

NOT FOR SALE



A PRIM ER



on the

DOST - SEI

Junior Level Science
SCHOLARS
HIP

Examination

Page 1 of 16

FOREWORD



In its commitment to help increase the number of young people who will go into the specialized fields in science and technology, the Department of Science and Technology (DOST) through the Science Education Institute (SEI) is offering the Junior Level Science Scholarships (JLSS) under Republic Act No. 7687, Republic Act No. 10612, and Merit Programs. These scholarships are made available to talented third year college students enrolled in priority science and technology courses at identified

tertiary institutions nationwide. To be able to qualify for the scholarships, the applicants must pass the JLSS Examination.

Thus, our Institute ushers in the publication of **A Primer on the DOST-SEI Junior Level Science Scholarship Examination** that will benefit the students in preparing for the highly competitive scholarship examination and eventually qualify for the S&T Scholarships.

Through the JLSS Program, DOST-SEI hopes to produce scholar-graduates equipped with excellent skills who will have successful careers in science and technology and become the country's future science leaders and innovators.


JOSETTE T. BIYO, Ph.D.
Director

A PRIMER ON THE JUNIOR LEVEL SCIENCE SCHOLARSHIP EXAMINATION

ABOUT THE EXAMINATION

The Junior Level Science Scholarship (JLSS) Examination for scholarship applicants under RA 7687, RA 10612, and Merit Programs is primarily a multiple-choice test consisting of two (2) parts with several sub-parts which are separately timed. If you finish a part before the allotted time, you will not be allowed to proceed to the next part but you can use your time wisely by reviewing your answer for that particular part only.

You will take the examination in one sitting for approximately four (4) hours. This includes the reading of instructions, filling-out of forms and the actual testing. Hence, you will not be allowed to leave the room once the test starts except to the comfort room, when necessary.

In the following sections of the Primer, a listing of topics is made available for you as guide to help you achieve your best performance in the JLSS Examination. Sample test items are also presented for some parts of the test for you to get familiarized with the type of questions you will encounter in the different parts of the test.

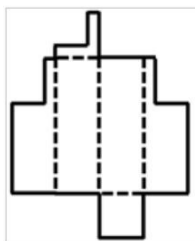
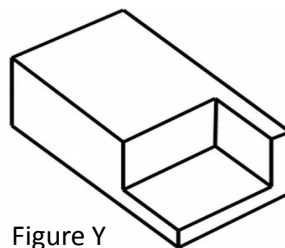
PART I: LOGICAL REASONING TEST

Logical Reasoning Test has three (3) sub-parts, namely:

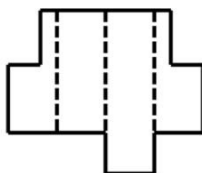
A. Spatial Reasoning measures your ability to recreate visual experiences and reasoning about shape, measurement, depiction and navigation. It also tests your ability to mentally rotate and manipulate two dimensional and three dimensional spaces.

Sample Item No. 1:

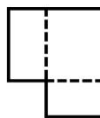
Which two folding patterns below can be joined together to form Figure Y?



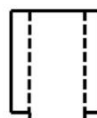
I



II



III



IV

A. I and IV

B. II and III

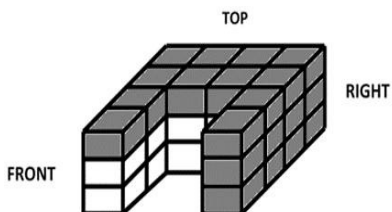
C. I and III

D. II and IV

Correct Answer: C

Sample Item No. 2:

What is the resulting volume if the darkened layers of a solid consisting of identical blocks as shown below are removed?



A. 20

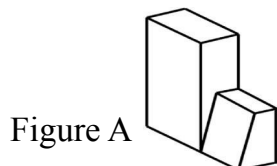
B. 16

C. 10

D. 28

Correct Answer: B

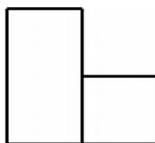
Sample Item No. 3:



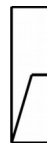
has the following views:



TOP

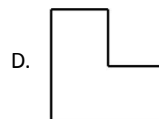
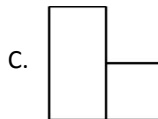


FRONT



SIDE

Which of the following shows the rear view of Figure A?

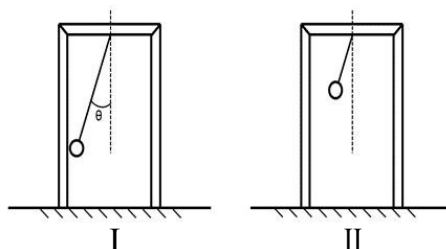


Correct Answer: B

B. Mechanical Reasoning will measure your ability to comprehend mechanical and physical concepts and principles. It also measures your ability to understand, analyze and visualize the movement and interaction of different mechanical components.

Sample Item No. 1:

Pendulums I and II are shown on the right. If they are released from the same angle at the same time, which of the following statements will be TRUE?

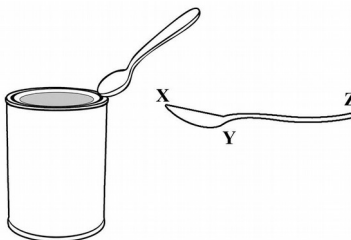


- A. Pendulums I and II will move at the same time.
- B. Pendulums I and II will stop at the same time.
- C. Pendulum I will be the last to stop.
- D. Pendulum I will have more oscillations than Pendulum II.

Correct Answer: C

Sample Item No. 2:

A spoon is used to pry open the lid of a can of biscuits. Which of the following will work better?



- A. Apply an upward force on Z and a fulcrum at Y
- B. Apply a downward force on Z and a fulcrum at Y
- C. Apply an upward force on Y and a fulcrum at Z
- D. ALL will work equally well

Correct Answer: B

C. Verbal Reasoning tests your ability to understand, analyze and interpret information. It also measures your ability to extract meaning from complex information and to think logically and analytically.

Sample Item No. 1:

Unlike the other interviewees, the last applicant interviewed conducted herself with commendable _____ despite her being repeatedly asked annoying questions.

A. decorum

C. patience

B. ferocity

D. belligerence

Correct Answer: A

Sample Item No. 2:

carbohydrates : glucose :: proteins : _____

A. glycogen

C. albumins

B. citric acid

D. lipids

Correct Answer: C

Sample Item No. 3:

dichotomy : _____

A. plant

C. struggle

B. division

D. religious office

Correct Answer: B

PART II: POWER TEST

Power Test includes sub-tests in Science, Engineering, Mathematics, Information and Communications Technology (ICT), English and Teaching Aptitude.

Coverage of the of the Power Test for the different groups of scholarship applicants:

Applicants enrolled in	Sub-tests
Engineering	Engineering, Math, English, Teaching Aptitude
Science	Science, Math, English, Teaching Aptitude
Math	Math, Science, English, Teaching Aptitude
ICT	ICT, Science, Math, English, Teaching Aptitude

According to your specialization, following are the topics which you may review for the JLSS Exam:

1. SCIENCE

1.1. Biology: Cell/Cell Cycle/Cell Transport System;
Energy Transformation; Organismal Biology;
Genetics; and Evolution

1.2. Chemistry: Matter; Atomic Structure; Molecules;
Acids and Bases; Chemical Reactions; Solubility;
Stoichiometry; Thermodynamics; Quantum Theory;
Periodic Table; and Chemical Bonding

1.3. Physics: Graphical Analysis; Motion; Friction;
Energy; Momentum; Gravitational Force; Kepler's Law;
Density; Fluids; Waves; Sounds; Ohm's Law; Mirror
Optics; Capacitors; Propagation of Light; and Snell's Law

1.4. *Earth Science:* Rocks; Minerals; Continental Draft Theory; Volcanos; Rock Deformation; Earthquakes; Soil Formation and Erosion; Water Cycle; Earth/Earth History; and Philippine Geology

1.5. *Environmental Science:* Natural Environment; Natural Resources; Human Impact on the Environment; and Emerging Threats and Environmental Management

2. ENGINEERING

2.1. *Physics*

2.2. *Chemistry*

2.3. *Solid Mensuration*

2.4. *Differential Calculus*

2.5. *Pre-Calculus*

3. MATHEMATICS

3.1. *Algebra:* System of Equations; Functions
Inequalities; Sequences; and Expo-log Functions

3.2. *Analytic Geometry:* Distance Formula; Parabola*;
and Ellipse*

3.3. *Probability:* Counting; Simple Events; and
Compound Events

3.4. Trigonometry*: Angle of Elevation or Depression;
and Graph of Functions

3.5. Calculus*: Limits; Derivatives; and Integrals

<i>*Additional coverage for Math majors</i>

4. INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

4.1. Number Systems

4.2. Logic

4.3. Basic Programming

4.4. Algorithmic Steps

4.5. Combinatorics

4.6. Data Storage

4.7. Flow Charting

5. ENGLISH

5.1. Grammar & Syntax

5.2. Vocabulary

5.3. Reading Comprehension

5.4. Linguistic Competence

Sample Items:

Direction: Choose from the underlined words that makes the sentence grammatically incorrect.

I: Can you give me an information as to when and where the
A B C conference will be held?

D

Correct Answer: C

Direction: Read the passage below and answer the questions that follows.

I look forward to the adventure promised by a <i>habal-habal</i> ride now, but on my first ride, I was practically frozen with fear as I sat between the driver and my British co-volunteer. Barely moving a muscle, I was terrified we would fall off on one of the slippery bends, or worse, plummet into a ravine. Later, experience taught me that if I shadowed the driver's movements, I could actually manage to enjoy the trip and reach my destination in one piece.

2: The writer mentions how difficult her first ride was in order to _____.

- A. contrast it with her calmness in later rides
- B. contrast it with later assurance of the driver
- C. demonstrate how difficult it is to ride the *habal-habal*
- D. demonstrate how physically awkward she naturally is

Correct Answer: A

Direction: Choose the best meaning which corresponds to the underlined word. The meaning maybe contextual, idiomatic or metaphoric.

3: Solar inventions have been patented for use as bleaching ivory, drying fruit and treating Irish moss.

- | | |
|---------------------------------|--------------|
| A. protected by legal documents | C. prevented |
| B. manufactured extensively | D. legalized |

Correct Answer: A

Direction: Study the given situation and choose the appropriate response to the question.

4. You are listening to a lecture and you did not quite hear what the lecturer just said. You raise your hand to ask the lecturer to repeat what he/she said. Which of the following will you say?

- | | |
|---------------------------------|--|
| A. How's that again? | c. I didn't quite hear you. |
| B. Please repeat what you said. | D. Could you please repeat what you just said? |

Correct Answer: D

6. TEACHING APTITUDE

This part is an inventory which aims to assess your traits and skills and potential for the role and responsibilities of an effective and inspiring science or mathematics teacher.

Direction: Choose your best answer in each of the following questions.

Sample Item No. 1:

Teacher Ched would like to see to it that her class is well-managed. Which of the following three techniques can she do?

- I. Teachers praising their students, either privately or publicly, depending on the student's personality
- II. Telling the students that there's no room for mistakes in the classroom
- III. Reiterating rules every now and then
- IV. Ignoring misbehavior that can stop on its own

Choose your answer among the following:

A. I, II, III

C. III, IV, I

B. II, III, IV

D. IV, I, II

Correct Answer: C

Sample Item No. 2:

Which of the following teachers assesses students authentically?

- A. Mr. Mel who gives students real-life tasks to accomplish.
- B. Ms. Flora who gives valid and reliable paper-pencil test.
- C. Ms. Minerva who considers students' suggestions in testing.
- D. Mr. Mario who includes parents in the determination of assessment procedures.

Correct Answer: A



GOD BLESS!!! :)



SCIENCE EDUCATION INSTITUTE
Department of Science and Technology
Science Heritage Bldg., DOST Cmpd. Gen. Santos
Ave., Bicutan, Taguig City Tel. Nos. 837-1333,
839-0083 Fax No. 839-0086
www.sei.dost.gov.ph

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