20th GLORIOUS YEAR

SILVERZONE FOUNDATION
New Delhi, India

STEM
OLYMPIAD

Science | **Technology** | **Engineering** | **Mathematics**

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Geniuses are
~~born, not~~
made.

About

SilverZone STEM Innovation Olympiads (STEM) is a noble pursuit encouraging our bright youth to take part in a cause that is much bigger than themselves. A forward-thinking movement to achieve excellence in the field of Science, Technology, Engineering and Mathematics.

Structure of the Olympiad

The Olympiad is open for Classes from 3rd to Class 10th and will be conducted in two stages.

Stage 1: National Stage

In this stage the student will compete with their counterpart from their home country. They will qualify for Stage 2 only after scoring a cutoff marking of 75%.

Stage 2: Inernational Stage

In this stage the student will compete with all the students from other countries along with their home country. The top 100 winners scoring more than 75% in Stage 1 from every class of each country will be taking part in stage 2.

Test Paper

The language medium is English only. The examination is being conducted for all classes from 3rd to 10th with the following details.
For Classes 1-2: There will be 25 questions and the duration will be 40 Minutes.
For Classes 3-5: There will be 35 questions and the duration will be 40 Minutes.
For Classes 6-10: There will be 40 questions and the duration will be 50 Minutes.

The questions will be of objective type in nature with multiple choice answers. There is no negative marking.

Syllabus & Sample Questions

Science: Force, work & energy; The simple machines; Light: The fastest thing; Forces of nature: natural calamities; Imagine the unimaginable: Universe; Systems inside our body

Technology & Engineering: Information Technology – Computer Fundamental, Windows OS, Introduction to MS-Office, Internet and communication, Introduction and basics of Programming Language, Coding using 'Scratch' – Block based Programming Language (Advanced), Artificial Intelligence [Domains of AI], Intelligence assessment with Logical Reasoning

Mathematics: Number Sense and Numeration; Understanding Fractions; Ratio and Its Application; Geometrical shapes; Measuring Temperature; Handling Data

Science

1. A situation has been given below. The direction of frictional force, gravitational force and muscular force on the box is:
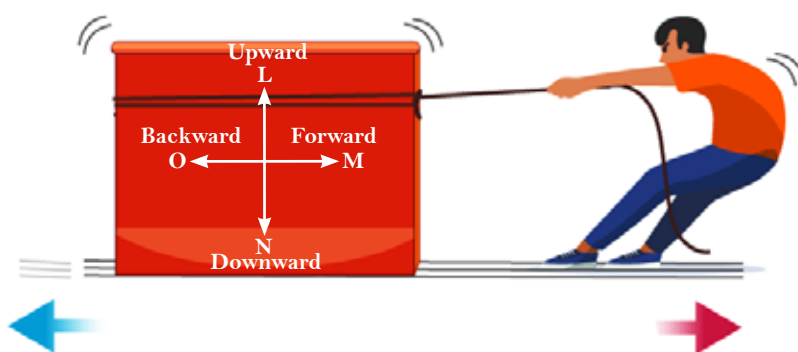
A. Towards M, towards N and towards O respectively

B. Towards L, towards N and towards O respectively

C. Towards O, towards N and towards M respectively

D. Towards L, towards M and towards N respectively

2 Orbit of revolution of planet X is between the orbits of the planets Jupiter and Saturn. Raj made four predictions about the planet as given in the options. Which of his prediction is most likely to be correct?

A. The planet X must have 20 moons.

B. The planet X must be the heaviest planet of our solar system.

C. Planet X takes more time to complete one revolution around the Sun than that of Earth.

D. The planet X must be smallest planet in the solar system.

3 A person kicks a ball and the ball moves along the wooden surface as shown below. The ball finally collides with a wall and stops there. Which option is correct with respect to the points P and Q shown in the path below?
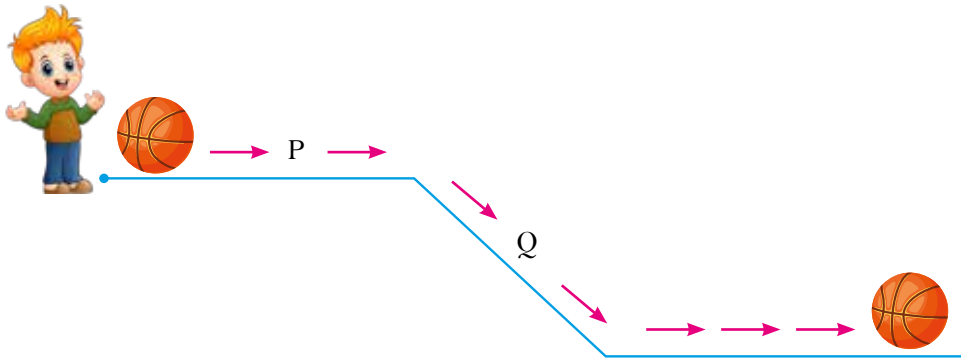
A. Kinetic energy of the ball at point P is more than that of point Q

B. Kinetic energy of the ball at point P is less than that of point Q

C. At both the points, kinetic energy of the ball remains equal

D. None of these

4 An small iron ball is taken to all the four points P, Q, R and S one by one around the magnet as shown below and strength of the force applied by the magnet is measured. Now find the points where magnetic force is maximum and minimum respectively.

A. At P maximum and at Q minimum   B. At Q maximum and at R minimum

C. At R maximum and at S minimum   D. At P maximum and at S minimum

Technology & Engineering
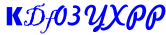
5 Given below is the information about different generations of computers. Match the two columns.

Column I	Column II
1. 2nd Generation	I. Based on Integrated circuit.
2. 3rd Generation	II. Based on Vacuum tube.
3. 4th Generation	III. Based on Artificial Intelligence.
4. 5rd Generation	IV. Based on Transistors.
	V. Based on Microprocessors.

A. $1\rightarrow$II, $2\rightarrow$IV, $3\rightarrow$I, $4\rightarrow$V

B. $1\rightarrow$IV, $2\rightarrow$III, $3\rightarrow$II, $4\rightarrow$I

C. $1\rightarrow$V, $2\rightarrow$IV, $3\rightarrow$III, $4\rightarrow$II

D. $1\rightarrow$IV, $2\rightarrow$I, $3\rightarrow$V, $4\rightarrow$III

6 Choose the following steps given below and find the correct sequence for creating an e-mail account.

I.	Enter your personal details like name, age, address and soon.	a.	Click **I accept** to agree to the Microsoft services agreement **I accept**
II.	Choose a desired login name that is unique.	b.	**Who are you?** Name First Last Birth date Day Month Year Gender Select one
III.	Enter the password. (Remember login name and password)	c.	**Help us make sure you're not a robot** Enter the characters you see New | Audio **KDf03YXPP**
IV.	Enter the verification code in the box, type the given set of characters in the picture.	d.	**How would you like to sign in?** Microsoft account name @outloock.com
V.	Agree to the 'Terms of Service' and 'Privacy Policy'.	e.	Create a password 8-character minimum case sensitive Reenter password

A.   I$\rightarrow$b, II$\rightarrow$d, III$\rightarrow$e, IV$\rightarrow$c, V$\rightarrow$a

B.   I$\rightarrow$b, II$\rightarrow$d, III$\rightarrow$e, IV$\rightarrow$a, V$\rightarrow$c

C.   I$\rightarrow$b, II$\rightarrow$d, III$\rightarrow$c, IV$\rightarrow$e, V$\rightarrow$a

D.   I$\rightarrow$b, II$\rightarrow$e, III$\rightarrow$d, IV$\rightarrow$c, V$\rightarrow$a

7 Match the following columns.

X *(Application)*	Y *(Domain of AI)*
I.	a. Natural Language Processing (NLP)
II.	b. Data
III.	c. Computer Vision

A. I→c, II→b, III→a
B. I→b, II→a, III→c
C. I→a, II→b, III→c
D. I→c, II→a, III→b

8 Match the following columns.

Column I	Column II
I. 𝔸 exhibits which symmetry?	a. Mirror symmetry
II. 𝕊 has which symmetry?	b. Centre of rotation
III. In case of rotational symmetry there is always a:	c. Translational symmetry
IV. ⇒⇒⇒⇒ exhibits:	d. Rotational symmetry

A. I→a, II→b, III→c, IV→d
B. I→b, II→d, III→c, IV→a
C. I→a, II→c, III→d, IV→b
D. I→a, II→d, III→b, IV→c

Mathematics

9 Consider the digit shown below:

3, 7, 0, 9, 1

Largest 5-digit numbers from 3, 7, 0, 9, 1

Smallest 5-digit numbers from 3, 7, 0, 9, 1

Jay   Veeru

Jay makes the largest five digit numbers from all these digits whereas Veeru makes the smallest five digit number from these digits.

What will be the difference of the numbers formed by both?

A. 7 8 6 2 1

B. 7 6 8 2 1

C. 8 6 3 9 1

D. 8 6 9 3 1

10 Vicky chooses three fractions A, B, C such that A > B > C. He notices that sum of these fractions equals to $3\frac{13}{24}$. If he divides the largest fraction by the smallest fraction then he gets result $6\frac{2}{3}$, which is 6 more than the middle fraction. Find the smallest fraction choosen by Vicky.
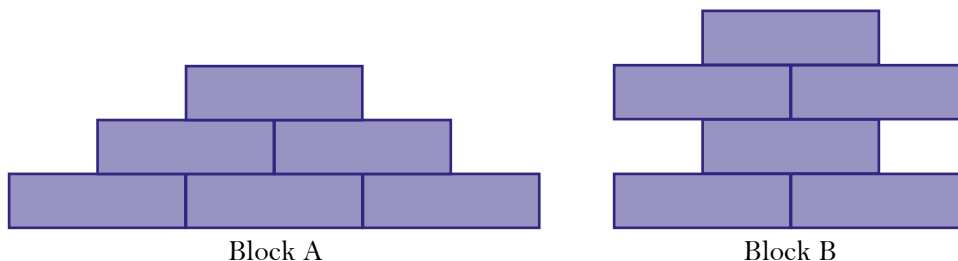
A. $\frac{2}{3}$

B. $\frac{3}{4}$

C. $\frac{8}{3}$

D. $\frac{3}{8}$

11 Ravi draws two blocks each having six identical rectangles. He measures the perimeter of both the blocks and he finds that the difference of their perimeters is 18 cm.

Block A   Block B

Based on this information identify the correct statement:

A. Perimeter of Block A is 63 cm

B. Perimeter of Block B is 72 cm

C. Sum of the perimeter of both the blocks is more than 126 cm

D. None of these

12 For a sport event, Vibhu bought some hockey balls, hockey sticks and helmets each of which weighs 160 gm, 600 gm and 900 gm respectively. Total weight of all the different items is given below:

Items	Total weight of items
	2.4kg
	12.0 kg
	3.6 kg

Total how many items he bought?

A.	35	B.	39
C.	42	D.	45

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