

Seat No.	
----------	--

B.Sc. (Semester - III) (CBCS) Examination Oct/Nov-2019
Mathematics (Paper - VI)
REAL ANALYSIS

Day & Date: Tuesday, 15-10-2019
 Time: 03:00 PM To 05:30 PM

Max. Marks: 70

Instructions: 1) All questions are compulsory.
 2) Figures to the right indicate full marks.

Q.1 Fill in the blanks by choosing correct alternatives given below. 14

- 1) If p is prime then \sqrt{p} is _____ number.
 - a) Rational
 - b) Irrational
 - c) Complex
 - d) None
- 2) If $(a, b) \in R$ and $(b, a) \in R \Leftrightarrow a = b, \forall a, b \in R$ then R is _____ relation.
 - a) Reflexive
 - b) Symmetric
 - c) Anti symmetric
 - d) None
- 3) If $x_1 \neq x_2 \Rightarrow f(x_1) \neq f(x_2), \forall x_1, x_2 \in A$ then $f: A \rightarrow B$ is _____.
 - a) One - one
 - b) Onto
 - c) One - many
 - d) None
- 4) Which is complete ordered field?
 - a) N
 - b) I
 - c) Q
 - d) R
- 5) $\lim_{n \rightarrow \infty} \sqrt[n]{n} =$ _____.
 - a) 1
 - b) 0
 - c) ∞
 - d) None
- 6) The sequence $\{(-1)^{n-1}\}$ is _____.
 - a) Only bounded below
 - b) Bounded
 - c) Bounded above
 - d) None
- 7) $\lim_{n \rightarrow \infty} \left[\frac{1+n}{n} \right]^n$ lies between _____.
 - a) 0 and 1
 - b) 1 and 2
 - c) 2 and 3
 - d) None
- 8) The sequence $\{x^n\}$ is convergent if and only if _____.
 - a) $-1 < x < 1$
 - b) $x < -1$
 - c) $x > 1$
 - d) None
- 9) The glb of the sequence $\{1 + 1/n\}$ is _____.
 - a) 0
 - b) 1
 - c) 2
 - d) None
- 10) The series $\sum \frac{1}{n^p}$ is convergent if _____.
 - a) $p < 1$
 - b) $p = 1$
 - c) $p > 1$
 - d) None
- 11) The series $\sum \sin(1/n)$ is _____.
 - a) Diverges
 - b) Absolutely cgt
 - c) Conditionally cgt
 - d) None

Q.5 Answer the following questions. (Any Two)

- a) Show that the set of rational number is not order complete.
- b) State and prove nested Interval theorem.
- c) State Raabe's test.

Solve $\frac{3}{7} + \frac{3.6}{7.10} + \frac{3.6.9}{7.10.13} + \dots$