



# EDUHEAL FOUNDATION



## INTERACTIVE OLYMPIADS

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|---|---|---|--|---|--|
| <b>ICO</b><br>INTERNATIONAL<br>CYBER OLYMPIAD | <b>NISO</b><br>NATIONAL INTERACTIVE<br>SCIENCE OLYMPIAD | <b>NIMO</b><br>NATIONAL INTERACTIVE<br>MATHS OLYMPIAD | <b>NBTO</b><br>NATIONAL<br>BIOTECHNOLOGY<br>OLYMPIAD | <b>IEO</b><br>INTERNATIONAL<br>ENGLISH OLYMPIAD | <b>IGO</b><br>INTERNATIONAL<br>G.K. OLYMPIAD |
|---|---|---|--|---|--|

**NATIONAL  
BIOTECHNOLOGY  
OLYMPIAD**

**N B T O**

**8**  
Class

**A1**  
Paper  
Code

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Creating  
**SUCCESS**  
Stories

A Unit of EDUSYS LEARNING MEDIA

AIEEE • IIT • PMT • OLYMPIADS

### IMPORTANT INFORMATION

1. You are allowed additional 10 minutes to fill the required details in the **RESPONSE SHEET**.
2. 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.
3. 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.

### GENERAL KNOWLEDGE

1. What is the most common cause of pollution of streams, rivers and oceans?
  - (1) Dumping of garbage by cities
  - (2) Surface water running off yards city streets and farm field
  - (3) Trash washed into the ocean from beaches
  - (4) None of these
2. Select the appropriate sequence
  - (1) Global warming → Melting snow → rising sea level → floods
  - (2) Volcanic dust → traps carbon dioxide → global warming
  - (3) Green house effect → carbon dioxide traps heat → melting snow
  - (4) All of the above
3. What human activities causes ozone depletion?
  - (1) Industrial halo carbons
  - (2) Smog from vehicles
  - (3) Cigarettes
  - (4) None of these
4. The method used for controlling gaseous pollutants
  - (1) Absorption
  - (2) Combustion
  - (3) Both (1) and (2)
  - (4) None of these
5. Wrapping biodegradable waste in polythene bags will
  - (1) Decrease the decomposition process
  - (2) Have no effect on decomposition process
  - (3) Increase the decomposition process
  - (4) None of these
6. Land fill is an area
  - (1) Where the collected garbage is recycled
  - (2) Where the collected garbage is dumped
  - (3) Both (1) and (2)
  - (4) None of these
7. Which recyclable commodity is most valuable?
  - (1) Paper
  - (2) Aluminium
  - (3) Glass
  - (4) None of these
8. What do some scientists believe will happen to deserts?
  - (a) They will become wet grasslands
  - (b) They will remain the same
  - (c) They will expand
  - (d) None of these
9. The massive hole in the ozone layer over the antarctica was first discovered in
  - (1) 1905
  - (2) 1950
  - (3) 1985
  - (4) None of these
10. Which country is the largest source of global warming pollution?
  - (1) Japan
  - (2) United States
  - (3) India
  - (4) None of these

**LIFE SCIENCE**

11. Gases found in primitive atmospheres are  
 (1) CH<sub>4</sub>, NH<sub>3</sub>, H<sub>2</sub>, H<sub>2</sub>O ( vapour form)  
 (2) CH<sub>4</sub>, NH<sub>3</sub>, CO<sub>2</sub>, H<sub>2</sub>O  
 (3) CH<sub>4</sub>, H<sub>2</sub>O, CO<sub>2</sub>  
 (4) None of these
12. Which one carries genetic message to ribosome?  
 (1) t-RNA (2) r-RNA  
 (3) m-RNA (4) None of these
13. These three plants have all been growing on the same sunny windowsill for 6 weeks. What may have caused the difference in appearance?



- (1) Difference amounts of light  
 (2) Temperature differences  
 (3) Different sized pots  
 (4) None of these
14. A student is studying the parts of a leaf.



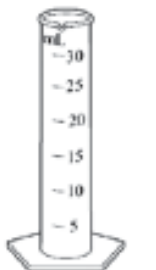
Which tool will most help the student count all the veins in the leaf?



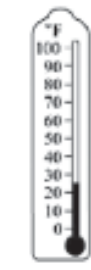
(1) hand lens



(2) balance



(3) graduated cylinder

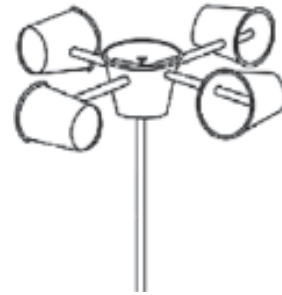


(4) thermometer

15. Why is soil important to the plant?  
 (1) The soil prevents dust from getting to the leaves.  
 (2) The soil provides support and nutrients for the grass.

- (3) The soil provides a place for insects and worms to live  
 (4) All the above

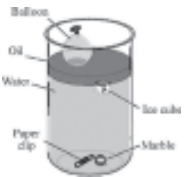
16. What would Meena be able to measure using this tool?



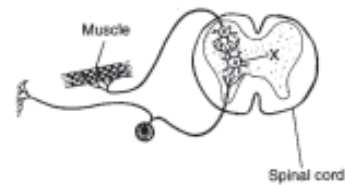
- (1) Wind temperature (2) Wind direction  
 (3) Wind speed (4) None of these

17. Which of these is floating on water but sinking in oil?

- (1) The paper clip (2) The marble  
 (3) The ice cube (4) The balloon



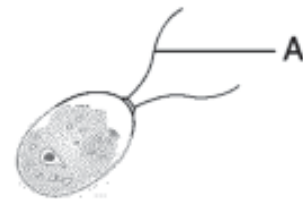
18. A reflex arc is illustrated in the diagram below.



Structure X represents

- (1) an effector (2) a motor neuron  
 (3) an interneuron (4) a receptor

19. The diagram below represents a green alga. Which process is most closely associated with structure A?



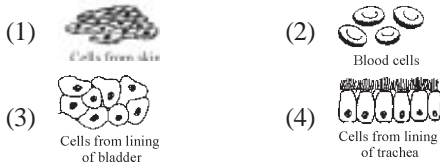
- (1) excretion (2) locomotion  
 (3) transport (4) reproduction

20. What is the principal function of structure X represented in the diagram below?



- (1) filtration of cellular wastes from the blood
- (2) transport of urine out of the body
- (3) storage of urine
- (4) secretion of hormones

21. Some human body cells are shown in the diagrams below.



These groups of cells represent different

- (1) Tissues in which similar cells function together
  - (2) Organs that help to carry out a specific life activity
  - (3) Systems that are responsible for a specific life activity
  - (4) Organelles that carry out different functions
22. Which process is *least* likely to add to the variety of traits in a population?
- (1) Deletion of bases from DNA
  - (2) Genetic engineering
  - (3) Accurate replication of DNA
  - (4) None of these
23. Which organisms are represented in the cartoon below?

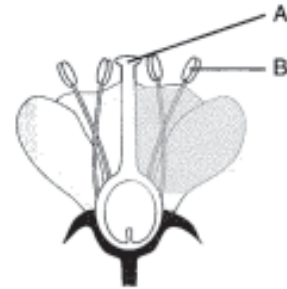


- (1) coelenterates
  - (2) arthropods
  - (3) annelids
  - (4) chordates
24. Identify the plant drawn in diagram Q.



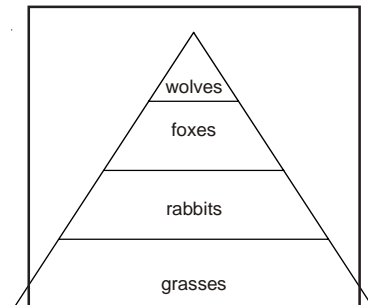
- (1) Grass
  - (2) Mustard
  - (3) Soyabean
  - (4) Wheat
25. The process of respiration is similar to:
- (1) Sedimentation
  - (2) Combustion
  - (3) Reduction
  - (4) None of these

26. DNA has genetic properties was revealed for the first time by
- (1) Griffith
  - (2) Avery
  - (3) Wilkins
  - (4) None of these
27. During favourable condition the existing amoeba divide by multiple fission and produce many pseudopodiospheres. This phenomenon is known as
- (1) Budding
  - (2) Sporulation
  - (3) Fragmentation
  - (4) None of these
28. The diagram below represents a flower.



The transfer of reproductive structures from B to A is known as

- (1) fertilization
  - (2) self-pollination
  - (3) differentiation
  - (4) cross-pollination
29. The picture below shows an energy pyramid.



What will most likely happen to the foxes and the wolves if the rabbits are removed?

- (1) The foxes will eat more wolves.
  - (2) There will be fewer foxes and wolves.
  - (3) There will be more foxes and wolves
  - (4) None of these
30. During an investigation Atul and Vibha collected the following data.

**Amount of Light vs. Height of Grass**

| Amount of Light (hours) | Average Height of Grass (cm) |        |        |        |
|-------------------------|------------------------------|--------|--------|--------|
|                         | Start                        | Week 1 | Week 2 | Week 3 |
| 2                       | 1                            | 2      | 3      | 4      |
| 6                       | 1                            | 3      | 5      | 7      |
| 12                      | 1                            | 5      | 9      | 13     |

What question were Atul and Vibha asking in their investigation?

- (1) How does the amount of light affect the colour of grass?
- (2) How does the amount of light affect the thickness of grass?
- (3) How does the amount of light affect the height of grass?
- (4) None of these

31. In molecular biology we study \_\_\_\_\_?
- (1) DNA Technology & Genetic engineering
  - (2) Cell Culture
  - (3) Phylum
  - (4) None of these

32. The use of micro - organisms such as bacteria to remove environmental and often Poisonous pollutants from soil and water is \_\_\_\_\_ ?
- (1) Waste management (2) Bioremediation
  - (3) Biopharming (4) None of these

33. Human has two complete sets of
- (1) 21 Chromosome (2) 22 Chromosome
  - (3) 23 Chromosome (4) None of these

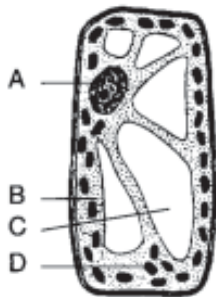
34. The equation below summarizes some of the reactions involved in a specific biochemical process.



The source of the hydrogen in the equation is most likely

- (1)  $C_6H_{12}O_6$  (2) PGAL
- (3)  $H_2O$  (4) None of these

35. In which structure of the cell shown below do photolysis and carbon-fixation reactions occur?



- (1) A (2) B
- (3) C (4) D

36. The diagram below shows a milkweed plant and some of the insects that live on it or visit it.



Which term best describes the group of organisms in the diagram?

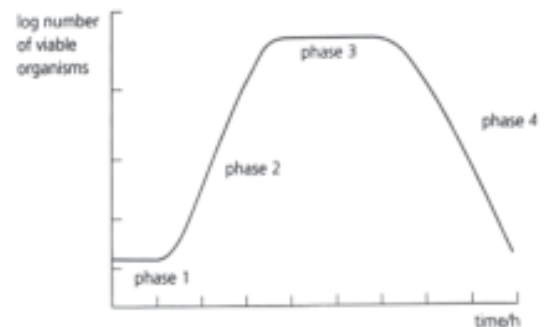
- (1) biosphere (2) community
- (3) biome (4) None of these

37. Which of the following statements is not correct?
- (1) forests protect the soil from erosion
  - (2) plants and animals in a forest are not dependent on one another
  - (3) forest influence the climate and water cycle
  - (4) none of these

38. Which type of organisms are used in bio-technology?
- (1) Living (2) Non Living
  - (3) Culture (4) All of these

39. Where in the mitochondrion do the reactions of the electron transport chain occur?
1. on the inner membrane
  2. on the outer membrane
  3. in the matrix of the mitochondrion
- (1) 1 only (2) 2 only
  - (3) 3 only (4) None of these

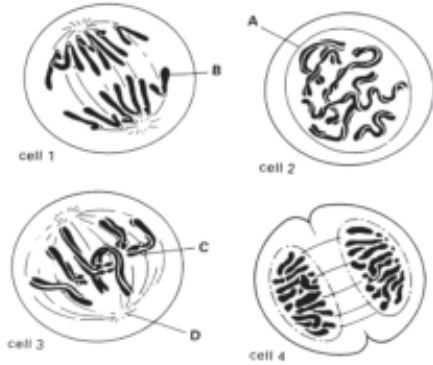
40. The following graph shows the growth of a bacterial culture. Which of the following statements about this graph are true?



1. In phase 3 some bacteria may be dividing
  2. Phase 2 is called the lag phase and Phase 1 is called the log phase
  3. Phase 4 could be caused by the build-up of metabolic toxins
  4. Growth in Phase 2 follows an arithmetical progression
  5. The fastest rate of growth is seen at the plateau, Phase 3
- (1) 1 & 3 (2) 2 & 5
  - (3) 3 & 4 (4) 1 & 4

## EtG INTERACTIVE SECTION

The diagrams show four animal cells in different stages of mitosis. (Ans. Q. No. 41 - 44)



41. Using the number given to each cell above, select the stages in the correct mitotic sequence.  
 (1) 2, 3, 1, 4                      (2) 3, 1, 4, 2  
 (3) 1, 4, 2, 3                      (4) None of the above
42. Using the letters, select the correct stage of mitosis from the list for cell 2 and cell 3.  
 A. prophase  
 B. metaphase  
 C. anaphase  
 D. telophase  
 (1) Cell 2 - C, Cell 3 - D    (2) Cell 2 - A, Cell 3 - D  
 (3) Cell 2 - A, Cell 3 - B    (4) None of these
43. What is the diploid number of chromosomes in Cell 3?  
 (1) 6                                      (2) 4  
 (3) 12                                    (4) None of the above
44. Using the letters A, B, C, & D from the diagrams above, identify the structure which produces microtubules  
 (1) D                                      (2) B  
 (3) A                                      (4) None of these

Based on the picture answer the following question.(45 - 47)

45. Name the leaf



- (1) Lotus                                (2) Hydrilla  
 (3) Bryophyllum leaf    (4) Water hyacinth
46. Name the type of reproduction taking place in the leaf  
 (1) Vegetative reproduction  
 (2) Regeneration  
 (3) Asexual reproduction  
 (4) None of these
47. Which type of tissues are present in the notches of the leaf?  
 (1) Permanent tissues    (2) Meristematic tissues  
 (3) Protective tissues    (4) None of these
48. The conversion of  $\text{NO}_3$  to  $\text{N}_2$  is called  
 (1) Nitrification                      (2) Nitrogen fixation  
 (3) Ammonification                (4) None of these
49. Select the correct sequence from the following (Q. 49-50)  
 (1) Gametogenesis  $\rightarrow$  syngamy  $\rightarrow$  zygote  $\rightarrow$  embryogenesis  
 (2) gametogenesis  $\rightarrow$  syngamy  $\rightarrow$  embryogenesis  $\rightarrow$  zygote  
 (3) zygote  $\rightarrow$  embryogenesis  $\rightarrow$  syngamy  $\rightarrow$  gametogenesis  
 (4) syngamy  $\rightarrow$  gametogenesis  $\rightarrow$  zygote  $\rightarrow$  embryogenesis
50. Syngamy is a process of  
 (1) fusion of similar spores  
 (2) fusion of gametes  
 (3) fusion of dissimilar spores  
 (4) None of these



**END OF THE EXAM**

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