

Seat No.	
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M.Phil./Ph.D. Entrance Examination, September - 2019
MATHEMATICS

Day and Date : Thursday, 19 - 09 - 2019
Time : 1.00 p.m. to 3.00 p.m.

Total Marks : 100

- Instructions :**
- 1) All questions are compulsory.
 - 2) Each question carries 2 marks.
 - 3) Answers should be marked in the given OMR answer sheet by darkening the appropriate option.
 - 4) Use black ball point pen only for marking the circle. Do not make any stray mark on the OMR Answer Sheet.
 - 5) Follow the instructions given on OMR Sheet.
 - 6) Rough work shall be done on the sheet provided at the end of question paper.
 - 7) Only non programmable calculators are allowed.

- 1) Research ethics include
 - A) Integrity
 - B) Subjectivity
 - C) Punctuality
 - D) Smartness

- 2) Which of the following is an example of scientific knowledge?
 - A) the authority of the prophet or great man
 - B) social traditions and customs
 - C) laboratory and field experiments
 - D) religious scriptures or notes

- 3) The readymade and readily available data is called
 - A) Primary
 - B) Secondary
 - C) Personal
 - D) Organizational

- 4) Concepts represent various degrees of
 - A) Formulation
 - B) Calculation
 - C) Abstraction
 - D) Specifications

- 10) Second step in problem formulation is
- A) Statement of the problem
 - B) Understanding the nature of the problem
 - C) Survey
 - D) Discussions
- 11) If the minute hand of a clock has moved 300° , how many degrees has the hour hand moved?
- A) 25°
 - B) 150°
 - C) 50°
 - D) 300°
- 12) The average of 3 consecutive even numbers is 18, find the largest of these numbers.
- A) 15
 - B) 16
 - C) 20
 - D) 26
- 13) Which of the following is an example of professional writing?
- A) From equations (2) and (3), we get the desired result.
 - B) From Equations (2) and (3), we get the desired result.
 - C) From equations (2), (3), we get the desired result.
 - D) From Equations (2) and (3), we get, the desired result.
- 14) Which of the following is an example of professional writing?
- A) State and prove Open Mapping theorem.
 - B) State and prove Open mapping theorem.
 - C) State and prove open mapping theorem.
 - D) State and Prove Open Mapping Theorem.

- 15) Similarity checks for plagiarism shall exclude
- A) All references, bibliography, table of content, preface and acknowledgements
 - B) All quoted work either falling under public domain or reproduced with all necessary permission and/or attribution
 - C) All generic terms, laws, standard symbols and standard equations
 - D) All of the above
- 16) Which of the following is an example of professional writing?
- A) Consequently $R_{ij} = 0$ characterizes the empty space.
 - B) Consequently, $R_{ij} = 0$ characterizes the empty space.
 - C) Consequently, $R_{ij} = 0$, characterizes the empty space.
 - D) Consequently, $R_{ij} = 0$ Characterizes the empty space.
- 17) Which of the following is an example of professional writing?
- A) This completes the proof of my Inequalities (5.2) and (5.4).
 - B) This completes the proof of our Inequalities (5.2) and (5.4).
 - C) This completes the proof of our inequalities (5.2) and (5.4).
 - D) This completes the proof of my inequalities (5.2) and (5.4).
- 18) Which of the following is an example of professional writing?
- A) Section 3 establishes the converse of theorem 2.
 - B) We establish the converse of Theorem 2 in Section 3.
 - C) We establish the converse of Theorem 2 in section 3.
 - D) Section 3 establishes the converse of Theorem 2.

- 35) Let $f(z) = \frac{1}{\sin\left(\frac{\pi}{z}\right)}$, $z \in \mathbb{C}$. Then $z = 0$ is
- A) pole of f
 - B) isolated singularity of f
 - C) non-isolated singularity of f
 - D) essential singularity of f
- 36) The usual topological space (\mathbb{R}, τ_u) is not
- A) compact
 - B) connected
 - C) first axiom space
 - D) second axiom space
- 37) A topological space (X, τ) is T_1 space if and only if every finite subset of X is always
- A) open
 - B) closed
 - C) open but not closed
 - D) both open and closed
- 38) The complete graph K_3 has _____ different spanning trees.
- A) 3
 - B) 9
 - C) 6
 - D) 2
- 39) The total number of edges in complete bipartite graph K_4 are _____
- A) 12
 - B) 9
 - C) 6
 - D) 7

Rough Work