

GATE 2022 Exam Pattern

Particulars	Details
Examination Mode	Computer Based Test (Online)
Duration	3 Hours
Number of Papers in GATE 2022	29 Papers
Section	General Aptitude (GA) Candidate Selected Subject
Type of Questions	Multiple Choice Questions (MCQs) Multiple Select Questions (MSQs) Numerical Answer Type (NAT) Questions
Design of Questions	The questions are designed to test the listed abilities Application Analysis Comprehension Recall Synthesis
Number of Questions	65 Questions (including 10 questions from General Aptitude)
Distribution of Questions in all Papers except AR, CY, EY, GG, MA, PH and XL	Engineering Mathematics - 13 Marks Subject Questions - 72 Marks General Aptitude - 15 Marks
Distribution of Questions in AR, CY, EY, GG, MA, PH, XH and XL	Questions from Subject Concerned - 85 Marks General Aptitude - 15 Marks
Total Marks	100 Marks
Marking Scheme	All of the questions will be worth 1 or 2 marks
Negative Marking	Two types of MCQs: MCQs - 1 mark for each correct answer; 1/3 mark will be deducted for every wrong answer. MCQs - 2 marks for each correct answer; 2/3 mark will be deducted for every incorrect response. There are no negative marking for Numerical Answer Type (NAT) questions NO negative marking for MSQ & NAT.

GATE 2022 Exam Pattern - Marking Scheme

GATE Paper Code	General Aptitude (GA) Marks	Subject Marks	Total Marks	Total Time (Minutes)
AE, AG, BM, BT, CE, CH, CS, CY, EC, EE, ES, EY, IN, MA, ME, MN, MT, NM, PE, PH, PI, TF, ST	15	85	100	180
AR [Part A + Part B (B1: Architecture or B2: Planning)]	15	60 + 25	100	180
GE [Part A + Part B (Section I or Section II)]	15	55 + 30	100	180
GG [Part A + Part B (Section 1: Geology or Section 2: Geophysics)]	15	25 + 60	100	180
XE (Section A + Any TWO Sections)	15	15 + (2 x 35)	100	180
XH (Section B1 + Any ONE Section)	15	25 + 60	100	180
XL (Section P + Any TWO Sections)	15	25 + (2 x 30)	100	180

Paper Code	Paper GATE 2022
AE	Aerospace Engineering
AG	Agricultural Engineering
AR	Architecture and Planning
BT	Biotechnology
BM	Biomedical Engineering
CE	Civil Engineering
CH	Chemical Engineering
CS	Computer Sc. and Information Technology
CY	Chemistry
EC	Electronics and Communication Engg.
EE	Electrical Engineering
ES	Environmental Science and Engineering
EY	Ecology and Evolution
GG	Geology and Geophysics
IN	Instrumentation Engineering
MA	Mathematics
ME	Mechanical Engineering
MN	Mining Engineering
MT	Metallurgical Engineering
PE	Petroleum Engineering
GE	Geomatics Engineering (New)
NM	Naval Architecture and Marine Engineering (New)
PH	Physics
PI	Production and Industrial Engineering
ST	Statistics

Paper Code	Paper GATE 2022
TF	Textile Engineering and Fibre Science
XE-A	Engineering Mathematics
XE-B	Fluid Mechanics
XE-C	Materials Science
XE-D	Solid Mechanics
XE-E	Thermodynamics
XE-F	Polymer Science and Engineering
XE-G	Food Technology
XE-H	Atmospheric and Oceanic Sciences
XH-B1	Reasoning and Comprehension
XH-C1	Economics
XH-C2	English
XH-C3	Linguistics
XH-C4	Philosophy
XH-C5	Psychology
XH-C6	Sociology
XL-P	Chemistry
XL-Q	Biochemistry
XL-R	Botany
XL-S	Microbiology
XL-T	Zoology
XL-U	Food Technology

Why GATE Exam is Important

The purpose of the GATE exam is to test students' knowledge and understanding of their **basic engineering and science subjects**. **Every year thousands of engineering graduates leave engineering schools and universities**. In today's competitive landscape, measuring and testing the **quality** of engineering students is **only possible** through the GATE exam.

There is a **misunderstanding** among students that the GATE is only for ME. /**M.Tech**, which **ultimately only leads** to a teaching career. **However, this** is not correct. **The candidate's GATE** score is also used by **various Public Enterprises (PSUs)** (i.e., **state-owned** companies **such as Indian Oil, GAIL, and Hindustan Petroleum, etc.**) for **CSIR scholarship programs and fellowships at ME / M.Tech** and many more.

- To pursue M.E./ M.Tech./ M.Sc programs in any of the leading institutes in the country
- Master's degree leads to specialization and cultivates and brings out best of your interest in a certain area which may lead to research / Ph.D.,
- More domain specific companies recruit through campus recruitment in leading Institutes.
- Higher salaries are offered for post graduate student when compared to a graduate
- A Masters degree is a must for those wishing to apply for Faculty/Research positions in educational institutes and most of the R&D centers.
- Scholarship of Rs 8000/- is paid during masters course; so no dependency to parents for financial needs.
- GATE qualified candidates are also eligible for the award of Junior Research Fellowship in CSIR Laboratories and CSIR sponsored projects.
- More than 37 PSUs (Public Sector Undertakings-government organizations), like BARC, IOCL etc. prescribe GATE qualification as a requirement.
- Based on the GATE score, some of the foreign universities (Like NTU, Singapore) offer Ph.D. positions without any GRE score.
- Most importantly to get to be a part of any nationally reputed Educational Institute and enjoy learning and research in the conducive ambience.
- One gets intellectual satisfaction from working in the area of interest.
- Last but not the least, Fellowship Program in management (FPM)

Enrolment through GATE score card.

Stipend of 22,000- 30,000

Preparation Ideas for GA Section in Gate Exam.

The General Aptitude section accounts for 15 marks and consists of 10 questions. Of these, 5 questions carry 1 mark each while the other 5 questions fetch you 2 marks each.

The test is broadly classified under two heads; Verbal and Numerical Ability.

Part 1: Verbal Ability: This consists of English Grammar, Verbal Analogies Sentence Completion, Word Groups, Critical Reasoning, Instructions and Verbal Deduction.

Part 2: Numerical Ability: This comprises Numerical Reasoning, Numerical Computation, Numerical Estimation and Data Interpretation.

Tips for Excellence in GA

General aptitude is the easiest section of the GATE test to achieve, but it is important to brush up on the basics and prepare in advance.

Refer to your Class X grammar book (CBSE / NCERT) to improve your grammar skills.

Learn 10 new words and use them every day to improve your vocabulary.

Once a week, practice reading a short passage and try to describe it in a few points; this will help you with reading and understanding.

Try to solve language puzzles and analogies every day.

Since the Number Skills section focuses on approximation skills, practice calculating without a calculator and increase your speed.

Study all the mathematical basics from your textbooks for class X.

Practice sample papers / papers from previous years together with your specialist paper so that you feel comfortable when you answer and rethink from one format to another. This will also help you understand the patterns and style of the questions.

Appendix C: Syllabus Content

GA| General Aptitude

Verbal Aptitude

Basic English grammar: tenses, articles, adjectives, prepositions, conjunctions, verb-noun agreement, and other parts of speech Basic vocabulary: words, idioms, and phrases in context Reading and comprehension Narrative sequencing

Quantitative Aptitude

Data interpretation: data graphs (bar graphs, pie charts, and other graphs representing data), 2- and 3-dimensional plots, maps, and tables Numerical computation and estimation: ratios, percentages, powers, exponents and logarithms, permutations and combinations, and series Mensuration and geometry Elementary statistics and probability

Analytical Aptitude

Logic: deduction and induction, Analogy, Numerical relations and reasoning

Spatial Aptitude

Transformation of shapes: translation, rotation, scaling, mirroring, assembling, and grouping Paper folding, cutting, and patterns in 2 and 3 dimensions

Sample Questions

Verbal Aptitude:

- Out of the following four sentences, select the most suitable sentence with respect to grammar and usage.
 - I will not leave the place until the minister does not meet me.
 - I will not leave the place until the minister doesn't meet me.
 - I will not leave the place until the minister meet me.
 - I will not leave the place until the minister meets me.

ANSWER: D

- Indian currency notes show the denomination indicated in at least seventeen languages. If this is not an indication of the nation's diversity, nothing else is. Which of the following can be logically inferred from the above sentences?
 - India is a country of exactly seventeen languages.
 - Linguistic pluralism is the only indicator of a nation's diversity.
 - Indian currency notes have sufficient space for all the Indian languages.
 - Linguistic pluralism is strong evidence of India's diversity.

ANSWER: D

- The unruly crowd demanded that the accused be _____ without trial.

- hanged
- hanging
- hankering
- hung

ANSWER: A

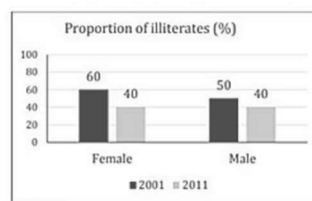
- Archimedes said, "Give me a lever long enough and a fulcrum on which to place it, and I will move the world." The sentence above is an example of a _____ statement.

- figurative
- collateral
- literal
- figurine

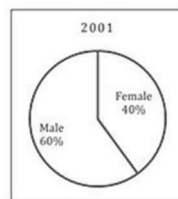
ANSWER: A

Quantitative Aptitude:

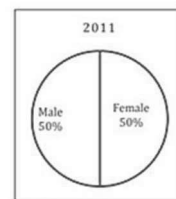
- The bar graph in Panel (a) shows the proportion of male and female illiterates in 2001 and 2011. The proportions of males and females in 2001 and 2011 are given in panel (b) and (c) respectively. The total population did not change during this period. The percentage increase in the total number of literates from 2001 to 2011 is -----



Panel (a)



Panel (b)



Panel (c)

- 30.43
- 33.43
- 34.43
- 35.43

ANSWER: A

- If $pqr \neq 0$ and $p^{-x} = \frac{1}{q}$, $q^{-y} = \frac{1}{r}$, $r^{-z} = \frac{1}{p}$, what is the value of the product xyz ?

- 1
- $\frac{1}{pqr}$
- 1
- pqr

ANSWER: C

- An e-mail password must contain three characters. The password has to contain one numeral from 0 to 9, one upper case and one lower case character from the English Alphabet. How many distinct passwords are possible?

- 6,760
- 13,520
- 40,560
- 1,05,456

ANSWER: C

8. The area of a square is d . What is the area of the circle which has the diagonal of the square as its diameter?

(A) πd (B) πd^2
 (C) $\frac{\pi d^2}{4}$ (D) $\frac{1}{2}\pi d$

ANSWER: D

Analytical Aptitude:

9. Computers were invented for performing only high-end useful computations. However, it is no understatement that they have taken over our world today. The internet, for example, is ubiquitous. Many believe that the internet itself is an unintended consequence of the original invention. With the advent of mobile computing on our phones, a whole new dimension is now enabled. One is left wondering if all these developments are good or, more importantly, required. Which of the statement(s) below is/are logically valid and can be inferred from the above paragraph?

- (i) The author believes that computers are not good for us.
 (ii) Mobile computers and the internet are both intended inventions.

(A) (i) only (B) (ii) only
 (C) both (i) and (ii) (D) neither (i) nor (ii)

Answer D

10. Some students were not involved in the strike
 If the above statement is true, which of the following conclusions is/are logically necessary?

- (i) Some who were involved in the strike were students.
 (ii) No student was involved in the strike
 (iii) At least one student was involved in the strike
 (iv) Some who were not involved in the strike were students.

(A) (i) and (ii) (B) (iii)
 (C) (iv) (D) (ii) and (iii)

Answer C.

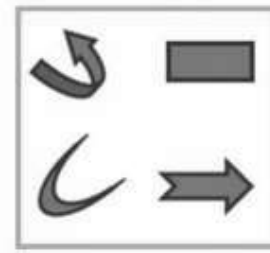
Spatial Aptitude:

11. A rectangular sheet of length 6cm and breadth 4cm is coiled to form an open cylinder (say, P) such that the breadth sides meet. The same sheet can also be coiled to form a cylinder (say, Q) such that the length sides meet. Which one of the following statements is FALSE?

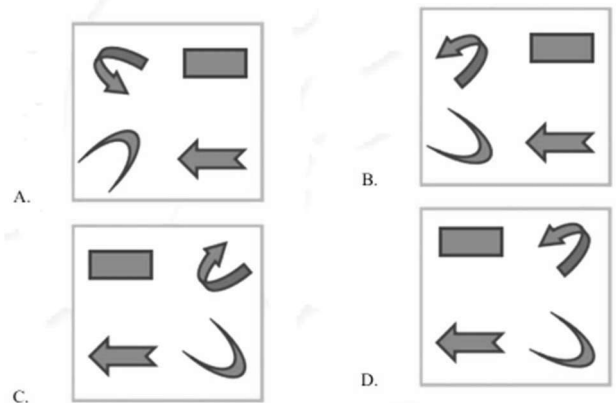
- (A) Surface area of the open cylinders P and Q are equal.
 (B) Volume of P and Volume of Q are equal.
 (C) Volume of P is greater than that of Q.
 (D) The height of cylinder Q is greater than that of P.

Answer: B

12.



Which one of the following closely resembles the mirror image of the above figure?



Answer: C

INDEX		
SECTION – I: QUANTITATIVE APTITUDE		
CHAPTER NO.	CHAPTER NAME	PAGE NO.
1	NUMERICAL ABILITY	1
2	PERCENTAGE AND RATIO	26
3	PERMUTATIONS & COMBINATIONS	53
4	PROBABILITY & STATISTICS	64
5	SPEED, DISTANCE AND TIME	86
6	DIRECTION SENSE TEST	99
7	WORK AND TIME	103
8	GEOMETRY AND HIGHER MATHS	113
SECTION – II: LOGICAL REASONING & DATA INTERPRETATION		
CHAPTER NO.	CHAPTER NAME	PAGE NO.
1	DATA INTERPRETATION	150
2	SYLLOGISM AND VENN DIAGRAM	198
3	SEATING ARRANGEMENTS AND BLOOD RELATIONSHIP	211
SECTION – III: VERBAL ABILITY (VOCABULARY)		
CHAPTER NO.	CHAPTER NAME	PAGE NO.
1	VERBAL ANALOGY	218
2	VOCABULARY	224
3	SYNONYMS & ANTONYMS	238
VERBAL ABILITY (GRAMMAR)		
1	PART OF SPEECH	248
2	TENSES	252
3	PREPOSITION	256
4	DEGREES OF COMPARISON	263
5	MODAL AUXILIARIES	268
6	NOT ONLY.....BUT ALSO	274
7	ERROR CORRECTION	278

VERBAL ABILITY (READING COMPREHENSION)

CHAPTER NO.	CHAPTER NAME	PAGE NO.
1	READING COMPREHENSION	284

**SECTION – IV:
SPATIAL APTITUDE**

CHAPTER NO.	CHAPTER NAME	PAGE NO.
1	MIRROR IMAGES	310
2	WATER IMAGES	317
3	SPOTTING OUT THE EMBEDDED FIGURE	322
4	COMPLETION OF INCOMPLETE PATTERN	333
5	FIGURE MATRIX	346
6	PAPER FOLDING	354
7	PAPER CUTTING	362

MODEL TEST PAPER

PAPER NO.	MODEL TEST	PAGE NO.
1	MODEL TEST - 1	371
2	MODEL TEST - 2	372
3	MODEL TEST - 3	373
4	MODEL TEST - 4	375
5	MODEL TEST - 5	377
6	MODEL TEST - 6	378
7	MODEL TEST - 7	379
8	MODEL TEST - 8	381
9	MODEL TEST - 9	383
10	MODEL TEST - 10	385

SECTION – I

QUANTITATIVE APTITUDE

NUMERICAL ABILITY

—: Gate - General Aptitude:—

A number is an arithmetical value, expressed by a symbol or word, representing a particular quantity or amount and used in counting and making calculations.

1.1 Different Types of Numbers

1.1.1 Natural Numbers

The counting numbers are called natural numbers. Natural numbers do not include 0 or any negative numbers.

Example: 1, 2, 3, 4... are all-natural numbers.

1.1.2 Whole Numbers

All counting numbers and 0 (zero) together form the set of whole numbers. They do not include negative numbers.

Example: 0, 1, 2, 3, 4... are whole numbers.

1.1.3 Integers

All counting numbers including 0 and the negatives of the counting numbers form the set of integers.

Example: -3, -2, -1, 0, 1, 2, 3... are all integers.

Set of positive integers = {1, 2, 3, 4, 5, 6...}

Set of negative integers = {-1, -2, -3, -4, -5, -6...}

Set of non-negative integers = {0, 1, 2, 3, 4, 5, 6...}

1.1.4 Even Numbers and Odd Numbers

An integer which is exactly divisible by 2 is called an even number. While an integer which cannot be exactly divisible by 2 is called an odd number.

Example: -6, -4, -2, 0, 2, 4, 6, 8, 10... are all **even numbers**.

Zero is considered an even number.

While an integer which cannot be exactly divisible by 2 is called an odd number.

Example: -5, -3, -1, 1, 3, 5, 7, 9, 11... are all **odd numbers**.

1.1.5 Prime Numbers

A natural number other than 1 is a **prime number** if it is divisible by 1 and itself only.

Example: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43 and 47 are the prime numbers less than 50.

Test to find whether a given number is a prime:

Step 1:

Select a least positive integer n such that $n^2 >$ given number

Step 2:

Test the divisibility of a given number by every prime number less than n .

Step 3:

The given number is prime only if it is not divisible by any of these primes.

Example: Check whether 571 is a prime number

Since $(23)^2 = 529 < 571$ and $(24)^2 = 576 > 571$

So, $n = 24$

Prime numbers less than 24 are 2, 3, 5, 7, 11, 13, 17, 19, 23.

Since 571 is not divisible by any of these primes, therefore 571 is a prime number.

Example: Check whether 923 is a prime number.

Since $30^2 = 900 < 923$ and $31^2 = 961 > 923$

So, $n = 31$

Prime numbers less than 31 are 2, 3, 5, 7, 11, 13, 17, 19, 23, 29

Since 923 is divisible by 13, 923 is not a prime number

1.1.6 Composite Numbers

Natural numbers greater than 1 which are not prime are known as **composite numbers**.

Example: 9 can be divided by 3 (as well as 1 and 9), so 9 is a composite number similarly 12 can be divided by 2, 3, 4 and 6, so it is also a composite number.

Note:

1. The number 1 is neither a prime number nor a composite number.
2. The number 2 is the only even number which is prime

1.1.7 Rational Numbers

A rational number is a number that can be represented as a ratio or fraction in which both the numerator and the denominator are whole numbers.

The number 18 can be said to a rational number because it can be written as the fraction $\frac{18}{1}$.