Vivekanand College Kolhapur (Empowered Autonomous)
Department of Mathematics
B.Sc. III (Sem V)
Real Analysis
Surprise Test 2024-25

Time & date: 7/10/2024 **Total Marks: 30**

Sr. No.	Roll No.	Name of student	Sign.	Marks
1	8249	ARDALKAR ADITYA ASHOK	AArdlkr	18
2	8250	BHOGAM SUJATA KRISHNAT	Bhogam	16
3	8251	BHOSALE AASHA SADIK	Bhosale	20
4	8252	CHOUGULE PRATEEK ANIL	Ab	00
5	8253	CHOUGULE VISHAKHA MAHADEV	VM chougule	12
6	8254	GANBAVALE TEJAS SANTOSH	Ab	0
7	8255	JADHAV SHRIDHAR SUHAS	Jadhav	14
8	8256	KALAKE ABHIJEET LAXMAN	Abhijeet	14
9	8257	KALAMKAR SANIKA JAYVANT	Ab	0
10	8258	KAMBLE AVISHKAR SUDESH	Akamble	16
11	8259	MORE PRANALI ASHOK	moreprnali	18
12	8260	PATIL ARPITA JINESHWAR		20
13	8261	SAJNIKAR DIVYA NETAJI	Sajnikar	22
14	8262	VADICHARLA SANDHYA KRUSHNAMURTI	SVkrushna	12

HEAD
DEPARTMENT OF MATHEMATICS
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

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Vivekanand College Kolhapur (Empowered Autonomous)
Department of Mathematics
B.Sc. III (Sem V)
Real Analysis
Surprise Test 2024-25

Time & date: 7/10/2024 **Total Marks: 30**

Name of the student: Divya N. Sajnikar
Roll no.: 8261

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1. If a sequence is bounded above and below, then it is called
   a) Divergent
   b) Bounded
   c) Cauchy
   d) Monotonic

2. The least upper bound of a set is also called its
   a) Limit inferior
   b) Greatest lower bound
   c) Supremum
   d) Limit superior

3. The greatest lower bound of a set is called its
   a) Supremum
   b) Infimum
   c) Limit inferior
   d) Convergent limit

4. If a sequence has a limit, then it is necessarily
   a) Divergent
   b) Monotone
   c) Convergent
   d) Cauchy only

5. A sequence is called Cauchy if
   a) It is bounded
   b) The difference between its successive terms tends to zero
   c) For every $\varepsilon > 0, \exists\ N \in \mathbb{N}$ such that $|xm - xn| < \varepsilon$ for m, n > N
   d) It is monotonic

6. Which of the following sequences is bounded but not convergent?
   a) $(-1)^n$
   b) 1/n
   c) n
   d) 0

7. Limit superior of a sequence is defined as
   a) $lim\ sup(xn) = \lim_{n\to\infty}(sup\{xk: k \geq n\})$
   b) $lim\ sup(xn) = \lim_{n\to\infty}\{xk\}$
   c) $lim\ sup(xn) = \lim_{n\to\infty}(inf\{xk: k \geq n\})$

d) None of these

8. A monotonic increasing sequence which is bounded above is always
   a) Divergent
   b) Decreasing
   c) Convergent
   d) Oscillatory

9. A series $\sum a_n$ is convergent if
   a) $a_n \to \infty$
   b) $a_n \to 0$
   c) a_n is bounded
   d) a_n is increasing

10. The series $\sum (-1)^n / n$ is
    a) Absolutely convergent
    b) Conditionally convergent
    c) Divergent
    d) Oscillatory

11. A series $\sum a_n$ is called absolutely convergent if
    a) $\sum |a_n|$ diverges
    b) $\sum |a_n|$ converges
    c) $a_n \to 0$
    d) $a_n \geq 0$

12. The series $\sum 1/n^2$ is
    a) Divergent
    b) Conditionally convergent
    c) Absolutely convergent
    d) Not defined

13. The harmonic series $\sum 1/n$ is
    a) Convergent
    b) Divergent
    c) Absolutely convergent
    d) Conditionally convergent

14. The alternating series test (Leibniz test) requires
    a) an decreasing and $\lim a_n = 0$
    b) an bounded and $\lim a_n \neq 0$
    c) an increasing and $\lim a_n = 0$
    d) an unbounded

15. If a series converges absolutely, then it is also
    a) Divergent
    b) Conditionally convergent
    c) Convergent
    d) Monotonic

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Time & date: 07/10/2024 **Total Marks: 30**

Name of the student: Abhijeet L. Kalake
Roll no.: 8256

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1. If a sequence is bounded above and below, then it is called
   a) Divergent
   b) Bounded
   c) Cauchy
   d) Monotonic

2. The least upper bound of a set is also called its
   a) Limit inferior
   b) Greatest lower bound
   c) Supremum
   d) Limit superior

3. The greatest lower bound of a set is called its
   a) Supremum
   b) Infimum
   c) Limit inferior
   d) Convergent limit

4. If a sequence has a limit, then it is necessarily
   a) Divergent
   b) Monotone
   c) Convergent
   d) Cauchy only

5. A sequence is called Cauchy if
   a) It is bounded
   b) The difference between its successive terms tends to zero
   c) For every $\varepsilon > 0, \exists\, N \in \mathbb{N}$ such that $|xm - xn| < \varepsilon$ for $m, n > N$
   d) It is monotonic

6. Which of the following sequences is bounded but not convergent?
   a) $(-1)^n$
   b) $1/n$
   c) n
   d) 0

7. Limit superior of a sequence is defined as
   a) $lim\ sup(xn) = \lim_{n\to\infty}(sup\{xk : k \geq n\})$
   b) $lim\ sup(xn) = \lim_{n\to\infty}\{xk\}$
   c) $lim\ sup(xn) = \lim_{n\to\infty}(inf\{xk : k \geq n\})$

d) None of these

8. A monotonic increasing sequence which is bounded above is always
   a) Divergent
   b) Decreasing
   c) Convergent
   d) Oscillatory

9. A series $\sum$ an is convergent if
   a) an $\to \infty$
   b) an $\to 0$
   c) an is bounded
   d) an is increasing

10. The series $\sum (-1)^n / n$ is
    a) Absolutely convergent
    b) Conditionally convergent
    c) Divergent
    d) Oscillatory

11. A series $\sum$ an is called absolutely convergent if
    a) $\sum |an|$ diverges
    b) $\sum |an|$ converges
    c) an $\to 0$
    d) an ≥ 0

12. The series $\sum 1/n^2$ is
    a) Divergent
    b) Conditionally convergent
    c) Absolutely convergent
    d) Not defined

13. The harmonic series $\sum 1/n$ is
    a) Convergent
    b) Divergent
    c) Absolutely convergent
    d) Conditionally convergent

14. The alternating series test (Leibniz test) requires
    a) an decreasing and lim an = 0
    b) an bounded and lim an $\neq 0$
    c) an increasing and lim an = 0
    d) an unbounded

15. If a series converges absolutely, then it is also
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    c) Convergent
    d) Monotonic

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Time & date: 7/10/2024 **Total Marks: 30**

Name of the student: Vishakha m. chougule
Roll no.: 8253

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1. If a sequence is bounded above and below, then it is called
   a) Divergent
   b) Bounded
   c) Cauchy
   d) Monotonic

2. The least upper bound of a set is also called its
   a) Limit inferior
   b) Greatest lower bound
   c) Supremum
   d) Limit superior

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   a) Supremum
   b) Infimum
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    a) $\sum |an|$ diverges
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    c) an $\to 0$
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12. The series $\sum 1/n^2$ is
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    c) Convergent
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Time & date: 7/10/2024 **Total Marks: 30**

Name of the student: Aditya Ashok Ardalkar
Roll no.: 8249

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1. If a sequence is bounded above and below, then it is called
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   d) Monotonic

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   d) Limit superior

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   b) Infimum
   c) Limit inferior
   d) Convergent limit

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   c) an $\to 0$
   d) an ≥ 0

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   c) Convergent
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