TEERTHANKER MAHAVEER UNIVERSITY

(Established under Govt. of U. P. Act No. 30, 2008)
Delhi Road, Moradabad (U.P.)

SAMPLE QUESTION PAPER FOR RESEARCH APTITUDE TEST IN MATHEMATICS

Max. Marks: 100 **Time: 2.00 Hrs**

Note:

1. The question paper is divided into two parts viz. Part-A and Part-B, carrying 50 marks each.
2. **Part-A** consists of 50 multiple choice questions carrying one mark each. All questions are compulsory. There shall be no negative marking. The answers are to be marked on the OMR sheet with black pencil.
3. **Part-B** consists of 8 descriptive type questions, out of which any 5 questions are to be answered. Each question shall carry 10 marks. A candidate is expected to limit his answer in about 200 words for each question.

Part (A)

Total Marks: 50 X 1 = 50

Q1.Who said that members of the same species are not alike?
- (a) Darwin
- (b) Herbert Spencer
- (c) Best
- (d) Good

Q2. A statistical measure based upon the entire population is called parameter while measure based upon a sample is known as
- (a) Sample parameter
- (b) Inference
- (c) Statistic
- (d) None of these

Q3. Generalized conclusion on the basis of a sample is technically known as
- (a) Statistical inference of external validity of the research
- (b) Data analysis and interpretation
- (c) Parameter inference
- (d) All of the above

Q4. A researcher selects a probability sample of 100 out of the total population. It is
- (a) A cluster sample
- (b) A random sample
- (c) A stratified sample
- (d) A systematic sample

Q5. A researcher divides the population into Postgraduates, graduates and 10+2 students and using the random digit table he selects some of them from each. This is technically called
- (a) stratified sampling
- (b) stratified random sampling
- (c) representative sampling
- (d) none of these

Part (B)

Total Marks: 5 X 10 = 50

Q1. Prove that if f is a continuous mapping of a compact metric space X in to a metric space Y. Then f is uniformly continuous.

Q2. State and prove Baire's Theorem.

Q3. State and prove Couchy Schwartz Inequality.

Q4. Let L be a limit dimensional linear space and let M_1, M_2 be subspaces of L such that

$L= M_1+ M_2$ and dim $L= M_1$ $L=\dim M_2$
Then, $L = M_1,\oplus M_2$

Q5. State and prove Morera's theorem.

Q6. Given the values

X_i	5	7	11	13	17
Y_i	150	392	1452	2366	5202

Evaluate f(a) using:

(i) Langrange's formula
(ii) Newton's divided difference formula

Q7. Discuss the motion of particle moving under a central force.

Q8. Show that the transformation defined by

$q= \sqrt{[2P]Sin}\ Q$

$p= \sqrt{[2P]Sin}\ Q$ is conical.

Caution: Please note that the questions appearing above in this sample paper are only for the guidance of the candidates.