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Level - 1 : Level-1 winners will get certificate, aptitude report, medals for the school toppers and online subscription.

Level - 2 : Top 10 % including school toppers will be selected for level-2-National level - online computer based interactive test held at exam centres all over India. Besides selection for level-3, winner will get merit certificate, aptitude report, medals, Mp3 player, watches, educational CDs, laptop, scholarship, online subscription etc.

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- You are allowed additional 10 minutes to fill the required details in the **RESPONSE SHEET**.
- The question paper is made as per syllabus guidelines & pattern given in the information Booklet. The Question Paper for Classes 1 to 6 contains 25 Questions each to be answered in 40 minutes. The Question paper for classes 7 to 12 contains 50 Questions each to be answered in 60 minutes. All questions are compulsory. Further instructions are given in the instruction letter to the coordinator teacher.
- Use the response sheet to mark your responses by darkening the required circle. The response sheet has to be returned to the foundation, duly filled in. The student can retain the Question Paper.

**NATIONAL
INTERACTIVE
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OLYMPIAD**

N I S O

**10
Class**

**A1
Paper
Code**

LEVEL - 1

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GENERAL IQ

- Suppose 8 monkeys took 8 minutes to eat 8 bananas. How much time would it take for 3 monkeys to eat 3 bananas?
 - 3 minutes
 - 4 minutes
 - 8 minutes
 - None of these
- If '+' means '÷', '-' means 'x', 'x' means '-' and '÷' means '+'. Which of the following will be the value of the expression,
 $20 \div 10 - 6 + 4 \times 8 = ?$
 - 37
 - 27
 - 52
 - None of these
- In the following question, a number series is given with one term missing. Choose the correct alternative that will continue the same pattern and fill in the blank spaces.
13, 57, 911, 1315, 1719, ———
 - 2123
 - 1879
 - 1784
 - None of these
- Which word if pronounced right, is wrong, but if pronounced wrong, is right?
 - Right
 - Wrong
- Both 1 and 2
- None of these
- Find the odd one out?
First Second Third Forth Fifth Sixth Seventh Eighth
 - First
 - Third
 - Forth
 - None of these
- If you are in a race, what place are you in if you take over the person who is in second place?
 - Second
 - First
 - Third
 - None of these
- A man says, "brothers and sisters, have I none, but that man's father is my father's son." Who is he pointing at?
 - His nephew
 - His son
 - His grandson
 - None of these
- A chicken farmer had some cows and a total of 30 animals, and the animals have 74 legs in all. How many chicken does the farmer have ?
 - 23
 - 24
 - 25
 - None of these
- A scientist is experimenting with bacteria that are 1 micron

in diameter and that reproduce by dividing every minute into 2 bacteria. At 12:00 PM, she puts a single organism in a container. At precisely 1:00 PM, the container is full. At what time was the container half full?

- (1) 12 :57 PM (2) 12 : 58 PM
 (3) 12:59 PM (4) None of these

10. What occurs once in every minute, twice in every moment, yet never in a thousand years?

- (1) m (2) n
 (3) o (4) None of these

GENERAL SCIENCE

11. Who is the author of the book “The Origin of Species”?

- (1) Ernst Haeckel (2) Charles Darwin
 (3) Robert Whittaker (4) None of these

12. An iron nail sinks when placed on the surface of water while a cork floats. This is because

- (1) The upthrust of water on the iron nail is less than the weight of the nail while the upthrust of water on the cork is greater than the weight of the cork.
 (2) The upthrust of water on the iron nail is greater than the weight of the nail while the upthrust of water on the cork is less than the weight of the cork.
 (3) The force due to gravitational attraction of the earth is less on the nail and greater on the cork.
 (4) None of these

13. Xylem and phloem are examples of complex tissues in which

- (1) Xylem consists of sieve tubes, tracheids, companion cells and xylem parenchyma whereas phloem consists of vessels, tracheids, phloem fibres and phloem parenchyma.
 (2) Xylem consists of tracheids, companion cells, xylem parenchyma and sieve tubes whereas phloem consists of vessels, sieve tubes, tracheids and phloem fibres.
 (3) Xylem consists of tracheids, vessels, xylem parenchyma and xylem fibres whereas phloem consists of sieve tubes, companion cells, phloem fibres and phloem parenchyma.
 (4) None of these

14. A solution contains 40 gm of common salt in 320 gm of water. The concentration in terms of mass by mass percentage of the solution is

- (1) 10.1 % (2) 11.1 %
 (3) 12.1 % (4) None of these

15. Cotyledons are called ‘Seed leaves’ because

- (1) They emerge and gets modified to become a fruit and thus represent a bit of pre-designed plant in the seed.
 (2) They emerge and become green when the seed germinates thus representing a bit of pre-designed plant in the seed.
 (3) They emerge and serve for the initial growth of the embryo during germination.
 (4) None of these

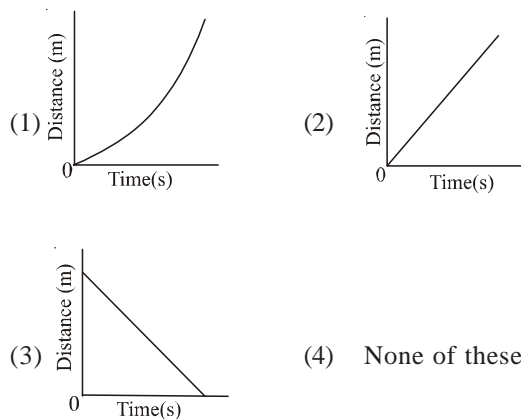
16. Which of the following characteristics given below is false in the case of fungi?

- (1) They are eukaryotic autotrophs which have the capacity to become multicellular organisms
 (2) They use decaying organic material as food and are therefore called saprophytes.
 (3) They have cell-walls made of a tough complex sugar called chitin.
 (4) None of these

17. The mitochondria also known as the power house of the cell has an outer membrane which is porous and an inner membrane which is deeply folded. The advantage is that

- (1) The folds provide turgidity and rigidity to the cell.
 (2) The folds provide connections with the membrane of the endoplasmic reticulum and constitute a portion of a complex cellular membrane system.
 (3) The folds create a large surface area for ATP generating chemical reactions.
 (4) None of these

18. Which of the following distance-time graphs show the movement of an object with uniform speed?



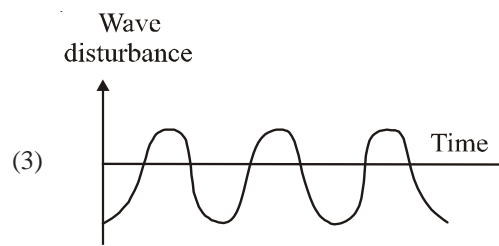
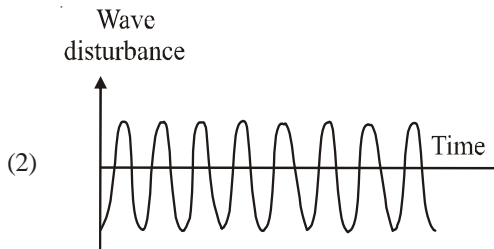
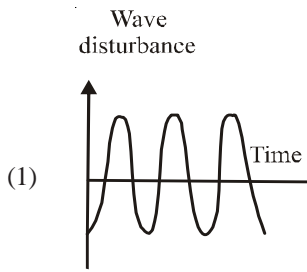
19. An object travels 16m in 4s and then another 16m in 2s. The average speed of the object is

- (1) 5.33 ms^{-1} (2) 6.5 ms^{-1}
 (3) 4.2 ms^{-1} (4) None of these

20. Which of the following statements is correct?

- (1) The force of attraction between any two objects is inversely proportional to the product of their masses and directly proportional to the square of the distance between them.
 (2) The force of attraction between any two objects is proportional to the product of their masses and inversely proportional to the square of the distance between them.
 (3) The force of attraction between any two objects is inversely proportional to the product of their density and directly proportional to the square of the distance between them.
 (4) None of these

21. Which of the following graphs show the soft sound?



(4) None of these

22. If the earth is providing no centripetal force, which of the following will happen?

- (1) The rotation of the earth on its own axis will not take place
- (2) The movement of planets around the sun will be hindered in the absence of this force
- (3) If there is no centripetal force, the moon would pursue a uniform straight line motion.
- (4) None of these

23. Inter-cropping is a little more advantageous than mixed cropping because

- (1) Inter-cropping ensures maximum utilisation of the nutrients supplied and prevents pests and diseases from spreading to all the plants belonging to one crop in a field.
- (2) Inter-cropping utilizes the availability of moisture and irrigation facilities, there by deciding the crop to be cultivated after one harvest.
- (3) Inter-cropping reduces risk and gives some insurance against failure of one of the crops.
- (4) None of these

24. Which of the following requires a greater force – accelerating a 2 kg mass at 5 ms^{-2} or a 4 kg mass at 2 ms^{-2} ?

- (1) Accelerating a 4 kg mass at 2 ms^{-2}
- (2) Accelerating a 2 kg mass at 5 ms^{-2}
- (3) Both of these require the same force
- (4) None of these

25. In which of the following media does sound travel the fastest at a particular temperature?

- (1) Oxygen
- (2) Water
- (3) Aluminium
- (4) None of these

26. Displacement is the

- (1) Distance travelled by the object in unit time.
- (2) The actual distance between the initial and final positions.
- (3) Shortest distance between initial and final positions.
- (4) None of these

27. Which of the following cell organelles are called “suicide bags.”?

- (1) Peroxisome
- (2) Lysosome
- (3) Golgi body
- (4) None of these

28. 1 mole of NH_3 molecules contain

- (1) 6.022×10^{23} NH_3 molecules
- (2) 6.022×10^{23} NH_3 atoms
- (3) 6.022×10^{22} NH_3 molecules
- (4) None of these

29. The definition of ionization energy

- (1) Ionization energy is defined as the energy change when an electron is gained by a neutral gaseous atom converting it into a negatively charged ion.
- (2) Ionization energy is defined as the energy required to remove an electron completely from an isolated gaseous atom or ion of an element.
- (3) Ionization energy is defined as the energy required to remove an electron from the outer most shell of an isolated atom.
- (4) None of these

30. Which of the following is a characteristic of striated muscle?

- (1) Cells are long with pointed ends.
- (2) Each cell has only one nucleus situated in the centre.
- (3) Transverse alternate light and dark bands or striations are seen.
- (4) None of these

31. Which of the following tissue perform the functions of binding, supporting and packing together different organs of the body?

- (1) Connective tissue
- (2) Muscle tissue
- (3) Epithelial tissue
- (4) None of these

32. The protective tissue in plants found in the roots and stem are heavily thickened by the deposition of

- (1) Wax
- (2) Suberin
- (3) Cellulose
- (4) None of these

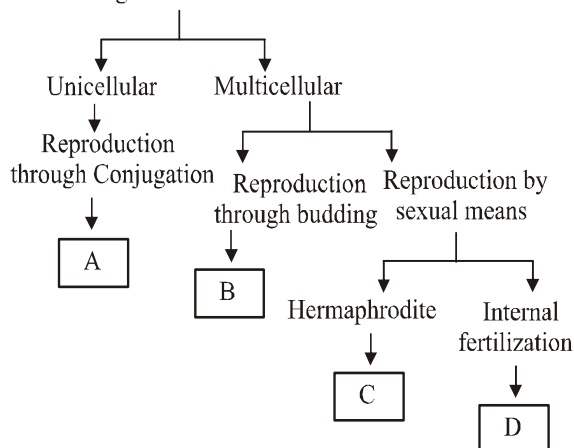
33. Which of the following is correctly matched?

- (1) Hydra – (a) Porifera
- (2) Earthworm – (b) Coelenterata
- (3) Spongila – (c) Annelida
- (1) 1 – b, 2 – c, 3 – a
- (2) 1 – c, 2 – a, 3 – b
- (2) 1 – b, 2 – a, 3 – c
- (4) None of these

34. Which of the following statement is correct?
- (1) Archimedes principle states that the acceleration produced in a body is directly proportional to the force acting on it.
 - (2) Archimedes principle states that the relative density of a substance is the ratio of its density to that of water.
 - (3) Archimedes principle states that when a body is immersed fully or partially in a fluid, it experiences an upward force that is equal to the weight of the fluid displaced by it.
 - (4) None of these
35. Which of the following is the correct formula of Aluminium sulphate?
- (1) $Al(SO_4)_2$
 - (2) $Al_2(SO_4)_3$
 - (3) Al_2SO_4
 - (4) None of these
36. Which of the following diseases is caused by contaminated food and water ?
- (1) Cholera
 - (2) Tuberculosis
 - (3) Marasmus
 - (4) None of these
37. In Phylum Hemichordata the sexes are mostly separate. An example for such an animal in phylum Hemichordata is
- (1) Echinus
 - (2) Herdmania
 - (3) Balanoglossus
 - (4) None of these
38. The main component of the cell wall responsible for providing structural strength to the plants.
- (1) Chitin
 - (2) Cellulose
 - (3) Endoplasmic Reticulum
 - (4) None of these
39. Which is called absolute zero of temperature?
- (1) $-273.15^\circ C$
 - (2) $273 K$
 - (3) $100^\circ C$
 - (4) None of these
40. Why is inter-conversion of states of matter considered physical change?
- (1) Because the state changes from one form to another
 - (2) Because they have the same physical properties
 - (3) Because the chemical composition of the substance remains unchanged
 - (4) None of these

ETG INTERACTIVE SECTION

41. Refer the chart to answer the following animals A, B, C, D
Kingdom Animalia



- (1) A – Hydra, B – Earthworm, C – Paramecium, D – Man
- (2) A – Paramecium, B – Hydra, C – Earthworm, D – Man

- (3) A – Earthworm, B – Paramecium, C - Man, D – Hydra
- (4) None of these

42. A body of mass m moving with velocity v has kinetic energy.

- (1) $\frac{1}{2}mv^2$
- (2) $ma\left(\frac{1}{2}at^2\right)$

- (3) $ut + \frac{1}{2}at^2$
- (4) None of these

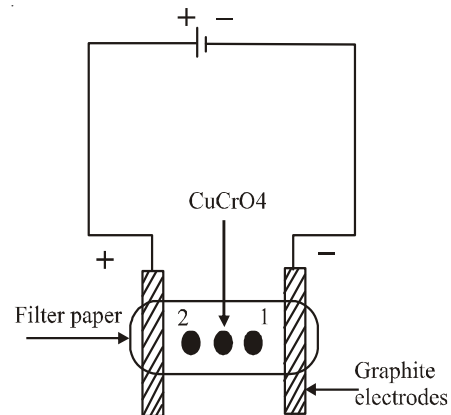
43. In a 100 metre race, Mohan took 10 s to reach the finishing point. What will be his velocity?

- (1) 100 m/s
- (2) 20 m/s
- (3) 10 m/s
- (4) None of these

44. Liquids have fluidity and do not have a definite shape. This is because in liquids

- (1) Intermolecular forces are extremely weak and constituent particles are free to move and can occupy any space available to them.
- (2) Intermolecular forces are strong enough to keep the particles within the bulk in aggregation but not strong enough to keep them in fixed positions.
- (3) Intermolecular forces are strong to keep the particles together.
- (4) None of these

- 45.



Take a filter paper strip and soak it with potassium nitrate solution. Wrap the wet paper at its ends in 2 graphite rods as shown in the above diagram. Put a spot of copper chromate solution in the centre of the paper strip. What happens when electric current is passed through the graphite rods?

- (1) The coloured spot due to copper chromate would split into 2 separate coloured spots. The blue coloured spot of Cu^{2+} ions (Spot 1) move towards the cathode and yellow spot of CrO_4^{2-} ions (Spot 2) move towards the anode
- (2) The coloured spot due to copper chromate would split into 2 separate coloured spots. The blue coloured spot of Cu^{2+} ions (Spot 1) move towards the anode and yellow spot of CrO_4^{2-} ions (Spot 2) move towards the cathode.
- (3) The coloured spot due to copper chromate would split into 2 separate coloured spots. The blue coloured spot

of CrO_4^{2-} ions (Spot 1) move towards the cathode and yellow spot of Cu^{2+} ions (Spot 2) move towards anode.

- (4) None of these

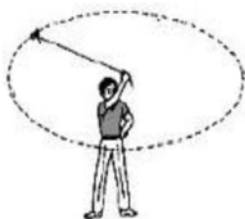
46.



When a gun is fired, the bullet leaves the barrel with some velocity. Which of the following statement is false?

- (1) The initial momentum of both the bullet and gun was zero.
- (2) When the gun is fired, the bullet acquires certain velocity and therefore some momentum as it leaves the gun.
- (3) The momentum before and after firing should remain conserved. Therefore the gun must have a momentum equal to that of the bullet in the same direction.
- (4) None of these

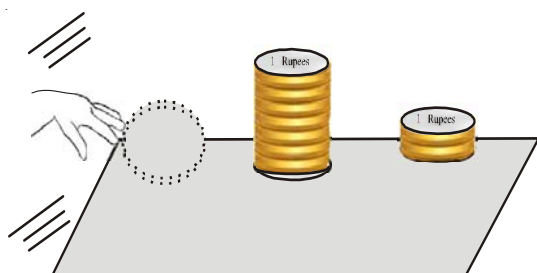
47.



Take a piece of thread and tie a small piece of stone at its one end. Holding the thread at the other end, whirl the stone in a circular path with a velocity of constant magnitude. Now release the thread and note the direction in which the stone moves. From this experiment it is clear that

- (1) The velocity of motion of a body along a circular path is same at every point although the distance moved by it in unit time may be constant.
- (2) The direction of motion of a body moving along a circular path changes at every point although the distance moved by it in unit time may be constant.
- (3) The direction of motion of a body moving along a circular path is constant at every point although the distance moved by it in unit time may change.
- (4) None of these

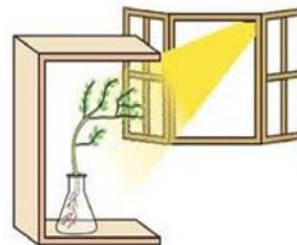
48.



Make a pile of similar coins as shown in the above figure. Strike at the bottom of the pile by flicking another coin with your fingers. If we strike fast enough we find that only the coin at the bottom moves out of the pile and the rest of the pile remains intact. This is because

- (1) The inertia of the remaining coins prevent them from moving.
- (2) The rate of change of momentum of the coin is directly proportional to the force applied on the pile of coins.
- (3) The total momentum remains conserved after the coin moved out of the pile.
- (4) None of these

49.



Fill a conical flask with water and cover the neck of the flask with a wire mesh. Keep 2 or 3 freshly germinated bean seeds on the wire mesh. Take a card board box which is open from one side. Keep the flask in the box in such a manner that the open side of the box faces light coming from a window. After two or three days what will be your observation and why?

- (1) After 2 or 3 days we will notice that the roots of the plant will move towards light and the shoots will bend away from light. This is because environmental triggers such as light or gravity has no effect in the change of direction of plant parts.
- (2) After 2 or 3 days we will notice that both the roots and shoot of the plant will move towards light. This is because environmental triggers such as light or gravity has effects in the change of directions of plant parts.
- (3) After 2 or 3 days we will notice that the shoot bends towards light and roots move away from light. This is because environmental triggers such as light or gravity will change the directions of plant parts.
- (4) None of these

50. Bats are able to search their prey in dark. This is possible because

- (1) Bats do this by emitting and detecting reflections of ultrasonic waves. The high pitched ultrasonic squeaks of the bat are reflected from the obstacles or prey and returned to the bat's ear.
- (2) Bats have a sharp vision in the dark because their retina contains lots of rods and no cone cells. Thus they are able to search their prey in dark.
- (3) Both 1 and 2
- (4) None of these



END OF THE EXAM