infty$, then $\frac{a}{b}$ is equal to -
(a) $\log_B A$ (b) $\log_{1-B} (1 - A)$
(c) $\log_{\frac{B-1}{B}} \left(\frac{A-1}{A}\right)$ (d) None of these

20. Suppose a, b, c are in A.P. and a^2, b^2, c^2 are in G.P. If a < b < c and a + b + c =3/2, then the value of a is -
(a) $\frac{1}{2\sqrt{2}}$ (b) $\frac{1}{2\sqrt{3}}$ (c) $\frac{1}{2} - \frac{1}{\sqrt{3}}$ (d) $\frac{1}{2} - \frac{1}{\sqrt{2}}$

21. If a, b, c are digits then the rational number represented by 0. cababab…..is -
(a) $\frac{99c + ab}{990}$ (b) $\frac{99c + 10a + b}{99}$
(c) $\frac{99c + 10a + b}{990}$ (d) None of these

22. If $\frac{a + be^y}{a - be^y} = \frac{b + ce^y}{b - ce^y} = \frac{c + de^y}{c - de^y}$, then a, b, c, d are in -
(a) A.P. (b) G.P. (c) H.P. (d) None of these

23. $2^{1/4} . 4^{1/8} . 8^{1/16} \ldots\infty$ is equal to -
(a) 1 (b) 2 (c) 3/2 (d) None of these

24. If $(1 + x)(1 + x^2)(1 + x^4)\ldots\ldots(1 + x^{128}) = \sum_{r=0}^{n} x^r$ then n is -
(a) 225 (b) 255 (c) 60 (d) 127

25. $\lambda 2\alpha$, β are the roots of the equation $x^2 - 3x + a = 0$ and γ, δ are the roots of the equation $x^2 - 12x + b = 0$. If $\alpha, \beta, \gamma, \delta$ form an increasing, GP, then (a, b) is equal to-
(a) (3, 12) (b) (12, 3) (c) (2, 32) (d) (4, 16)

26. If one geometric mean G and two arithmetic means p and q be inserted between two number, then G^2 is equal to -
(a) (3p - q) (3q - p) (b) (2p - q) (2q - p)
(c) (4p - q) (4q - p) (d) None of these

27. If $f(x)$ is a function satisfying $f(x + y) = f(x) f(y)$ for all x, y $\in$ N such that $f(1) = 3$ and $\sum_{x=1}^{n} f(x) = 120$. Then the value of n is -
(a) 4 (b) 5 (c) 6 (d) None of these

28. If the sides of a right angled triangle are in G.P., then the cosine of the greater acute angle is -

(a) $\frac{2}{1+\sqrt{5}}$ (b) $\frac{1}{1-\sqrt{5}}$

(c) $\frac{1+\sqrt{5}}{2}$ (d) None of these

29. The sum of an infinite geometric series is 2 and the sum of the geometric series made from the cubes of this infinite series is 24. Then the series is -

(a) $3 + \frac{3}{2} - \frac{3}{4} + \frac{3}{8}$ …. (b) $3 + \frac{3}{2} + \frac{3}{4} + \frac{3}{8} + \ldots$

(c) $3 - \frac{3}{2} + \frac{3}{4} - \frac{3}{8} + \ldots$ (d) None of these

30. Sum to infinity of the series $1 + \frac{4}{5}+\frac{7}{5^2}+\frac{10}{5^3} + \ldots\ldots$ is

(a) $\frac{16}{25}$ (b) $\frac{11}{8}$ (c) $\frac{35}{16}$ (d) $\frac{8}{11}$

Answers

1)b 2)a 3)b 4)b 5)a 6)c7)b 8)a9)b10)c 11)b 12)c 13)b 14)b 15)c 16)b 17)b 18)a 19)c 20)d 21)c22)b 23)b 24)b 25)c 26)b 27)a 28)a 29)c 30)c