

## Chapter 6: SEQUENCES AND SERIES

1) The general term of the sequence  $2/1, 3/2, 4/3, \dots$  is an =

- A)  $\frac{n+1}{n}$   
 B)  $\frac{n}{n+1}$   
 C)  $\frac{n}{n-1}$   
 D)  $\frac{n-1}{n}$

Answer: A

2) If  $a, a+d, a+2d, \dots$  is A.P, then  $a_n =$

- A)  $a + nd$   
 B)  $a - nd$   
 C)  $a + (n-1)d$   
 D)  $a + (n+1)d$

Answer: C

3)  $\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$  is arithmetic mean between  $a$  and  $b$  if  $n =$

- A)  $-1$   
 B)  $1$   
 C)  $0$   
 D)  $2$

Answer: C

4) If  $A, G, H$  are A.M, G.M, and H.M between two numbers, then

- A)  $A < G < H$   
 B)  $A < G > H$   
 C)  $A > G > H$   
 D)  $A > G < H$

Answer: C

5) The harmonic mean between two numbers  $a$  and  $b$  is

- A)  $\pm \sqrt{ab}$   
 B)  $\frac{a+b}{2}$   
 C)  $\frac{2ab}{a+b}$   
 D)  $\frac{2ab}{a-b}$

Answer: C

6) The arithmetic mean between 4 and 6 is

- A)  $\sqrt{24}$

- B)  $-\sqrt{24}$   
 C)  $24/5$   
 D)  $5$

Answer: D

7) If  $a$  is the first term and  $r < 1$  is common ratio of G.P, then  $S_n =$

- A)  $\frac{a(1-r^n)}{1-r}$   
 B)  $\frac{a(1+r^n)}{1+r}$   
 C)  $ar^n$   
 D)  $\frac{a(1-r^n)}{1+r}$

Answer: A

8) An infinite geometric series is convergent if

- A)  $|r| < 1$   
 B)  $r > 1$   
 C)  $r = 1$   
 D) Both B and C are correct

Answer: A

9) If  $a$  is the first term and  $r$  is the common ratio of G.P then  $a_n =$

- A)  $ar^{n-1}$   
 B)  $ar^{n+1}$   
 C)  $\frac{a(1-r^n)}{1-r}$   
 D)  $\frac{a(1+r^n)}{1+r}$

Answer: A

10)  $\frac{a^{n+1} + b^{n+1}}{a^n + b^n}$  is H.M between  $a$  and  $b$  if

- A)  $n = 0$   
 B)  $n = 1$   
 C)  $n = -1$   
 D)  $n = 2$

Answer: C

11) If  $a$  is the first term and  $r$  is common ratio such that  $r < 1$ , then  $S_\infty =$

- A)  $\frac{a}{1-r}$   
 B)  $\frac{a}{1+r}$

C)  $\frac{a(1-r^n)}{1-r}$

D)  $\frac{a(1+r^n)}{1+r}$

Answer: A

12) The harmonic mean between 9 and 11 is

A) 10

B)  $\pm\sqrt{99}$

C)  $-\sqrt{99}$

D) 99/10

Answer: D

13) If A, G, H are arithmetic mean, geometric and harmonic mean between a and b, then

A)  $G^2 = AH$

B)  $A^2 = GH$

C)  $H^2 = AG$

D) None of these

Answer: A

14) -1, 1, -1, 1, .... is

A) Arithmetic Sequence

B) Geometric Sequence

C) Alternating Sequence

D) Harmonic Sequence

Answer: C

15) The geometric mean between 8/9, 9/8 is

A) +1

B) -1

C)  $\pm 1$

D)  $\frac{8}{17}$

Answer: C

16) A sequence is a function whose domain is

A) the set of rational numbers

B) The set of irrational numbers

C) The set of integers

D) The set of natural numbers

Answer: D

17) The geometric mean between a and b is

A)  $\frac{a+b}{2}$

B)  $\pm\sqrt{ab}$

C)  $\frac{2ab}{a+b}$

D)  $\frac{a+b}{2ab}$

Answer: B

18) The arithmetic mean between a and b is

A)  $\frac{2ab}{a+b}$

B)  $\frac{a+b}{2ab}$

C)  $\frac{a+b}{2}$

D)  $\pm\sqrt{ab}$

Answer: C

19) Which of the following series is convergent.

A)  $2 - 6 + 18 - \dots$

B)  $8 + 4 + 2 + \dots$

C)  $5 + 10 + 20 + \dots$

D)  $3/2 + 3 + 6 + \dots$

Answer: B

20) If  $a = 3$ ,  $r = 2/3$ , then sum of infinite  $S_\infty =$

A) 9

B)  $\frac{9}{2}$

C)  $\frac{2}{9}$

D)  $\frac{3}{2}$

Answer: A

21) If  $2 + 1 + \frac{1}{2} + \dots$  is infinite geometric series then  $S_\infty =$

A) 2

B) 4

C)  $\frac{1}{2}$

D)  $\frac{1}{4}$

Answer: B

22) The population of a town increases geometrically at the rate of 4% per year. If the present population is 100,000, then population after 4 years will be

A)  $100,000 (1 + .04)^3$

B)  $100,000 (1 + .04)^4$

C)  $100,000 (1 - 0.04)^3$

D)  $100,000 (1 - 0.04)^4$

Answer: B

23) The sum of n terms of arithmetic series  $S_n =$

A)  $n/2[2a + (n-1)d]$

- B)  $ar^{n-1}$
- C)  $\frac{a(1-r^n)}{1-r}$
- D)  $a + (n-1)d$

Answer: A

24) The two arithmetic means between 5 and 35 are

- A) 15, 25
- B) 10, 20
- C) 10, 15
- D) 10, 25

Answer: A

25) If  $2b - 1, 4b + 1, 15b - 3$  is a geometric sequence, then  $b =$

- A) 4
- B) 3
- C) 2
- D) 1

Answer: C

26) Which of the following is a geometric series?

- A) 5, 7, 9, 11, .....
- B) 3, 5, 7, 9, .....
- C) 1,  $\frac{1}{3}$ , 3, 9, .....
- D) 9, 3, 1,  $\frac{1}{3}$ , .....

Answer: D

27) The general term of the sequence 3, 6, 9, 12 ..... is

- A)  $n$
- B)  $2n$
- C)  $3n$
- D)  $n^2$

Answer: C

28) Which of the following is harmonic sequence?

- A) 3, 5, 7, .....
- B)  $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots$
- C)  $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \dots$
- D) 3, 9, 27, .....

Answer: C