SCIENCE OLYMPIAD FOUNDATION

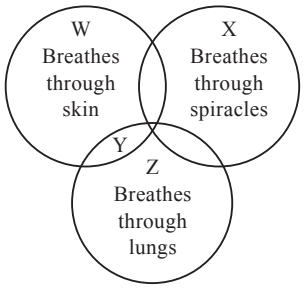
NSO

LEVEL - 2

Year 2015-16

1. Select the pair in which the given animals do not have the same type of respiratory organs.
   A. Butterfly, Mosquito B. Cockroach, Housefly
   C. Grasshopper, Frog D. Frog, Snake

2. Refer to the given Venn diagram.



   Which of the following is true for W, X, Y and Z?
   A. Organism W can be an earthworm or a snake.
   B. Organism X has a network of tubules called tracheae.
   C. Organism Y could be a frog or lungfish.
   D. Organism Z could be a dolphin or a scoliodon.

3. Refer to the given conversation among three friends.

   Sujata: Organism X completes its migration in several generations.

   Ruchi: Organism Y completes its migration in one generation but dies after reproducing.

   Priyanka: Organism Z migrates multiple times during its lifetime.

   Now, select the option that correctly identifies any two of these organisms.
   A. X - Salmon, Y - Monarch Butterfly
   B. Y - Arctic tern, Z - Polar bear
   C. X - Polar bear, Z - Monarch butterfly
   D. Y - Salmon, Z - Arctic tern

4. Which of the following animals' breathing organ is not hidden in the given word grid?

B	N	A	S	T
L	U	N	G	S
O	S	K	I	N
W	P	C	L	P
H	I	L	P	V
O	R	E	S	W

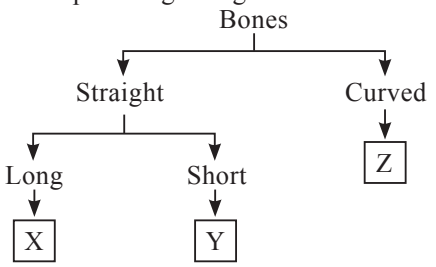
   A. Dolphin
   B. Earthworm
   C. Tadpole
   D. Siberian crane

5. Study the given table and select the incorrect option regarding P, Q, R and S.

Animals	P	Fish	R	S
Body Coverings	shell	Q	fur	feathers

   A. Animal P is mostly found in moist or aquatic habitat.
   B. Body covering Q is also found in snake and crocodile.
   C. Animal R is generally found in polar regions.
   D. Animal S has heavy and solid bones and hindlimbs modified into wings.

6. Study the given classification chart and select the incorrect option regarding it.



   A. A type of Z bones protect the heart, lungs, stomach and intestine.
   B. Examples of Y bones are bones of our fingers and toes.
   C. X kind of bones include the thigh bone.
   D. Skull bones are Z kind of bones.

7. Communicable diseases pass from one person to another through different modes of transmission. Which disease cannot spread through the mode of transmission as shown in the given figure?
   A. Common cold
   B. Mumps
   C. Cholera
   D. Influenza

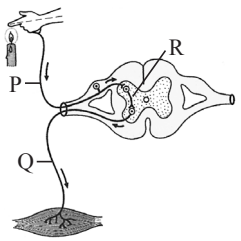
8. Study the given table and select the correct option regarding P, Q, R and S.

Joints	**Characteristics**	**Example**
Hinge joint	P	• Elbow joint • Knee joint
Q	Allows movements in all directions	• Hip joint • R
S	Allows rotation	• Joint between first two vertebrae

   A. P - Allows movement in one plane
      Q - Ball and socket joint
      R - Shoulder joint
      S - Pivot joint
   B. P - Allows backward and forward movement
      Q - Gliding joint
      R - Wrist joint
      S - Pivot joint
   C. P - Allows movement in all directions
      Q - Ball and socket joint
      R - Joints in toes
      S - Gliding joint

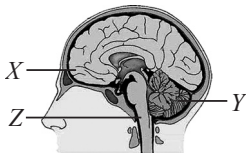
D. P - Does not allow any movement
Q - Pivot joint
R - Shoulder joint
S - Gliding joint

9. Observe the given diagram carefully which shows a reflex arc. What will happen if the orientation of neuron Q is made as of neuron P?



A. All voluntary movements of body including reaction to heat will stop.
B. The sensory receptor will not get stimulus from the candle.
C. The motor organ will not be able to get instructions from the spinal cord.
D. None of these

10. Refer to the given figure of brain with its parts labelled as X, Y and Z.



Which of the following holds true for X, Y and Z?
A. Y helps us to balance our body and keep us in an upright posture.
B. X helps us in learning our lessons and recalling the learnt concepts.
C. Z controls the involuntary actions of our body.
D. All of these

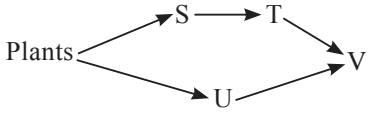
11. Four children made following statements :
Siddhi : We have movable lower jaw that enables us to eat and talk.
Manya : The long bones of our skeleton are filled with cerebrospinal fluid.
Advika : Cardiac muscles are involuntary in function but resemble voluntary muscles in structure.
Aradhika : A motor nerve called the optic nerve connects the eye to the brain.
Which children made correct statements?
A. Siddhi and Advika only
B. Siddhi and Manya only
C. Manya and Aradhika only
D. Advika and Aradhika only

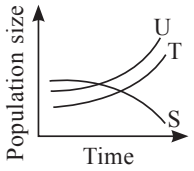
12. Study the given table carefully and identify the plants U, V, W and X.

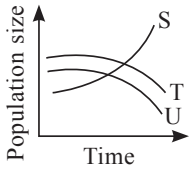
Plant	Mode of seed dispersal
U	Dispersal by water
V	Dispersal by animals
W	Dispersal by splitting of fruit
X	Dispersal by wind

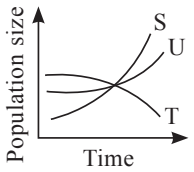
A. U - Madar, V - Coconut
B. W - Dandelion, X - Cotton
C. U - Lotus, V - *Xanthium*
D. W - Pea, X - Coconut

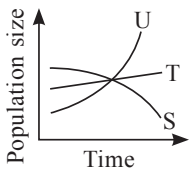
13. Study the given food web. Which of the following graphs shows how populations of S, T and U are likely to be affected if the population of V is increased?



A.


B.


C.


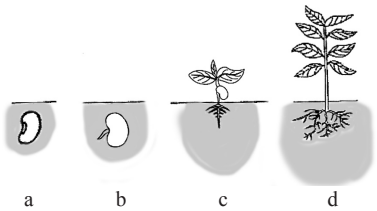
D.


14. Which of these differences between insect-pollinated flowers and wind-pollinated flowers is incorrect?

	Insect-pollinated flowers	Wind-pollinated flowers
A.	Pollen grains are heavier and sticky.	Pollen grains are light, small and dry.
B.	Petals are dull-coloured.	Petals are usually bright and colourful.
C.	Stigmas are small, enclosed between petals.	Stigmas are usually large, hairy or feathery.
D.	Flowers have a peculiar odour and generally produce nectar.	Flowers are generally odourless and nectarless.

15. Advika found three fruits X, Y and Z. Fruit X was very light and had wings. Fruit Y was spiny and fruit Z had a thick fibrous coat.
Which of the following holds true for X, Y and Z?
A. Mode of seed dispersal of fruit X is similar to that of lotus.
B. Both fruits, Y and Z can be dispersed by the same agency.
C. Seeds of guava and seeds of fruit Y both are dispersed by animals.
D. Mode of seed dispersal of fruit Z is similar to that of balsam.

16. The picture below shows how a plant grows.



Which of the following can be inferred from the given picture?

A. A seed has life.
B. A seed needs air, water and food to grow.
C. A seed cannot grow on its own.
D. A seed does not need air and water to grow.

17. Study the description given below.

Plants X and Y have waterproof leaves and float on water; plant X has swollen leaf stalks but plant Y does not.

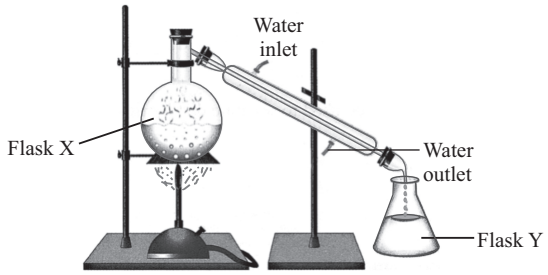
Which of the following pairs of plants can 'X' and 'Y' be?

	X	Y
A.	Water lily	Water lettuce
B.	Water lily	Water hyacinth
C.	Water hyacinth	Water lettuce
D.	Water moss fern	Water lily

18. Four burning sticks are placed into different containers P, Q, R and S containing oxygen, carbon dioxide, nitrogen and air respectively. The observations are then noted down. Which of these observations is correct?

	Container	Observation
A.	P	The glowing stick is extinguished immediately.
B.	Q	The glowing stick bursts into flame.
C.	R	The glowing stick bursts into flame.
D.	S	The glowing stick continues to glow for a while.

19. Select the incorrect option regarding the process shown in the given figure.



A. The amount of water will gradually decrease in flask X.
B. The amount of water will gradually increase in flask Y.
C. There will be no decrease in the quantity of water in the whole process.
D. None of these

20. Raman took four similar pots (with a hole at the base) each with equal amount of different type of soil. He then placed these four pots on four similar dishes and poured water slowly on each soil sample. He used a stopwatch to measure the time taken by water to reach the level, he had marked at the same height in each dish.

The results obtained by him were tabulated in the table shown here.

Type of soil	W	X	Y	Z
Time (in seconds) taken by water	48	65	35	110

Which soil is the most suitable for a plant that thrives in sandy soil ?

A. W B. X
C. Y D. Z

21. The rate of evaporation from the pond is dependent on _____.

1. Size of the pond
2. Humidity in the air
3. Strength of the wind
4. Temperature of the surrounding air

A. 1 and 2 only B. 2 and 3 only
C. 1, 2 and 3 only D. 1, 2, 3 and 4

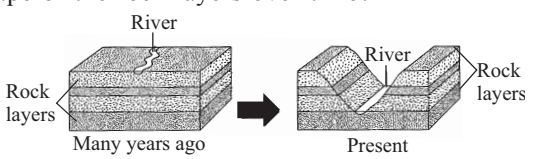
22. A fixed volume of water will dissolve a certain amount of salt. If the same volume of water is then heated, more salt can be made to dissolve in it. The best explanation to this is _____.

A. Heating increases the spaces between the water molecules
B. Heating reduces the size of the salt particles
C. Salt melts in hot water
D. Both water and salt particles become smaller when heated

23. Which of the following statements is correct about rocks and minerals?

A. Chalk is a form of limestone.
B. Most sedimentary rocks were once either metamorphic or igneous.
C. Gneiss is formed from pumice and has light and dark bands.
D. Coal and petroleum are precious metallic minerals.

24. The given figure shows an area of land that has changed over a period of time. Which process changed the shape of the rock layers over time?



A. The process involved in the formation of dew drops.
B. The process involved in the loss of top soil layer.
C. The process involved in the drying of wet clothes.
D. The process involved in the conversion of light energy into chemical energy.

25. Which of the following damages are associated with acid rain?

(i) Erosion of stone statues and buildings
(ii) Melting of ice caps
(iii) Increase in the number of mosquitoes
(iv) Threat to the life of aquatic beings
(v) Loss of soil fertility.

A. (i), (ii) and (iii) only
B. (i), (iv) and (v) only
C. (i) and (iii) only
D. (ii), (iii) and (v) only

26. Which of the following would possibly result due to increasing rate of deforestation?

(i) Process of top soil erosion may speed up.
(ii) Some animals may become extinct.
(iii) The problem of global warming may intensify.
(iv) A possible source of natural drugs to cure diseases may be lost.

A. (i) and (ii) only
B. (iii) and (iv) only
C. (i), (ii) and (iii) only
D. (i), (ii), (iii) and (iv)

27. If young crescent Moon is observed on the night of 11th January 20XX, then what is expected to appear on the night of 26th January?

A. Old Crescent Moon
B. Young Gibbous
C. Old Gibbous
D. Full Moon

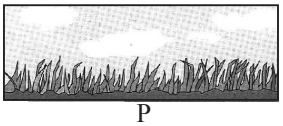
28. Read the given paragraph.

The American spacecraft Apollo - 7 carrying three passengers *viz*. Neil Armstrong, Edwin Aldrin and Yuri Gagarin landed on Moon on 21st July, 1979. This was a remarkable day in the history of mankind. They left a flag of NASA there which was specially designed to stay taut on the Moon, where there is no air.

There are some errors in the given paragraph. Select the option that correctly identifies their number.

A. 2 B. 3
C. 4 D. 5

29. A forest catches fire and burns completely. Which of the following communities will appear first?

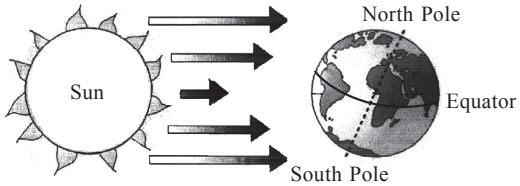

P


Q


R

A. P B. Q
C. R D. P or Q.

30. The Earth's axis is tilted with respect to its orbital plane as shown in the figure. This means that if on day 1, one pole is directed away from the Sun then after around 182 days the same pole will be directed towards the Sun.



Day 1

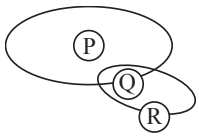
Which of the following two conclusions can be drawn from the above given passage and figure about days at North and South poles in the first and second half of the year respectively?

	First half of year	**Second half of year**
A.	24 hours of daylight at South pole	Complete darkness at North pole
B.	Complete darkness at North pole	Complete darkness at South pole
C.	24 hours of daylight at North pole	Complete darkness at South pole
D.	Both A and B	

31. Venus is the hottest planet of the Solar system even though Mercury is the closest planet to the Sun. The best explanation to this is _____.

A. Venus has an atmosphere rich in carbon dioxide which is a greenhouse gas.
B. Venus has no atmosphere to regulate the temperature.
C. Venus has the lowest tilt of all other planets.
D. Atmospheric pressure on Venus is very high as compared to other planets of solar system.

32. Select the correct option regarding the given figure, if alphabet 'P' represents the star at the centre of our solar system.



A. If Q is Mars then the number of R around it will be 2.
B. If Q is Venus then the number of R around it will be 3.
C. If Q is Jupiter, then the number of R around it will be 58.
D. If Q is Neptune, then the number of R around it will be 0.

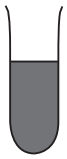
33. Select the correct comparison among the following.

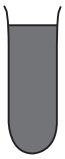
	Inner planets	**Outer planets**
A.	All of them have moons	Not all of them have moons
B.	Made of gases	Made of rocks
C.	Mercury, Venus, Earth and Mars	Jupiter, Saturn, Uranus and Neptune
D.	Have no solid surfaces	Have solid surfaces

34. Which one of the following will produce the sound with the lowest pitch, when you blow across the mouth of the test tube?

A. 

B. 

C. 

D. 

35. Select the odd one out among the following agricultural practices on the basis of their frequency during a crop cycle.

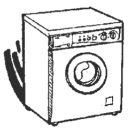
A. Irrigation B. Harvesting
C. Weeding D. Manuring

36. Kavita wanted to toast some bread with the electric toaster. When she switched on the toaster, she received a mild electric shock. However, when her sister Komal tried the same, she did not feel any shock. What could be the possible reason for the difference in their experiences?

(i) Kavita's hands were wet but Komal's hands were dry.
(ii) Kavita was barefoot but Komal was wearing a pair of rubber slippers.
(iii) Kavita's body was a better conductor of electricity than Komal's.

A. (i) and (ii) only
B. (i) and (iii) only
C. (ii) and (iii) only
D. (i), (ii) and (iii)

37. Which of the following appliances work by converting electrical energy into heat energy and are used to keep our surroundings warm?


P

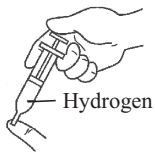

Q


R


S

A. P and Q only B. Q only
C. P, Q, R and S D. S only

38. Four identical syringes were filled with different substances as shown. In which syringe will the plunger not move at all when pushed in?

A. 

B. 

C. 

D. 

39. Vaibhav had four magnets of different shapes. He brought the north pole of each magnet near a pile of 40 pins. His observations were recorded in the table below.

Magnet	Distance between the magnet and the pins	Number of pins attracted
U-shaped magnet	6 cm	8
Bar magnet	2 cm	9
Ring magnet	4 cm	5
Rod magnet	2 cm	7

Based on the data given in the table above, which of the magnets has most likely the strongest pull?

A. U-shaped magnet
B. Bar magnet
C. Ring magnet
D. Rod magnet

40. Three persons P, Q and R suffering with different diseases were put in separate rooms, each with four healthy people under similar conditions. After a few days, it was observed that only the people sharing the room with Q fell ill. Select the option that most correctly identifies the diseases of persons P, Q and R.

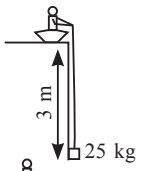
	P	Q	R
A.	Cholera	Cancer	Flu
B.	Flu	Anaemia	Rickets
C.	Anaemia	Flu	Asthma
D.	Asthma	Rickets	Conjunctivitis

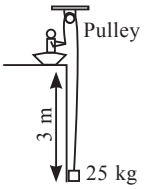
41. Anil and Brij are hammering a nail into two pieces of wood to join them. Sunita covered her ears, because she said that hammering is noisy. She told them that they are wasting energy because most of the energy they used in hammering is getting lost. Anil disagreed with what Sunita said. Brij explained that some of the energy is converted to sound and heat, but not lost. Anil then added that energy can never be lost or destroyed.

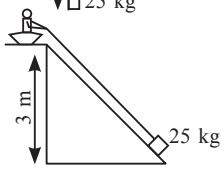
Who among Anil, Brij and Sunita is/are right?

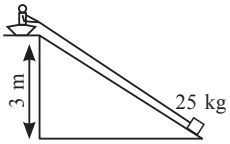
A. Brij only
B. Anil only
C. Sunita only
D. Anil and Brij only

42. Bhavika tries lifting the same object weighing 25 kg in different ways as shown here. She is standing on a 3 m tall platform. Which of these ways would require the least effort?

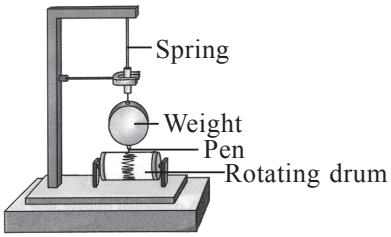
A. 

B. 

C. 

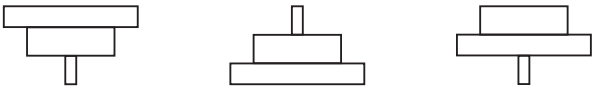
D. 

43. The instrument shown in the figure is used for recording a natural phenomenon which is caused by _____.



A. Building of low pressure area over sea
B. Excessive rainfall
C. Collision of Earth's underground plates
D. None of these

44. Select the correct match of the following food chains (i) and (ii) with the pyramids d, e and f shown here.
(i) Grass → Goat → Lion
(ii) Lime tree → Caterpillars → Mynas

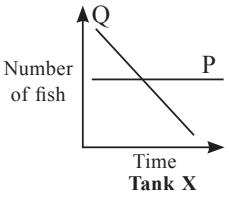


A. (i) - d, (ii) - e
B. (i) - d, (ii) - f
C. (i) - e, (ii) - f
D. (i) - f, (ii) - d

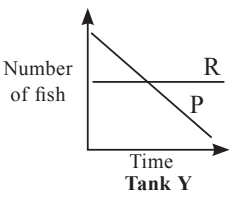
45. Which of the following changes is different from the other three?
A. Opening of the lid of a bottle jar on submerging in hot water.
B. Breaking of telephone wires hung overhead on poles in cold weather.
C. Cracking of a thick-walled glass when hot water is poured into it rapidly.
D. Buckling of railway lines.

ACHIEVERS SECTION

46. Jayesh bought three different kinds of fish, P, Q and R. He put fish P population and fish Q population into tank X, and fish P population and fish R population into Y. He recorded the number of each fish in each tank for a week. There were no dead fish in the tank when he checked every day. The graphs below show the results at the end of the week.



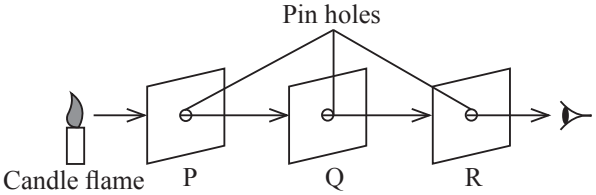
Tank X



Tank Y

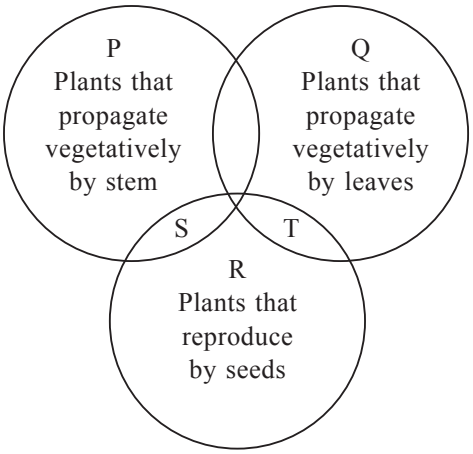
Which of the following shows the prey-predator relationship between the three fishes?
A. P → Q → R
B. Q → P → R
C. R → P → Q
D. Q → R → P

47. Sunidhi could see a pointed beam of light on setting-up an experiment as shown here. She used sheets P, Q and R made of three different materials respectively. She noticed that when she replaced the sheet P with a sheet made of the same material as sheet Q, then she could see the whole candle.



Which of the following options is correct regarding P, Q and R?
A. Sheet Q is made of a transparent material.
B. Sheet R is made of a transparent material.
C. Sheet P is made of an opaque material.
D. All of these.

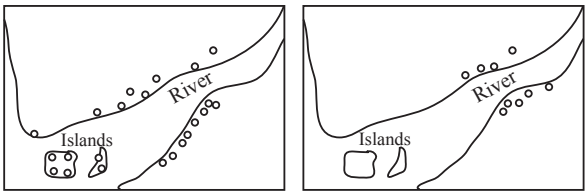
48. Refer to the given Venn diagram.



Select the correct option regarding P, Q, R, S and T.
A. S could be a rose plant whereas P could be a potato plant.
B. Q could be *Bryophyllum* and T could be strawberry.
C. R could be a fern or an alga.
D. Q could be spinach and P could be colocasia.

49. The given maps show the population of a plant as found presently, and five years ago.

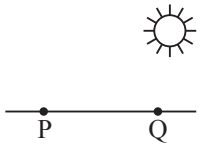
Based on the maps, it can be concluded that the plant is dispersed by _____.



Year : 2016 Year : 2011

A. Wind
B. Animals
C. Water
D. Splitting

50. P and Q are two distant places on earth located at about 125 kms distance. Which of the following assumptions can be made about these places?



A. The temperature at a particular time will be higher at place P than that at place Q.
B. Air current will flow from place P to Q.
C. It is afternoon at place Q while evening at place P.
D. None of these assumptions can be made.

SPACE FOR ROUGH WORK