



INTERNATIONAL CATS CONTESTS

COMPETENCE & APTITUDE TESTING SERVICES



GRADE 7 & 8 (JUVENILES)

Time Allowed: 90 Mins.

Maximum Marks: 90



ICATS
SCIENCE Contest 2018
QUESTION BOOKLET

ICATS SCIENCE CONTEST 2018

JUVENILES (GRADE 7 & 8)

TIME ALLOWED : 90 MINUTES, MAXIMUM MARKS : 90

TOTAL QUESTIONS : 30 MCQS

INSTRUCTIONS

1. DON'T START ATTEMPTING THE PAPER UNTIL INSTRUCTED BY THE INVIGILATORS.
2. INSTRUCTIONS FROM THE EXAMINATION INVIGILATOR MUST BE CARRIED OUT PROMPTLY.
3. CAREFULLY RECHECK YOUR NAME, FATHER NAME, SCHOOL NAME, ADDRESS ETC AT THE BUBBLE SHEET / ANSWER SHEET.
4. RECORD ALL ANSWERS ON THE BUBBLE SHEET ONLY. SELECT BEST ANSWER FROM THE FOUR GIVEN OPTIONS AND MARK ONLY ONE OPTION IN EACH QUESTION.
5. USE BLUE / BLACK INK TO FILL UP THE CIRCLES FOR YOUR ANSWERS ON THE BUBBLE SHEET. USE OF LEAD PENCIL IS NOT ALLOWED.
6. USE OF ANY HELPING MATERIAL INCLUDING CELL PHONES AND ELECTRONIC DEVICES IS STRICTLY PROHIBITED.
7. EVERY CORRECT ANSWER EARNS THREE POINTS. THERE WOULD BE NEGATIVE MARKING. ONE POINT WOULD BE DEDUCTED FOR EVERY INCORRECT ANSWER.
8. CANDIDATES MAY NOT LEAVE THE EXAMINATION ROOM UNESCORTED FOR ANY REASON, AND THIS INCLUDES USING THE WASHROOM.
9. NO MATERIALS OR ELECTRONIC DEVICES SHALL BE BROUGHT INTO THE ROOM.
10. THERE ARE FIVE CATEGORIES OF THE CONTEST AS UNDER:
 - A. TODDLERS (GRADE 1–2)
 - B. KIDS (GRADE 3–4)
 - C. JUNIORS (GRADE 5–6)
 - D. JUVENILES (GRADE 7–8)
 - E. ADOLESCENTS (GRADE 9–10 / O-LEVELS)
11. ONLY REGISTERED STUDENTS CAN PARTICIPATE IN THE CONTEST.
12. NO CANDIDATE SHALL TAKE OUT OF THE HALL ANY ANSWER BOOK(S) OR PART OF AN ANSWER BOOK, WHETHER USED OR UNUSED, OR OTHER SUPPLIED MATERIAL.
13. IF A PARTICIPANT DOES NOT UNDERSTAND A WORD OR PHRASE ON THE EXAM PAPER, NEITHER EXAMINER NOR INVIGILATOR IS PERMITTED TO ANSWER.
14. FOR INFORMATION ABOUT UPCOMING CONTESTS OR PROVIDING VALUABLE FEEDBACK, PLEASE VISIT WWW.CATSCONTESTS.ORG
15. ANY ACADEMIC MISCONDUCT OR MALPRACTICE MUST BE REPORTED TO INTERNATIONAL CATS CONTESTS AT INFO@CATSCONTESTS.ORG

Q1. Which tool should the students use to accurately measure the volume of each rock given below.

**A****B****C****D**

Q2. A nuclear power plant has recently been built to generate electricity for a town located near several small lakes. Which is not a benefit of this nuclear power plant being built?

A The cost of the electricity will decrease.

B The loss of habitat for local wildlife.

C The heating of homes will be easier.

D The nuclear power plant will provide jobs.

- Q3.** Different types of water pollution and their effects are described in the table below.

Descriptions of Water Pollution

Type	Effect
Raw Sewage	Illnesses such as typhoid and hepatitis can spread to humans
Phosphate and Nitrate	Increases algae, then decaying algae uses up oxygen in water
Poison	Stored in the bodies of fish and builds up in organisms that eat fish
Oil	Becomes stuck on bird feathers
Thermal (heat)	Causes water to be less able to contain oxygen; causes bacteria to grow

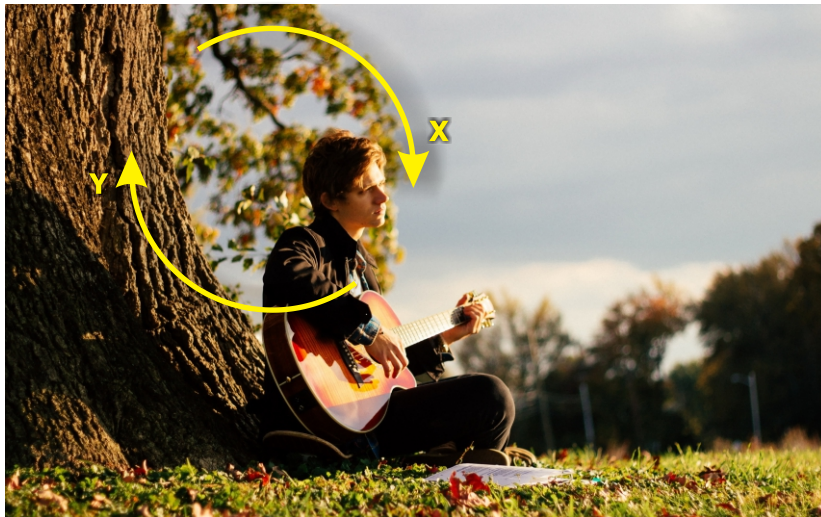
Based on the table, which of the followings results from both phosphate and nitrate pollution and thermal (heat) pollution in water?

- A** Diseases are carried through the water. **B** Materials contaminate the bodies of birds.
C Growth of algae rapidly increases. **D** Levels of oxygen in the water decrease.

- Q4.** A company is designing a dam with a floodgate to keep houses safe during the rainy season. The company is reviewing several possible designs that have worked in the past and is trying to develop a plan for implementing one design. Which is the next step in this process?

- A** pick several dams to use in a consumer survey
B test each dam model during a different flood season
C analyze the dam designs and pick one based on local needs
D redesign the past dams based on what the company feels will work best

Q5. The picture shows an exchange of gases between plants and animals.



What gas is most likely represented by the arrow labeled X?

- A** carbon dioxide **B** hydrogen **C** nitrogen **D** oxygen
-

Q6. Medical researchers are developing a wireless blood pressure monitoring system for use in hospitals. This system allows nurses to measure a patient's blood pressure without awakening the patient. Which is the intended benefit of this technology?

- A** Patients will not be disturbed.
B Patients will have to take fewer medications.
C Patients can experience pain relief.
D Patients can avoid having surgery.

- Q7.** The table given below shows the percentage of individuals in a population of insects that is resistant to certain types of insecticides.

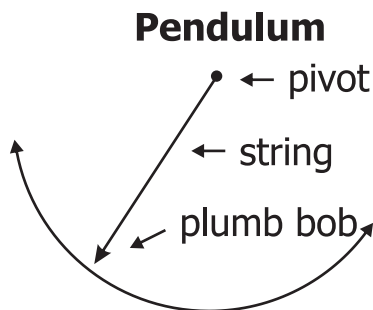
Insecticide Resistant Insect Populations

Population	Insecticide 1	Insecticide 2	Insecticide 3
1	12.8%	48.5%	1.8%
2	52.5%	2%	9.3%
3	28.6%	9.2%	34.8%
4	0%	0%	10.1%
5	2.8%	66.6%	3.5%
6	3.6%	78.5%	48.2%

Which two populations would be most affected by a widespread use of Insecticide 2?

- A** 2 and 4 **B** 1 and 6 **C** 3 and 5 **D** 4 and 6

- Q8.** In which way should the students manipulate the variables to get valid results in this investigation?



- A** use equal string lengths and different plumb bob masses
B use different string lengths and different plumb bob masses
C use equal string lengths and the same plumb bob shapes
D use different string lengths and different plumb bob shapes

- Q9.** A meteorologist recorded high temperatures for five days at three locations on land. The data are shown in the table below.

High Temperatures

Date	Temperature at the Beach (°C)	Temperature 25 km West of Beach (°C)	Temperature 50 km West of Beach (°C)
June 1	29.4	18.8	36.1
June 2	27.2	26.6	27.2
June 3	27.7	27.7	28.8
June 4	27.7	28.8	26.6
June 5	26.6	22.7	25.0

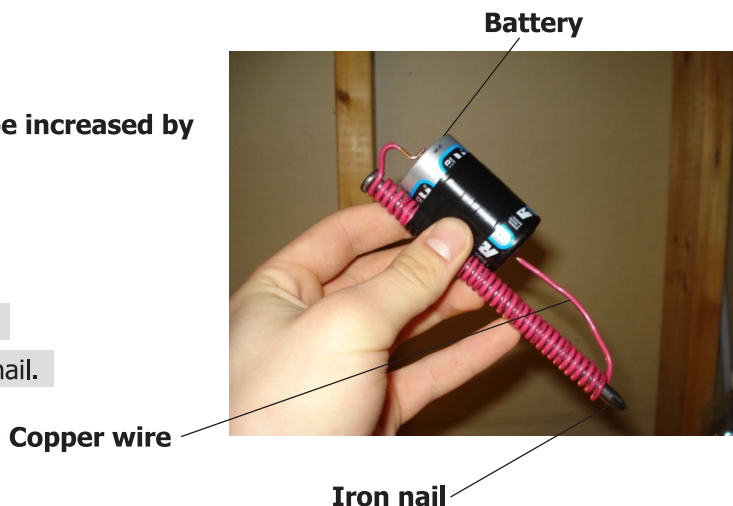
Which is the best conclusion based on these data?

- A** Areas at the beach have the coolest temperatures.
- B** Areas farther from the beach always have the warmest temperatures.
- C** Areas at the beach have the most stable temperatures.
- D** Areas farther from the beach always have the same weather as areas at the beach.

- Q10.** The parts of an electromagnet are shown below.

The strength of the magnet will be increased by

- A** using more nails.
- B** adding a switch.
- C** making more loops with the wire.
- D** placing the battery closer to the nail.



Q11. Some researchers are developing a new fertilizer designed to improve the growth of plants in hot, dry climates. The fertilizer was applied to one hundred desert plants in a greenhouse. The average daytime temperature in the greenhouse was 90°F, and the humidity levels were low. Which is best for the researchers to do next?

- A** compare plants that received fertilizer to similar plants that received none
- B** begin selling the fertilizer to gardeners living in hot, dry climates
- C** change the conditions in the greenhouse and retest the fertilizer
- D** test the fertilizer on plants that are adapted to cooler climates

Q12. The table below shows the average rainfall amounts and number of grazing animals in an area over a 30-year period.

Rainfall Data

	Millimeters of Rain	Number of Grazing Animals
1975	780	1500
1980	525	2000
1985	600	1500
1990	575	2500
1995	300	1500
2000	850	1000
2005	300	1500

Which is the best conclusion based on the data?

- A** The number of grazing animals increases approximately every 5 years.
- B** The number of grazing animals supported by rainfall cannot exceed 2000.
- C** The number of grazing animals is not affected by the amount of rainfall.
- D** The number of grazing animals increases after years of increased rainfall.

Q13. Four changes are shown below. Which of these represents a chemical change?

- A** A match is lit, creating a yellow-orange flame.
 - B** A small piece of ice melts, changing from a solid to a liquid.
 - C** A ball of clay sinks in water, and floats when reshaped.
 - D** A pot of water is heated to boiling, and evaporation occurs.
-

Q14. The procedure below is designed to test how water temperature affects the rate at which sugar dissolves.

- Measure 150 milliliters of water into each beaker.
- Heat water to three different temperatures.
- Put 5 grams of sugar into each of the beakers at the same time.
- Stir and record the time it takes for the sugar to completely dissolve.

Which additional step will most improve the investigation?

- A** Use 200 milliliters of water in each beaker.
- B** Record the initial and final temperatures of the water.
- C** Stir at different rates for each beaker.
- D** Record the times when sugar is half dissolved.

- Q15.** The table below shows researchers' data from an investigation designed to determine which sponge shape absorbs the greatest volume of water.

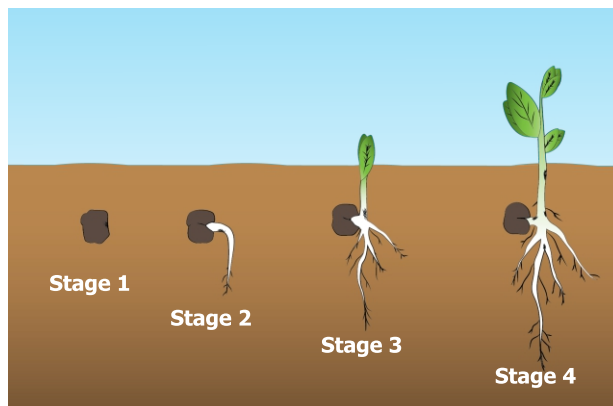
Based on the data, the researchers stated that the irregular-shaped sponge absorbed the greatest volume of water. Researchers plan to market the irregular-shaped sponge as "super absorbent." What is wrong with the researchers' interpretation of the data?

Sponge Table

Sponge Shape	Mass of Wet Sponge
Round	5.50 grams
Square	5.70 grams
Irregular	6.00 grams
Oval	5.53 grams

- A** The researchers should have tested the sponges in different types of liquids.
- B** The researchers should have tested more types of sponges.
- C** The researchers did not record the dry mass or volume of each sponge.
- D** The researchers did not freeze each sponge before massing it.

- Q16.** The diagram below shows the stages of development of a plant.



At which stage has germination begun?

- A** 1 **B** 2 **C** 3 **D** 4

Q17. The table provides information about different worms.

Worm Characteristics

Type of Worm	Segmented	Bilateral Symmetry	Sexual Reproduction	Body Cavity	Example
Segmented worms	Yes	Yes	Yes	Yes	Earthworms and leeches
Flatworms	No	Yes	Yes	No	Planaria and tapeworms
Roundworms	No	Yes	Yes	Modified	Hookworms and Ascaris

Which is an example of a nonsegmented worm with no body cavity?

A Earthworms

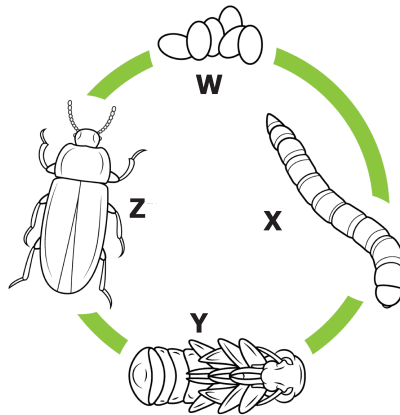
B leeches

C Ascaris

D tapeworms

Q18. The diagram below shows the life cycle of a mealworm. The stages in its life cycle are labeled W, X, Y, and Z.

Which stage is shown at Y?



A adult

B egg

C larva

D pupa

Q19. Which statement best describes wood and coal in terms of renewability and formation time?

- A** Wood is nonrenewable and forms in a few years, unlike coal, which is renewable and takes millions of years to form.
 - B** Wood is renewable and forms in a few years, unlike coal, which is nonrenewable and takes millions of years to form.
 - C** Wood is nonrenewable and takes millions of years to form, unlike coal, which is renewable and forms in a few years.
 - D** Wood is renewable and takes millions of years to form, unlike coal, which is nonrenewable and forms in a few years.
-

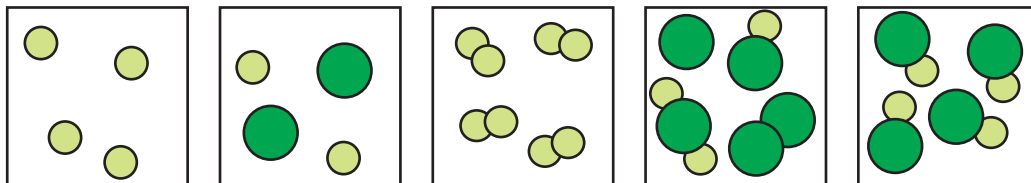
Q20. A student observes that a gas is formed when chemical Y is added to chemical Z in the lab. The student's observation of a new product being formed is the common outcome of all

- A** physical changes.
 - B** chemical changes.
 - C** mass changes.
 - D** phase changes.
-

Q21. Which of the following is a way that people directly affect the environment?

- A** playing soccer
- B** dumping trash
- C** attending a concert
- D** going to school

Q22. Five diagrams of atomic arrangements are shown below.

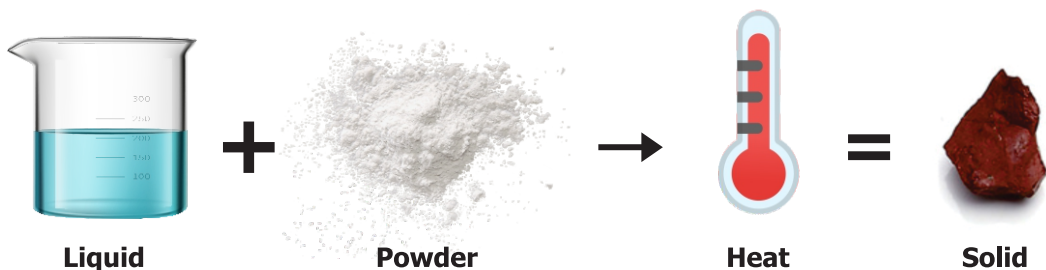


Which of these best describes all five diagrams?

- A** All are compounds made of atoms. **B** All have three types of atoms.
C All are composed of atoms. **D** All have the same atomic symbol.

Q23. A student performed a classroom investigation by mixing a purple liquid and a white powder.

Diagrams of the setup and the resulting blue solid are shown below.



The student could best classify this reaction as a

- A** physical change. **B** weight change. **C** mass change. **D** chemical change.

Q24. Plastic waste is a major type of pollution. There are many types of plastic. The use of waste plastic in road surfaces is being investigated. Two things are done to the waste plastics before they can be used as part of a road surface:

1. the plastics are sorted and the required type of plastic selected
2. the selected plastic is cut into tiny pieces.

Once the waste plastic has been sorted and cut into pieces, it is melted. The melted plastic can then be moulded into any shape needed. The plastic to be used in the road surface has been tested over a temperature range of $-40\text{ }^{\circ}\text{C}$ to $+80\text{ }^{\circ}\text{C}$. Why was this range of temperature used to test the plastic?

- A** The range would cover most weather conditions.
 - B** $-40\text{ }^{\circ}\text{C}$ is the coldest temperature possible.
 - C** The range contains simple numbers, so calculations based on them are easier to carry out.
 - D** The range does not need to exceed $+80\text{ }^{\circ}\text{C}$ as all solids turn to liquid at this temperature.
-

Q25. In scientific studies the results of a test can be positive or negative.

- A positive test shows that something is present.
- A negative test shows that something is absent.

However, mistakes can be made in tests that affect the result.

- A false positive is one where the result of the test is positive, but it really should be negative.
- A false negative is one where the result of the test is negative, but it really should be positive.

In 2007 a plastic bath toy was found on a beach in Devon in the UK. Some people claimed this was one of the toys that had been lost in the North Pacific Ocean. However, it was soon discovered that the toy was not from the cargo lost in that ocean.

How would the finding of the toy on the beach in Devon be best classified?

- A** positive
- B** negative
- C** false negative
- D** false positive

Q26. In 2006 nearly 30,000 plastic bath toys fell from a ship in the North Pacific Ocean. The toys were contained in plastic pack, with a cardboard backing. After a few hours the cardboard separated from the pack. This left the toys floating in the ocean.

Note: The black cardboard is glued to the edge of the plastic covering the duck.



← cardboard backing

← edge of plastic glued to cardboard

← plastic covering the bath toy

Eventually some of the plastic toys filled with water. However, even when full of water they floated on the surface of the sea.

What does this observation tell us about this plastic?

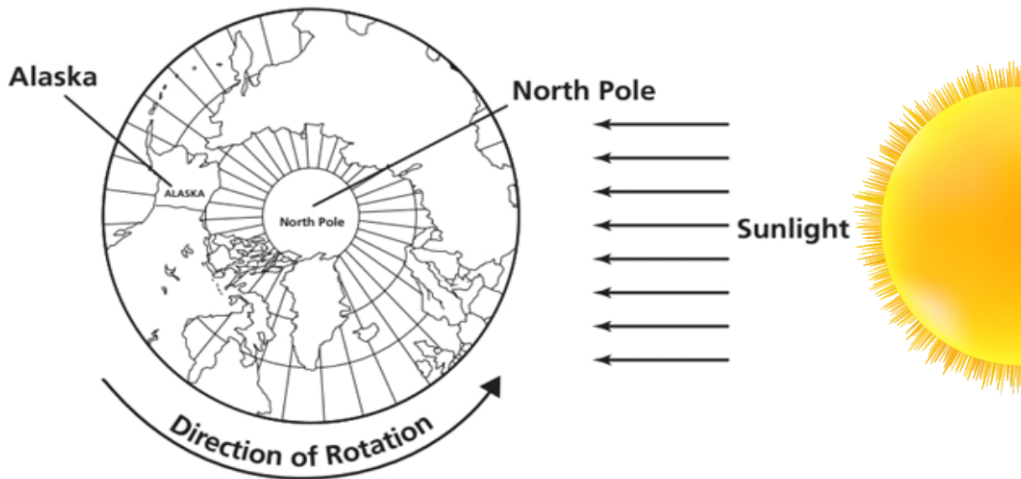
- A** The plastic must contain air bubbles.
- B** The plastic was not a natural material.
- C** The plastic has a lower density than sea water.
- D** The plastic contains chemicals that react in sea water.

Q27. Blue crabs can be found in the coastal waters of New Jersey. Which of these explains why the crab's outer shell helps it survive in its habitat?

- A** The shell keeps the crab warm.
- B** The shell helps the crab catch food.
- C** The shell protects the crab from predators.
- D** The shell allows the crab to get oxygen.



Q28. The picture below shows a satellite view of Earth from directly above the North Pole during the summer. What time of day would it be in Alaska?



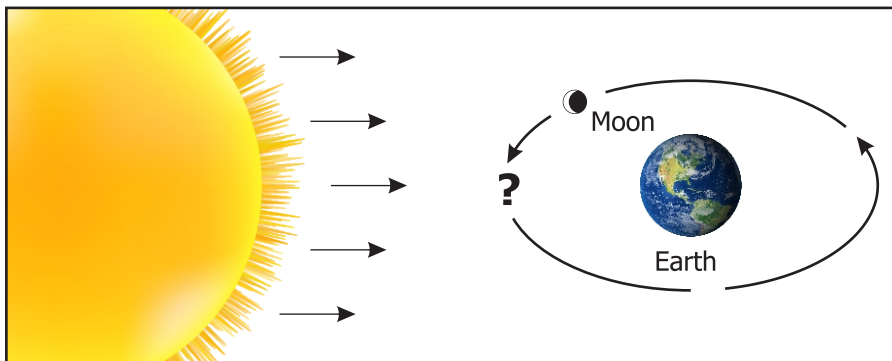
A midday

B night

C sunset

D sunrise

Q29. The diagram shows a waning crescent moon.



Which moon phase will happen next?

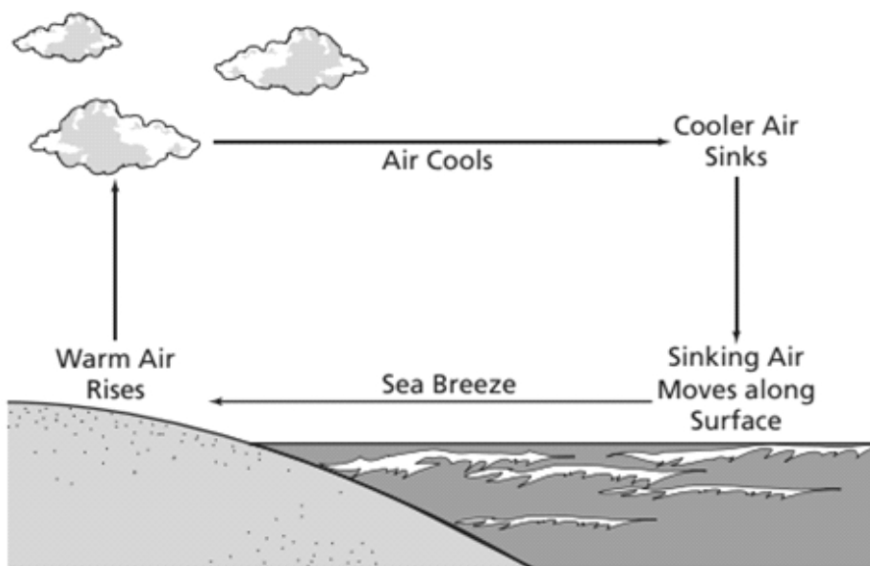
A new moon

B waning gibbous

C full moon

D last quarter

Q30. The drawing below shows a sea breeze.



When is this type of wind pattern most likely to occur?

- A** during the day when the land heats faster than the surface of the sea
- B** during the night when the surface of the sea cools faster than the land
- C** during the day when the sea is as warm as the land
- D** during the night when the air above land is warmer than the air above the sea

ICATS English Linguistics Contest 2018 National Toppers

Student Name	Father Name	Grade	School	City
FIMAAN TASSADDUQUE	ROSHAAN TASSADDUQUE	1	KOHINOOR GRAMMAR SCHOOL	FAISALABAD
MUSA NOOR	NOOR NABI	1	FOUNDATION MONTESSORI SCHOOL	BAHAWALPUR
ZAINA KHAN	MUNAWAR AHMED	1	BEACONHOUSE SCHOOL SYSTEM (BKI F-7/4)	ISLAMABAD
MALIK-AL-ASHTER	KHAN MURTAZA	2	MSB INSTITUTE-SHABBIRABAD	KARACHI
JAWAD ALI	MUHAMMAD ASSAD	2	JOINT STAFF PUBLIC SCHOOL AND COLLEGE CHAKLALA	RAWALPINDI
M. ASAD HUSSAIN	SYED M. ASIF HUSSAIN	2	USMAN PUBLIC SCHOOL SYSTEM (CAMPUS XVI)	KARACHI
HIJAB FATIMA	IRFAN QADIR	3	BEACONHOUSE ALLAMA IQBAL TOWN CAMPUS	LAHORE
ZAINEB NADEEM	NADEEM AFZAL	4	KOHSAR CHILDREN'S ACADEMY	MANSEHRA
MARIA FAISAL	FAISAL SALEEM	5	THE CITY SCHOOL GIRLS BRANCH SATELLITE TOWN	RAWALPINDI
IBRAHIM SALMAN	SALMAN RASOOL	6	LAHORE GRAMMAR SCHOOL FAISAL TOWN BRANCH	LAHORE
KHADIJA IMRAN	IMRAN MAGRANI	7	D. A PUBLIC SCHOOL (O/A LEVELS) SEAVIEW	KARACHI
LAIBA MASOOD	MASOOD ABBAS	8	USMAN PUBLIC SCHOOL SYSTEM (CAMPUS 1)	KARACHI
EMAAN IFTIKHAR	IFTIKHAR AHMAD	9	BEACONHOUSE SCHOOL SYSTEM PTC GIRLS BRANCH	GUJRANWALA
AYESHA NADEEM	MUHAMMAD NADEEM	10	USMAN PUBLIC SCHOOL SYSTEM (CAMPUS VIII)	KARACHI

ICATS Mathematics Contest 2018 National Toppers

Student Name	Father Name	Grade	School	City
AMAN ALI AHMAD	MUHAMMAD WASIM	1	LAHORE GRAMMAR SCHOOL (LANDMARK PROJECT)	LAHORE
MIAN AZAAN MAQBOOL	DANISH MAQBOOL	2	ARMY PUBLIC SCHOOL GARRISON JUNIOR	LAHORE
SHAHEER AFZAL	JAVED AFZAL MARWAT	3	ARMY PUBLIC SCHOOL (TODDLERS ACADEMY)	PESHAWAR
MUHAMMAD AHMED	ASMAT ALI	4	ARMY BURN HALL SCHOOL AND COLLEGE (FOR GIRLS)	ABBOTTABAD
M. MURTAZA ZAIDI	BABER ALI	5	BEACONHOUSE ALLAMA IQBAL TOWN CAMPUS	LAHORE
RAJA SAAD ALI	RAJA AAMIR	6	HITEC SCHOOL & COLLEGE FOR BOYS CANTT	TAXILA
ZAID BIN HAROON	M. HAROON RAFIQUE	7	THE SCIENCE SCHOOL	RAWALPINDI
WALEED AHMED	M. ATIQ	8	KIPS SENIOR BOYS CAMPUS JOHAR TOWN	LAHORE
M. RAYAN ABID	M. ABID MUNEEER	9	SIR SYED SCHOOL AND COLLEGE (CAMPUS IV)	WAH CANTT
IMTIAZ KHAN	DADA KHAN	10	AGA KHAN HIGHER SECONDARY SCHOOL	GILGIT

Compete
if you are the best