SAMPLE PAPER GAT-SUBJECTIVE
FOR

- **PhD (Mathematics)**

S.No	Core Areas	Questions	Total Questions	Percentage
VERBAL				
1	Synonyms	4	20	20%
	Antonyms	4		
	Use of Preposition	4		
	Reading Comprehension	8		
ANALYTICAL REASONING				
2	Logical Analysis	10	20	20%
	Analytical Reasoning	10		
SUBJECTIVE				
3	Foundation of Mathematics	2	60	60%
	Elementary Mathematics	5		
	Calculus	10		
	Algebra	5		
	Complex Analysis	4		
	Differential Equation	6		
	Analytic Geometry	2		
	Vectors	4		
	Number Theory	2		
	Real Analysis	4		
	Functional Analysis	4		
	Computational Mathematics	5		
	Mechanics	4		
	Mathematical Statistics & Probability	3		

Total Questions: 100
Total Time: 120 Minutes

1. **VERBAL :(20%)**

VOCABULARY: SYNONYMS (04 Questions)

Instructions: Sentences are given below with a word underlined in each. Below each sentence a multiple choice is given. Find out the proper word that is **similar in meaning** to the underlined word in each sentence, and shade its answer letter from multiple choice of words A, B, C or D against the corresponding number in the answer sheet.

1. Love is a passion that inspires one to make <u>marvels</u>.
A. miracles   B. puzzles   C. wonders   D. mazes

2. Love prepares man to <u>surmount</u> great heights and achieve brilliant success.
A. overcome   B. subdue   C. vanquish   D. defeat

VOCABULARY: ANTONYMS (04 Questions)

Instructions: Sentences are given below with a word underlined in each. Below each sentence a multiple choice is given. Find out the proper word that is **opposite in meaning** to the underlined word in each sentence, and shade its answer letter from multiple choices of words A, B, C or D against the corresponding number in the answer sheet.

1. The romantic gestures <u>testify</u> that every person is lover of one's own self.
A. falsify   B. justify   C. intensify   D. rectify

2. You are <u>enamoured</u> of only their physical qualities.
A. bored   B. disgusted   C. annoyed   D. proud

USE OF PREPOSITIONS (04 Questions)

Instructions: Sentences are given below. In each sentence, you have to put the correct preposition. Choose **the correct preposition** for every sentence and shade its answer letter A,B,C or D against the corresponding number in the answer sheet.

1. I came…………………an old friend of mine in Liberty Market this morning.
A. around   B. by   C. across   D. with

2. The region is noted………………its quality cattle.
A. for   B. by   C. on   D. to

PASSAGE READING (8 Questions)

Reading Comprehension

Read the following passage carefully and answer the questions set below it. Write answer letter A,B,C,D in the answer sheet against the corresponding number.

Long ago when invention of printing press was not yet conceived and made possible, a large number of useful, precious, and rare books were printed and read in manuscript forms. Paper had not yet come in to being. It was china that invented paper first. Later, perhaps in 1560 or so, John Caxton, an Englishman, invented the printing press. Other countries of Europe were yet far behind in these regards. With the invention of printing press tens of scores of books were brought to the printing press for publication. Book markets were created and public libraries established for general reading public. Private libraries and reading rooms came in to existence. Book reading became habit of knowledge seekers. Bibliophiles tended to read books to seek knowledge, know good morals and get entertainment, the last being the most important objective of reading. Rate of literacy increased largely, horizon of knowledge broadened and scope of academic and human development widened to a great extent. Today, keen readers are found all over the world, especially in the countries where education is given due attention and importance. But, regretfully, owing to creation of a host of scientific inventions and devices and role of electronic media, impetus and tendency to reading are diminishing slowly and gradually. And a result, reading is becoming a dying habit.

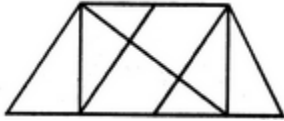**1. Before the invention of the paper and printing press books were preserved in ………**
A. memory of readers
B. memory of authors
C. handwritten form
D. in printed form

2. Public Libraries were established for………
A. literate People
B. highly educated people
C. every reader from public
D. scholars

2. ANALYTICAL REASONING: (20% Questions)

1. Find the number of triangles in the given figure.
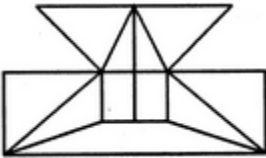

A. 8   B. 10

C. 12   D. 14

2. Find the minimum number of straight lines required to make the given figure.

A. 16   B. 17

C. 18   D. 19

3. **SUBJECTIVE: (60%)**

1. If F be a vector field then which of represents that F is irrotational?

    A. $\nabla \cdot F = 0$ B. $\nabla \cdot F > 0$ C. $\nabla \times F = 0$ D. $\nabla \times F > 0$

2. Consider the set S of all order pairs of real numbers. Let * be an associative binary operation defined on S by the rule $(a,b)*(c,d) = (ad + bc, bd)$. Then $(1,2)*(3,5)*(3,4) = ?$

    A. (74, 40)   B. (32, 40)   C. (23, 11)   D. (7, 11)

3. The Wronskian of the functions $y_1(x) = e^x, y_2(x) = e^{-x}$ is:

    A. $-e^{2x}$ B. $-3e^{2x}$ C. $-6e^{2x}$ D. $6e^{2x}$

4. In theory of Complex analysis an analytic function must satisfy:
    A. Laplace equation   B. Heat equation   C. Cauchy-Riemann equations   D. Wave equation