

## Week 2 Assignment

1. Let  $A = \{x \in \mathbb{Q} : x < 7\}$ . Then supremum of A is

- (A) 7
- (B) 3
- (C) Does not exist
- (D) 0

2. If  $A = \left\{ \frac{1}{m} + \frac{1}{n} : m, n \in \mathbb{Q} \right\}$  then supremum of A is

- (A) 1
- (B) 0
- (C) 2
- (D) None of above

3. If  $A = \left\{ \frac{n + (-1)^n}{n} : n \in \mathbb{Q} \right\}$  then infimum of A is

- (A) 2
- (B) 0
- (C) 1
- (D) None of above

4. Which is the set of all limit points of natural numbers  $\mathbb{N}$  in  $\mathbb{R}$  ?

(A)  $\mathbb{N}$

(B)  $\emptyset$

(C)  $\mathbb{N} \cup \{0\}$

(D) None of the above.

5. If  $A$  is an open set and  $B$  is a closed set such that  $B \subset A$ , then  $A \setminus B$  is

(A) an open set

(B) a closed set

(C) subset of an open set

(D) subset of a closed set.

6.  $S = \left\{1 + \frac{1}{n} : n \in \mathbb{N}\right\} \cup \left\{-1 - \frac{1}{n} : n \in \mathbb{N}\right\}$ . Then which of the following is true?

(A)  $S$  is an open set

(B)  $S$  is a closed set

(C)  $\{1, -1\}$  is the set of limit points of  $S$ .

(D) None of the above.

7.  $S = \{-2, 2\} \cup \left\{\frac{1}{n} : n \in \mathbb{N}\right\} \cup \left\{-\frac{1}{n} : n \in \mathbb{N}\right\}$ . Then which of the following is true?

(A)  $S$  is a closed set

- (B) S is not a closed set
- (C)  $\{-2, 2\}$  is the set of limit points of S.
- (D) none of the above

8. The derived set of the set of all rational numbers contained in  $[1, 2]$  is

- (A) all rational numbers in  $[1, 2]$
- (B) all irrational numbers in  $[1, 2]$
- (C)  $[1, 2]$
- (D)  $\phi$ .

9. The set  $(0, 1) \cup \left\{ \frac{1}{2^n} : n = 1, 2, 3, \dots \right\}$  is

- (A) an open set
- (B) a closed set
- (C) neither an open set nor a closed set
- (D) None of the above.

10. The set  $\left\{ \frac{1 + (-1)^n}{n} : n \in \mathbb{N} \right\}$  is

- (A) an open set
- (B) a closed set
- (C) neither an open set nor a closed set
- (D) None of the above.