# 41 Lecture - MTH101

## **Important Mcqs**

Which of the following is a recursive formula for the Fibonacci sequence?

a) 
$$f_n = n^2$$

b) 
$$f_1 = 1$$
,  $f_2 = 1$ ,  $f_n = f_{n-1} + f_{n-2}$ 

c) 
$$f_n = n!$$

d) f 
$$n = 2^n$$

Answer: b) 
$$f_1 = 1$$
,  $f_2 = 1$ ,  $f_n = f_{n-1} + f_{n-2}$ 

What is the nth term of the arithmetic sequence 2, 5, 8, 11, ...?

a) 
$$2n + 1$$

b) 
$$3n + 1$$

d) 
$$2n + 2$$

Answer: d) 2n + 2

Which of the following tests is used to determine whether an infinite series converges or diverges?

- a) Comparison test
- b) Limit comparison test
- c) Integral test
- d) All of the above

Answer: d) All of the above

What is the sum of the geometric series  $1/2 + 1/4 + 1/8 + ... + (1/2)^n + ...$ ?

- a) 1
- b) 2

- c) 3/2
- d) 4/3

Answer: c) 3/2

### Which of the following is a bounded sequence?

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

Answer: d)  $\{n/(n+1)\}$ 

#### Which of the following is an example of an arithmetic sequence?

- a) 1, 3, 9, 27, ...
- b) 1, 2, 4, 8, ...
- c) 2, 4, 8, 16, ...
- d) 1, 1/2, 1/4, 1/8, ...

Answer: b) 1, 2, 4, 8, ...

#### What is the nth term of the geometric sequence 1, 2, 4, 8, ...?

- a) 2<sup>n</sup>
- b) 2n
- c) n^2
- d) n!

Answer: a) 2<sup>n</sup>

#### Which of the following is an example of a divergent series?

a) 
$$1/2 + 1/4 + 1/8 + ... + (1/2)^n + ...$$

b) 
$$1 + 1/2 + 1/3 + ... + 1/n + ...$$

c) 
$$1 - 1/2 + 1/3 - ... + (-1)^n/n + ...$$

d) 
$$e^x = 1 + x + x^2/2! + x^3/3! + ...$$

Answer: c) 1 - 
$$1/2 + 1/3 - ... + (-1)^n/n + ...$$

What is the limit of the sequence  $\{1/n\}$  as n approaches infinity?

- a) 0
- b) 1
- c) -1
- d) Does not exist

Answer: a) 0

Which of the following is a formula for the nth term of a geometric sequence?

a) 
$$a_n = a_1 + (n-1)d$$

b) 
$$a_n = a_1 r^{n} (n-1)$$

c) 
$$a_n = n^2$$

d) 
$$a_n = a_1 + r^n$$

Answer: b)  $a_n = a$