SAMARA UNIVERSITY

Tutorial/Orientation for NGAT Takers

Organized by: Academic Affairs Vice President Office

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Introduction

The National Graduate Admission Test (NGAT) is a general aptitude test *designed by MoE* to assess *verbal, quantitative, Critical/analytical reasoning abilities and professional* carriers thinking as predictors of success in graduate studies.

Test type: Computer based multiple choice test.

Duration: 3 hours.

Certificate Validity: 2 years

Number of items and weight

S.No	Topics	Number of items	Share in %	Remark
1	Verbal Reasoning	51	34	
2	Quantitative Reasoning	33	22	
3	Critical Thinking/ Reasoning	21	14	
4	Professional Career Reasoning	45	30	
	Total	***150***	***100***	
Pass mark: 50%				

Themes (Group) for Professional competence test

1. Engineering
2. Life Sciences
3. Physical Sciences
4. Computational Sciences
5. Medical and Health Sciences
6. Animal Sciences
7. Plant Sciences
8. Business and Economics
9. Education Related Programs
10. Social Sciences
11. Humanities
12. Language, Folklore and Communications

Professional Career Reasoning

Purpose: This test assesses the candidate's job area conduciveness, past work aligns with their education, and candidates fit with a career based on personality traits.

It covers *rules for conduct, public interest, and professional responsibility of the diverse professions*.

Examples: Quantitative reasoning

Example 1 (Percentage Increase):

A laptop originally costs $800. During a sale, the price is reduced by 15%. What is the new price of the laptop?

Solution:

1. Calculate the amount of the discount:

   Discount = 15% of $800 = $0.15 \times 800 = \$120$.

2. Subtract the discount from the original price:

   New Price = Original Price - Discount

   = $800 - $120 = **$680**.

Example 2 (Ratio):

The ratio of the number of apples to oranges in a basket is 3:2. If there are 24 apples, how many oranges are there?

Solution:

1. Set up the ratio: Let the number of oranges be x. According to the ratio, $3/2 = 24/x$.

2. Cross-multiply to solve for x:

$$3x = 48.$$

3. Divide by 3:

$$x = 48/3 = 16.$$

Answer: There are 16 oranges.

Example 3 (Simple Interest):

If you invest 10,000 Birr at an annual simple interest rate of 5% for 3 years, what will be the total amount at the end of the investment period?

Solution:

1. Use the formula for simple interest:

Interest = Principal × Rate × Time

Interest = Birr 10,000 × 0.05 × 3 = Birr 1, 500.

2. Add the interest to the principal to find the total amount:

Total Amount = Principal + Interest = Birr 10,000 + Birr 1,500 = Birr 11,500.

Answer: The total amount at the end of the investment period is Birr 11,500.

Example 4 (Working Together):

If Machine A can complete a job in 4 hours and Machine B can complete the same job in 6 hours, how long will it take for both machines working together to complete the job?

Solution:

1. Calculate the work done by each machine in one hour:

   Machine A's rate = 1/4 of the job per hour.

   Machine B's rate = 1/6 of the job per hour.

2. Add their rates together:

   Combined Rate = 1/4 + 1/6.

   To add, find a common denominator (12):

   Combined Rate = 3/12 + 2/12 = 5/12 of the job per hour.

3. To find the time taken to complete the job together:

   Time = 1/Combined Rate = 1/5/12 = 12/5 hours = 2.4 hours.

Answer: It will take both machines working together 2.4 hours to complete the job.

Example 5 (Simple Equations):

Solve for x in the equation: $3x + 7 = 22$.

Solution:

1. Subtract 7 from both sides:

   $3x = 22 - 7$

   $3x = 15$.

2. Divide both sides by 3:

   $x = 15/3 = 5$.

   Answer: $x = 5$.

Example 6 (Pattern Recognition):

Identify the next number in the sequence: 2, 4, 8, 16, ___?

Solution:

The pattern is that each number is multiplied by 2 to get the next number:

$2 \times 2 = 4$

$4 \times 2 = 8$

$8 \times 2 = 16$

Continuing this pattern:

$16 \times 2 = 32$

Answer: The next number in the sequence is 32.

Example 7 (Comparison of quantities):

Given two quantities, one in column A and one in column B. Compare the two quantities.

Column A	Column B
$a = b$ $a < c$	
$2a$	$b + c$

Solution: Add a on both sides of a<c gives

$$a + a < a + c$$
$$2a < a + c$$

But $a = b$ and hence replacing a with b in the right hand side, we get $2a < b + c$

Therefore, **the quantity in Column B is greater.**

Example 8 (Work man hours):

If 6 men can complete a work in 15 hours. Then how many hours it will take if 10 men working on the same speed completes the work?

Solution:

1. Calculate the total work in man-hours.

Total Work = Number of Men×Time

= 6 men× 15 hours = 90 man-hours

2. Calculate the time taken by 10 men:

Total Work = Number of Men× T

90 = 10 × T

3. Solve for T:

T = 90/10 = 9 hours

Therefore, it will take 9 hours for 10 men to complete the work.

Critical thinking

Example 1(Logical Deduction):

All cats are mammals. Some mammals are not dogs. Therefore, which of the following statements is true?

1. Some cats are dogs.
2. No cats are dogs.
3. All mammals are cats.
4. All dogs are mammals.

Solution:

Statement 1: Incorrect, as it contradicts the given information.

Statement 2: True, because if all cats are mammals and some mammals are not dogs, then it logically follows that no cats can be dogs.

Statement 3: Incorrect, as it is not supported by the premises.

Statement 4: True, but does not relate to the conclusion drawn from the premises.

Answer: Statement 2 is true: No cats are dogs.

Example 2 (Syllogism):

Consider the following statements:

1. All birds have feathers.
2. A penguin is a bird.

What conclusion can be drawn?

1. Penguins have feathers.
2. All birds can fly.
3. Some birds cannot swim.

Solution:

Statement 1 follows logically from the premises: Since all birds have feathers and a penguin is a bird, it must also have feathers.

Statement 2 does not follow from the premises; not all birds can fly (e.g., ostriches).

Statement 3 cannot be concluded from the given information.

Answer: Conclusion 1 is correct: Penguins have feathers.

Example 3 (Family Relations):

John’s mother has three children: Mike, Sarah, and…... Who is the third child?

Solution:

The question states "John’s mother," indicating that John is also one of her children.

Answer: The third child is John

Example 4 (Venn Diagrams):

In a class of students, all students study mathematics. Some students study science. Which of the following statements is true?

1. All students who study science study mathematics.
2. Some students who study mathematics do not study science.
3. All students in the class study science.

Solution:

Statement 1 must be true since all students study mathematics and some study science.

Statement 2 cannot be concluded from the information provided; it is possible but not certain.

Statement 3 is false because not all students study science; only some do.

Answer: Statement 1 is true: All students who study science study mathematics

Example 5 (Evaluating Arguments):

A recent study found that people who eat a lot of fruits and vegetables have lower rates of heart disease. Therefore, eating fruits and vegetables will reduce your risk of heart disease.

Which of the following is the MOST SERIOUS flaw in the above argument?

A) The study did not involve a control group.

B) The study did not take into account other factors that might affect heart disease.

C) The study was not conducted over a long enough period of time.

D) The study did not prove that eating fruits and vegetables causes a reduction in heart disease.

Answer: D

Explanation: While the study shows a correlation, it doesn't establish causation. There could be other factors contributing to the lower heart disease rates among those who eat more fruits and vegetables.

Example 6 (Identifying Assumption): Given an argument.

All dogs are mammals. Spot is a mammal. Therefore, Spot is a dog.

Which of the following is the UNSTATED assumption in the above argument?

A) All mammals are dogs.

B) Only dogs are mammals.

C) All mammals have fur.

D) Some mammals are dogs.

Answer: A.

Explanation: The argument assumes that if something is a mammal, it must be a dog. This is not a valid assumption.

Example 7 (Deductive Reasoning):

All squares are rectangles. Figure A is a square. Therefore, Figure A is a _____.

A) Triangle

B) Circle

C) Rectangle

D) Pentagon

Answer: C

Additional Resources

For practice exercises and related information:

1) Channel name: "NGAT 2017 Candidates Training Group" telegram group

link: https://t.me/sungattu

2) Channel name: "GAT Exam (Graduate Admission Test) for MSc and PhD students" telegram channel

link: https://t.me/GATExamAAU

For official information

- **MoE:**

Channel name: GAT (Graduate Admission Test) Exam

Channel link: https://t.me/GATExams

- **Samara University**

Telegram channel: Samara University of Ethiopia

Link: https://t.me/SamaraUniversityEthiopia

Facebook: Samara University, Samara, Ethiopia

Thank You!!!!

Wishing you all the best in your exam!

Your hard work will pay off.