



International FSP Contests

**2024** QUESTION BOOKLET

**FSP**  
**Science**  
**Contest**



**GRADE 9 & 10**

**VIBRANT YOUNGSTERS**

Time Allowed : 90 Minutes





Maximum Marks : 90

## WRITTEN DIRECTIONS FOR THE CONTEST

- 1) Wait till the invigilator gives the all-clear before beginning the contest.
- 2) Examine your name, father's name, school name, address, and other details one last time on the bubble sheet and answer page.
- 3) Only record your responses on the bubble sheet. Choose the best response from the four alternatives provided, and only one option should be marked per question.
- 4) Fill in the circles on the bubble sheet with blue or black ink; lead pencils are not permitted.
- 5) It is completely forbidden to use any kind of assistance, including cell phones and technological devices.
- 6) Three points are awarded for each right response. Negative marking would occur. A single point would be subtracted for each wrong response.
- 7) No justification may be given for an unaccompanied candidate to leave the examination room, including to use the restroom.
- 8) No objects, including electrical devices, are allowed within the room.
- 9) The competition is divided into the following five categories:
  - A) Vibrant youngsters Grade 1 & 2
  - B) Vibrant youngsters Grade 3 & 4
  - C) Vibrant youngsters Grade 5 & 6
  - D) Vibrant youngsters Grade 7 & 8
  - E) Vibrant youngsters Grade 9 & 10 / 0-levels
- 10) The contest is only open to enrolled students.
- 11) No candidate may remove any provided materials, including answer books, from the hall, even if they are partially filled in or utilized.
- 12) Neither the examiner nor the invigilator may respond if a participant does not understand a word or phrase on the exam paper.
- 13) Please visit [www.fspcompetitions.org](http://www.fspcompetitions.org) to learn about future competitions or to offer insightful comments.
- 14) Vibrant youngsters FSP must receive reports of any academic misconduct or malpractice at [info@fspcompetitions.org](mailto:info@fspcompetitions.org).





**Q-1**

Which of the following is the correctly matched pair of an organ and muscles present in the organ?

-  **A** Intestine – striated and involuntary
-  **B** Upper arm – smooth muscle and fusiform in shape
-  **C** Heart – involuntary and unstriated smooth muscle
-  **D** Thigh – striated and voluntary





**Q-2**

Medicines that obtain micro-organisms to kill or stop the growth of bacteria causing microorganisms are called \_\_\_\_

-  **A** Antiseptics
-  **B** Antibodies
-  **C** Antibiotics
-  **D** All of the above

**Q-3**

500 mL of a 5 M sample is diluted to 1500 mL. What will be the molarity of the new solution formed?

-  **A** 1.59 M
-  **B** 1.66 M
-  **C** 0.017 M
-  **D** 1.5 M

## Q-4

A red tide is a condition characterized by an algal bloom in which the water is covered with a red pigment called \_\_\_\_\_.



Diatoms



Dinoflagellates



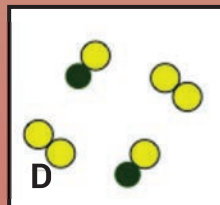
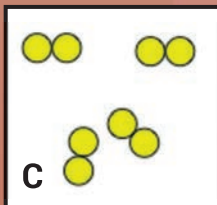
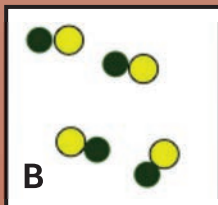
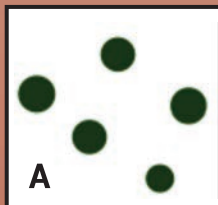
Euglena



Plankton

## Q-5

Four boxes shown, which one represents a model of elements only?



B and D



B and C



A, C and D



A and C

## Read the story and answer questions 6-9

Rohan, a curious student, noticed that his bicycle chain rusts quickly in the rainy season. He wonders what factors affect the rusting of the chain. He decides to investigate and gather some supplies: a few bicycle chains, water, salt, vinegar, and four plastic bags. He wants to design an experiment to answer his questions.

### Q-6

What can Rohan investigate to understand the rusting of his bicycle chain?



A How the color of the chain affects rusting



B How the length of the chain affects rusting



C How different liquids affect rusting



D How the shape of the chain affects rusting

### Q-7

Which liquid is most likely to cause rust on the bicycle chain?



A Distilled water



B Tap water



C Saltwater



D Vinegar

**Q-8**

What should Rohan use to prevent the chains from rusting?



Salt



Vinegar



Water



Oil

**Q-9**

Which experimental design would be best for Rohan's investigation?



Place one chain in each of the four bags with different liquids



Place all chains in one bag with a mixture of all liquids



Place two chains in each bag, one with salt and one with vinegar



Place one chain in water and observe for a month

**Q-10**

You arrive at a lake for a picnic and notice a sign that reads, "Warning: Algae bloom, do not swim or fish." What should you do?



Set up your picnic and enjoy the view, but avoid contact with the water.



Ignore the sign and go swimming.



Try fishing, but only in areas with no visible algae.



None of the above.

**Q-11**

When a given solution turns red litmus blue, it indicates?



The solution is alkaline



the solution is acidic



The solution is neither acidic nor basic



None of the above

**Q-12**

When you undertake a microscopic examination of bread mold, you see a dark structure at the tip. What are these structures called?



Hyphae



Mycelium



Rhizoid



Sporangium

**Q-13**

Five grams of each of the following gases are taken at  $87^{\circ}\text{C}$  and 750 mm pressure. Predict which of these gases will have the least volume.



HF



HCl



HBr



HI

**Q-14**

An aqueous solution of copper sulphate solution shows an acidic character, what does it mean?



It undergoes photolysis



It undergoes dialysis



It undergoes electrolysis



It undergoes hydrolysis

**Read the story and answer questions 15 to 18**

Raj, a graphic designer, is tasked with compressing high-resolution images for a website. He wants to reduce the file size without compromising image quality. Raj selects a test image and compresses it using different algorithms. He then compares the original and compressed images on his professional monitor.

**Q-15**

**Raj's test is likely to show -----**



That compressing images always improves their quality



That compressed images always have smaller file sizes



A tradeoff between image quality and file size







No relationship between compression and image quality







**Q-16**

By comparing the original and compressed images, Raj can determine----

-  A The best compression algorithm for website images
-  B The maximum file size for fast website loading
-  C The ideal balance between image quality and file size
-  D The minimum image quality for acceptable display





**Q-17**

If Raj finds that the compressed image is noticeably poorer in quality than the original, he may need to -----

-  A Use a different compression algorithm
-  B Adjust the compression settings
-  C Accept the reduced image quality for faster website loading
-  D Abandon image compression efforts

**Q-18**

Raj's test could show -----

-  A Whether image compression affects the image's color accuracy
-  B Whether the original and compressed images differ in sharpness
-  C How long it takes to download the compressed image
-  D None of the above

**Q-19**

After a serious accident, Maria underwent surgery to remove her left arm. During her recovery, she began experiencing strange sensations, as if her missing arm was still attached to her body. She described feeling as though her fingers were curled into a fist and that her arm was heavy, like it was weighed down by a heavy object.

**Which statement best summarizes Maria's experience after her surgery?**



Maria's arm was saved, but she had limited mobility in her fingers.



Maria experienced phantom sensations, feeling as though her missing arm was still present.



Maria's surgery resulted in nerve damage, causing numbness in her remaining arm.



Maria's accident caused brain damage, leading to hallucinations.

**Q-20**

The clownfish lives among the tentacles of the sea anemone, a poisonous creature that would be deadly to most other fish. But the clownfish has a special mucus on its skin that protects it from the anemone's sting. In return, the clownfish helps to keep the anemone clean and free of parasites, and also alerts the anemone to potential predators.

What type of relationship is formed between the clownfish and the sea anemone?



Commensal



Mutualistic



Parasitic



Predatory

**Q-21**

Kiran is heating a sample of ice in a laboratory setting, using a Bunsen burner. As the ice absorbs heat from the flame, it begins to melt and eventually reaches a temperature of  $0^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ ). If Kiran continues to apply heat to the sample, what will happen to the temperature of the sample during the melting process?



It will rise rapidly until the ice is completely melted.



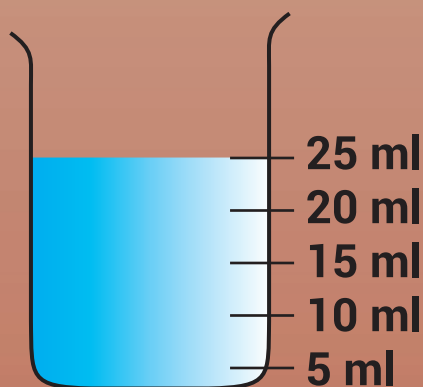
It will rise slowly and steadily as the ice melts.

It will remain constant at  $0^{\circ}\text{C}$  ( $32^{\circ}\text{F}$ ) until all the ice is melted.

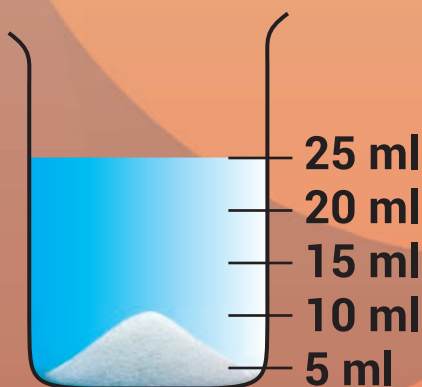
It will decrease as the ice absorbs more heat.

## Q-22

A student took 20 milliliters of water in a beaker and dissolved two teaspoonful of sugar in it. When he checked the volume, to his surprise, the volume remained same at 20 milliliters. Can you guess the reason?



Water



Water and Sugar



Sugar did not actually dissolve in the water.



Sugar evaporated.



Sugar occupied the empty spaces in between the molecules of water.



Sugar has zero volume.

## Q-23

Lucky left a cup of hot coffee on his table. He noticed something rising out of the surface of the coffee.



Which of the following describes correctly how the particles are arranged at P and Q?



Particles at P	Particles at Q
not so closely	far apart



Particles at P	Particles at Q
not so closely packed	closely packed



Particles at P	Particles at Q
far apart	closely packed



Particles at P	Particles at Q
far apart	not so closely

**Q-24**

If an object is placed at a distance of 0.5 m in front of a plane mirror, the distance between the object and the image formed by the mirror will be \_\_\_\_



2 m



1 m



0.5 m



0.25 m

**Q-25**

In the water cycle, what is the term for the process by which clouds merge and grow larger until they become too heavy to stay aloft, leading to the release of precipitation?



Condensation



Evaporation



Sublimation



Coalescence

Read the story and answer questions 26 to 30

The Atacama Desert in Chile is one of the driest places on Earth. The desert's unique ecosystem relies on fog collectors to harvest water from the air. A team of engineers has proposed three designs for a new fog collector system to supply water to the local community. The system must be able to collect water efficiently and withstand harsh weather conditions.

### Q-26

What is the main purpose of the fog collector system in the Atacama Desert?



To generate electricity



To collect water from the air



To reduce temperature



To create a greenhouse effect

### Q-27

Which sentence describes the location where the fog collector system will be installed?



The Atacama Desert is one of the driest places on Earth.



The desert's unique ecosystem relies on fog collectors to harvest water from the air.



The system must be able to collect water efficiently and withstand harsh weather conditions.



The Atacama Desert is located in Chile.

**Q-28**

What is a key consideration in designing the fog collector system?



Aesthetics



Cost



Efficiency



Durability

**Q-29**

Who has proposed the three designs for the fog collector system?



The local community



A team of engineers



The Chilean government



External consultants

**Q-30**

What is a unique challenge that the fog collector system must overcome in order to supply water to the local community?



High humidity levels



Limited space for installation



Harsh weather conditions



High demand for water



**EDUCATIONAL LEADERSHIP****AWARDS 2024*****FSP Mathematics  
Contest*****INTERNATIONAL FSP CONTESTS**

Inst Head Name	Job Title	Institution Name	City
Ms. Samreen Pathan	Principal	People's School	Mirpur Bathoro, District Sujawal
Mr. Shakeel Ahmad Buzdar	Principal	Army Public School & College Quaid Garrison	Dera Ghazi Khan
Ms. Quratulain Babar	Principal	Hira Foundation School	Karachi
Col. Qaisar Mustafa (Rtd)	Principal	Fauji Foundation School	Rawalpindi
Ms. Hira Hameed	Headmistress	S072- TCS Khairpur Campus	Khairpur
Dr. Uzma Shakir	Vice Principal	The Intellect School	Karachi
Lt. Col Syed Ibrahim (Rtd)	Principal	Fauji Foundation Education System Bagh (Ajk)	Bagh

# HIGH ACHIEVERS

# AWARDS 2024

## FSP Mathematics Contest

### INTERNATIONAL FSP CONTESTS

MRS. ASIMA REHMAN	FAUJI FOUNDATION COLLEGE	KALAR KAHAR
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MRS. GUL AMEN NISAR	FAUJI FOUNDATION SCHOOL	NAKIAL
MS. RUSHNA SHAKIL	THE CITY SCHOOL	JHELUM
MS. BASEERAT KAUSAR	FG PUBLIC MIDDLE SCHOOL	RAWALPINDI
MS. ASMA WASEEM	AISHA BAWANY ACADEMY	KARACHI
MRS. IRAM SHAHZADI	FAUJI FOUNDATION SCHOOL	TOBA TEK SINGH
MS. MADEEHA SHAH	FAUJI FOUNDATION SCHOOL	MARDAN
MS. KHADIJA AFZAL	HALIAMH SCHOOL OF EXCELLENCE	WAZIRABAD
MS. MUQADAS TAHIRA	HALIAMH SCHOOL OF EXCELLENCE	WAZIRABAD

MR. AAQIB ALI	PEOPLE'S SCHOOL	MIRPUR BATHORO, DISTRICT SUJAWAL
MS. ASMA BIBI	ARMY PUBLIC SCHOOL & COLLEGE QUAID GARRISON	DERA GHAZI KHAN
MS. RAMSHA YAWAR BAIG	HIRA FOUNDATION SCHOOL	KARACHI
MS. HINA SHAHID	FAUJI FOUNDATION SCHOOL	RAWALPINDI
MR. FAKHAR UDDIN	S072- TCS KHAIRPUR CAMPUS	KHAIRPUR
MS. SUMMAIYIA YAQOOB	THE INTELLECT SCHOOL	KARACHI
SYED AFLAKE HUSSAIN SHAH GARDEZI	FAUJI FOUNDATION EDUCATION SYSTEM BAGH (AJK)	BAGH
MS. ZAINAB SIAMWALA	THE ELIXIR SCHOOL	KARACHI
MS. HAJRA KIANI	ARMY PUBLIC SCHOOL AND COLLEGE, DHAI PH-1	ISLAMABAD
MS. ZOHA NIZAM	ARMY PUBLIC SCHOOL MARALA GARRISON	SIALKOT
MS. JAVERIA GHAFOOR	N003 - SATELLITE TOWN CAMPUS RAWALPINDI	RAWALPINDI
MS. FARIHA AMIR	BEACONHOUSE SCHOOL SYSTEM JAUHAR CAMPUS	KARACHI
MR. MUHAMMAD USMAN	BEACONHOUSE SCHOOL SYSTEM JAUHAR CAMPUS	KARACHI
MS. DURRE SHAHWAR	BEACONHOUSE SCHOOL SYSTEM JAUHAR CAMPUS	KARACHI
MR. MUHAMMAD ABRAR	BEACONHOUSE SCHOOL SYSTEM JAUHAR CAMPUS	KARACHI
MS. NADIA TASNEEM	UNIVERSITY CAMBRIDGE SCHOOL	FAISALABAD

# ANSWER SHEET

## GRADE 9 & 10

Q.NO ANSWER

- 1 (A) (B) (C) ●  
2 (A) (B) ● (D)  
3 (A) ● (C) (D)  
4 (A) ● (C) (D)  
5 (A) (B) (C) ●  
6 (A) (B) ● (D)  
7 (A) (B) ● (D)  
8 (A) (B) (C) ●  
9 ● (B) (C) (D)  
10 ● (B) (C) (D)  
11 ● (B) (C) (D)  
12 (A) (B) (C) ●  
13 (A) (B) (C) ●  
14 (A) (B) (C) ●  
15 (A) (B) ● (D)

Q.NO ANSWER

- 16 (A) (B) ● (D)  
17 (A) ● (C) (D)  
18 (A) ● (C) (D)  
19 (A) ● (C) (D)  
20 (A) ● (C) (D)  
21 (A) (B) ● (D)  
22 (A) (B) ● (D)  
23 (A) (B) (C) ●  
24 (A) ● (C) (D)  
25 (A) (B) (C) ●  
26 (A) ● (C) (D)  
27 (A) (B) (C) ●  
28 (A) (B) (C) ●  
29 (A) ● (C) (D)  
30 (A) (B) ● (D)



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 [www.fspcompetitions.org](http://www.fspcompetitions.org)

 [Info@fspcompetitions.org](mailto:Info@fspcompetitions.org)