



# EHF

LEARNING FOR LIFE

## EDUHEAL FOUNDATION

# CLASS 12

## LEVEL - 1

## Set A1

### EHF OLYMPIADS

- 4000 schools • 6 lakh students
- 10 olympiads • Global outreach



### EHF

## NATIONAL BIOTECHNOLOGY OLYMPIAD

Name : .....

Roll No : .....

Class : .....

School : .....



### art and cricket clinic contest

#### NATIONAL BIOTECHNOLOGY OLYMPIAD



#### NATIONAL MATHS OLYMPIAD



#### NATIONAL SCIENCE OLYMPIAD



#### INTERNATIONAL CYBER OLYMPIAD



#### INTERNATIONAL ENGLISH OLYMPIAD



#### INTERNATIONAL GENERAL KNOWLEDGE OLYMPIAD



### BSE INVESTORS' PROTECTION FUND

### BSE international finance olympiad (BIFO)



### NATIONAL IIT-PMT OLYMPIAD (NIPO)

**Level - 1 :** All Level-1 successful\* participants will get certificate, aptitude report and online subscription, and school toppers will be eligible for school hero medals.

**Level - 2 :** 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, medals, educational CDs, laptop, scholarship and other prizes. There is no level-2 in Art and Cricket.

**Level - 3 :** Toppers will qualify\* for level-3-International level-where you will compete with students globally. Get selected for EHF's International Olympiad training camp. Only Indian organization giving students exposure to global competitions. Represent India & win laurels. Guidance by top scientists. Prizes ranges from cash (millions of \$), gadgets, foreign trips, publicity, fame, scholarships, Internships, conference participation and more.

\* # See prospectus website for details

#### Instructions for the Candidate

1. You are allowed additional 10 minutes to fill the required details in the RESPONSE SHEET (OMR).
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 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.

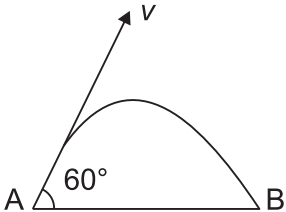
WEBSITE : [WWW.EDUHEALFOUNDATION.ORG](http://WWW.EDUHEALFOUNDATION.ORG)  
E-MAIL : [INFO@EDUHEALFOUNDATION.ORG](mailto:INFO@EDUHEALFOUNDATION.ORG)

# ROUGH WORK

# GENERAL KNOWLEDGE

- Some plants store waste in their fruits in the form of solid bodies called  
(1) raphides (2) lenticels  
(3) stomata (4) none of these
- Name an organism which contains single chromosome and cell division occurs through fission or budding?  
(1) Eukaryotes (2) Prokaryotes  
(3) Bacteria (4) None of these
- Complete digestion of food occurs in  
(1) stomach (2) small intestine  
(3) pancreas (4) none of these
- Which of the following gland controls the blood pressure?  
(1) Thalamus gland (2) Adrenal gland  
(3) Thyroid gland (4) None of these
- Rod shaped bacteria are called  
(1) streptococci (2) bacilli  
(3) staphylobacilli (4) none of these
- The gas used for artificial ripening of green fruit is  
(1) ethylene (2) ethane  
(3) carbon dioxide (4) none of these
- Who came up with the idea for Instant Mashed Potato?  
(1) S. Tuberosum (2) W. Raleigh  
(3) E. Asselbergs (4) None of these
- The oil of citronella is obtained from which plant?  
(1) Lemongrass (2) Bamboo  
(3) Dwarf Reedgrass (4) None of these
- This plant has recently been in the news as a potential substitute for diesel and a biofuel for the future. Name it.  
(1) Wheat (2) Sunflower  
(3) Physic nut (4) None of these
- Native to tropical Asia including India, which tree bears the world's largest edible fruit?  
(1) Jackfruit (2) Watermelon  
(3) Papaya (4) None of these

## SECTION B: PHYSICS AND CHEMISTRY

- A projectile of mass  $m$  is thrown with a velocity  $v$  making an angle  $60^\circ$  with the horizontal. Neglecting air resistance, the change in momentum from the departure at A to its arrival at B, along vertical direction is  
  
(1)  $2mv$  (2)  $\sqrt{3}mv$   
(3)  $mv$  (4) None of these
- What is the force acting on an object of mass 10 kg moving with a uniform velocity of 10 m/s?  
(1) 10 N (2) 100 N  
(3) 0 (4) None of these
- A body moves a distance of 10 m along a straight line under the action of 5 N force. If work done is 25 J, then angle between the force and direction of motion of the body will be  
(1)  $75^\circ$  (2)  $60^\circ$   
(3)  $45^\circ$  (4) None of these
- Based on the first law of thermodynamics, which one of the following is correct?  
(1) For an isothermal process,  $q = +w$   
(2) For an isochoric process,  $\Delta U = -q$   
(3) For a cyclic process,  $q = -w$   
(4) None of these

15. Two point charges repel each other with a force  $F$  when placed in water of dielectric constant 81. What will be the force between them when placed the same distance apart in air?
- (1) 81  $F$  (2) 91  $F$   
 (3) 89  $F$  (4) None of these
16. Maximum number of electrons in a subshell with  $l = 3$  and  $n = 4$  is
- (1) 10 (2) 12  
 (3) 14 (4) None of these
17. In the modern periodic table, which period contains 32 elements?
- (1) Sixth (2) First  
 (3) Seventh (4) None of these
18. Among the following species octahedral shape is found in

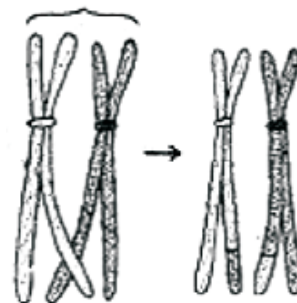
- (1)  $SF_6$  (2)  $PCl_5$   
 (3)  $HgCl_2$  (4) None of these
19. A vessel of 120 mL capacity contains a certain amount of gas at  $35^\circ C$  and 1.2 bar pressure. The gas is transferred to another vessel of volume 180 mL at  $35^\circ C$ . What would be its pressure?
- (1) 0.9 bar (2) 0.5 bar  
 (3) 0.8 bar (4) None of these
20. Which of the following arrangements shows schematic alignment of magnetic moments of antiferromagnetic substances?
- (1)  $\uparrow \uparrow \uparrow \uparrow \uparrow \uparrow$   
 (2)  $\downarrow \downarrow \downarrow \downarrow \downarrow \downarrow$   
 (3)  $\uparrow \downarrow \uparrow \downarrow \uparrow \downarrow$   
 (4) None of these

## SECTION C: BIOLOGY

21. Combustion of coal in power plant produces mainly \_\_\_\_\_ which is a major pollutant of air.
- (1) Sulphur Dioxide (2) Nitrogen Dioxide  
 (3) Methane (4) None of these
22. At every 1 km increase in altitude, air gets about
- (1)  $10^\circ C$  cooler (2)  $6.5^\circ C$  hotter  
 (3)  $6.5^\circ C$  cooler (4) none of these
23. In which kingdom would you classify the archaea and nitrogen-fixing organism, if the five-kingdom system of classification is used?
- (1) Fungi (2) Plantae  
 (3) Monera (4) None of these
24. Syngenesious anthers and epipetalous stamens are found in
- (1) Liliaceae  
 (2) Malvaceae  
 (3) Compositae  
 (4) None of these



25. Thorn of Bougainvillea and tendril of cucurbita are examples of
- (1) Homologous organs (2) Analogous organs  
 (3) Retrogressive evolution (4) None of these
26. Which statement is true for Cockroach?
- (1) Ten ovarioles in ovary  
 (2) Nymph is caterpillar form  
 (3) Anal cerci are absent in female animal  
 (4) None of these
27. Given below is the representation of a certain event at a particular stage of a type of cell division. Which is this stage?
- (1) Prophase I during meiosis.  
 (2) Both prophase and metaphase of mitosis.  
 (3) Prophase of mitosis.  
 (4) None of these



28. Which of the following molecules is involved in the feedback control of the enzyme phosphorylase *a*?

- (1) Glucose-1-phosphate (2) Adrenaline  
(3) Glycogen (4) None of these

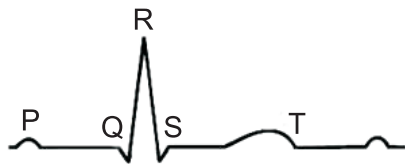
29. Cell elongation in internodal regions of the green plants takes place due to

- (1) Cytokinins (2) Gibberellins  
(3) Ethylene (4) None of these

30. The minerals involved in water-splitting reaction during photosynthesis are

- (1) Magnesium and Chlorine  
(2) Potassium and Manganese  
(3) Manganese and Chlorine  
(4) None of these

31. Given below is the ECG of a normal human. Which one of its components is correctly interpreted below?



- (1) Peak P and Peak R together – systolic and diastolic blood pressures.  
(2) Peak P – Initiation of left atrial contraction only.  
(3) Complex QRS – One complete pulse.  
(4) None of these

32. Aneurin is the other name for

- (1) Vitamin B6 (2) Vitamin B12  
(3) Vitamin B1 (4) None of these

33. Within which layer of the atmosphere do you find rain, snow, and clouds?

- (1) Troposphere (2) Stratosphere  
(3) Mesosphere (4) None of these

34. Which of the following represent maximum number of species among global biodiversity?

- (1) Ferns

- (2) Lichens  
(3) Fungi  
(4) None of these

35. Parallel venation are found in



- (1) monocots  
(2) dicot stem  
(3) dicot root  
(4) none of these

36. When cereal grains germinate, amylase and other hydrolytic enzymes are secreted by the

- (1) scutellam (2) suspensor  
(3) aleurone layer (4) none of these

37. Tapetum layer around the pollen sac is meant for

- (1) protection (2) fusion  
(3) nutrition (4) none of these

38. Which of the following organism does not obey the 'Cell Theory'?

- (1) Virus (2) Bacteria  
(3) Fungi (4) None of these

39. Which of these is the contractile protein of a muscle?

- (1) Tubulin (2) Tropomyosin  
(3) Myosin (4) None of these

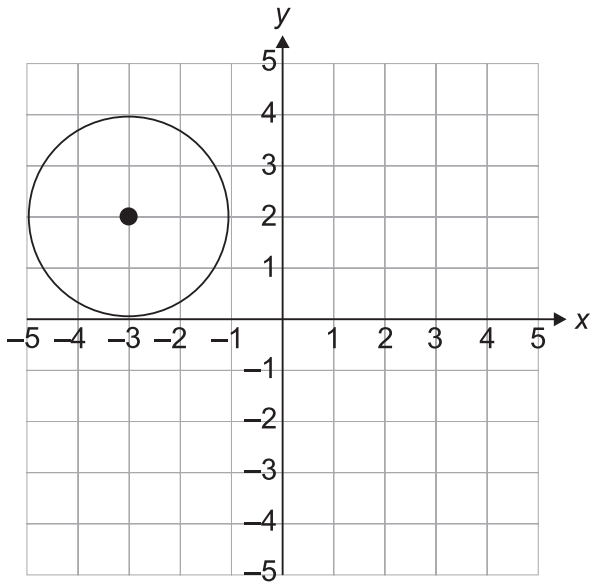
40. Identify the following figure:



- (1) Storage parenchyma  
(2) Palisade parenchyma  
(3) Lamellar collenchyma  
(4) None of these



31. Write an equation of the circle shown in figure:



- (1)  $(x + 5)^2 + (y - 2)^2 = 6$   
 (2)  $(x - 3)^2 + (y + 2)^2 = 7$   
 (3)  $(x + 3)^2 + (y - 2)^2 = 4$   
 (4) None of these

32. If a parallelepiped is formed by planes drawn through the points (5, 8, 10) and (3, 6, 8) parallel to the coordinate planes, then the length of diagonal of the parallelepiped is

- (1)  $\sqrt{2}$  (2)  $3\sqrt{2}$   
 (3)  $2\sqrt{3}$  (4) None of these

33. Find the indicated limit:  $\lim_{x \rightarrow 4} \frac{\sqrt{2x+1}-3}{\sqrt{x-1}-\sqrt{2}}$

- (1)  $\frac{2\sqrt{2}}{3}$  (2)  $\frac{2\sqrt{3}}{7}$   
 (3)  $\frac{3\sqrt{2}}{5}$  (4) None of these

34. A market research company has collected data on the price of a particular brand of soap in several different locations. The prices are as follows: ₹0.89, 0.95, 1.25, 1.36, 1.49, 1.65, 1.79, 1.89, 1.99. What are the upper and lower quartiles of soap prices for this brand?

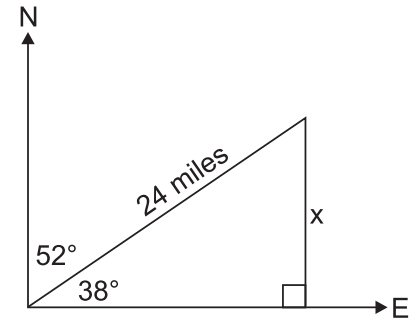
- (1) 1.72, 1.10 (2) 2.21, 0.74  
 (3) 1.84, 1.10 (4) None of these

35. A bag contains 2 red, 3 green and 2 blue balls. Two balls are drawn at random. What is the probability that none of the balls drawn is blue?

- (1)  $\frac{10}{21}$  (2)  $\frac{11}{21}$   
 (3)  $\frac{2}{7}$  (4) None of these

36. A plane has travelled 24 miles on a course heading  $52^\circ$  east of north. How far north ( $x$ ) has the plane travelled at this point? Express answer to the nearest hundredth of a mile.

- (1) 12.94 miles  
 (2) 14.78 miles  
 (3) 18.91 miles  
 (4) None of these



37. In how many ways can 5 men draw water from 5 taps if no tap can be used more than once?

- (1) 120 (2) 720  
 (3) 60 (4) None of these

38. Two cards are drawn together from a pack of 52 cards. The probability that one is a spade and one is a heart, is

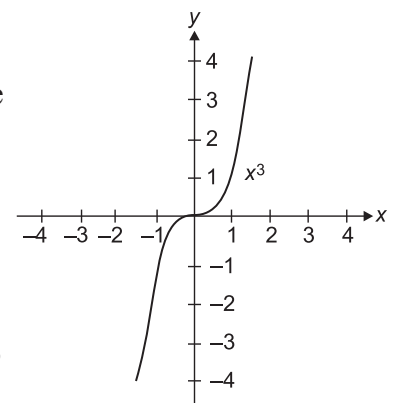
- (1)  $\frac{13}{102}$  (2)  $\frac{47}{100}$   
 (3)  $\frac{29}{34}$  (4) None of these

39. Write  $\sin[\tan^{-1} x]$  in terms of  $x$ .

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

40. Graph of  $y = x^3$  represents which type of function.

- (1) many-one and onto  
 (2) one-one but not onto  
 (3) one-one and onto  
 (4) none of these



# INTERACTIVE SECTION

41. Manufacturing recombinant DNA molecules involves cutting a gene from its normal location, inserting it into a circular piece of DNA from a bacterial cell, and then transferring the circle of DNA to cells of another species. Which of the below describe the circular piece of DNA from a bacterial cell?

- (1) Restriction enzyme      (2) Plasmid  
(3) Bacteriophage          (4) None of these

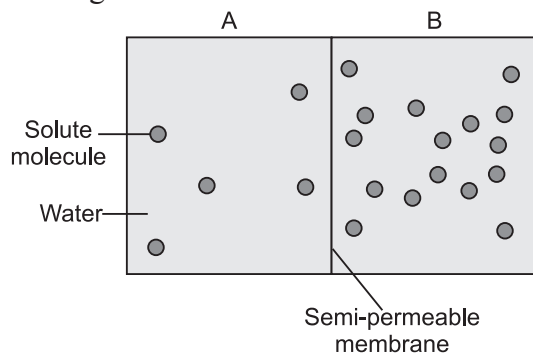
42. Pine, fir, spruce, cedar, larch and cypress are the famous timber-yielding plants of which several also occur widely in the hilly regions of India. All these belong to

- (1) angiosperms              (2) gymnosperms  
(3) monocotyledons        (4) none of these

43. Which of the following hormones is responsible for the emotional states such as fear, anger and tension and a rise in blood pressure and heart rate?

- (1) Somatotrophin          (2) Oxytocin  
(3) Adrenaline              (4) None of these

44. Based on the figure given below, which of the following statements is correct?



- (1) Movement of solvent molecules will take place from chamber B to A.  
(2) Movement of solute will take place from A to B.  
(3) The direction and rate of osmosis depends on both the pressure gradient and concentration gradient.  
(4) None of these

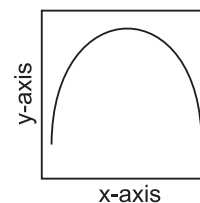
45. The curve given below shows enzymatic activity with relation to three conditions (pH, temperature and substrate concentration). What do both axes (x and y) represent?

- (1) x-axis (Enzymatic activity), y-axis (Temperature)

(2) x-axis (Enzymatic activity),  
y-axis (pH)

(3) x-axis (Temperature),  
y-axis (Enzyme Activity)

(4) None of these



46. In which of the following groups would you place a plant which produces seeds but lack flowers?

- (1) Fungi                      (2) Pteridophytes  
(3) Gymnosperms          (4) None of these

47. One day you wake with a sore throat and a runny nose. Your doctor take a swab from your throat, sends it to a lab, and telephones you the next day to say that antibiotic will not help you get better. Which of the following is the most likely reason for the doctor's statement?

- (1) Having waited a day, it is too late to take an antibiotic.  
(2) You need an antiseptic, not an antibiotic.  
(3) You are infected by a virus.  
(4) None of these

48. All are natural auxins except

- (1) Phenoxy acetic acid  
(2) Indole-3-acetic acid  
(3) NAA  
(4) None of these

49. The yeast that is used in alcohol production and bread making is

- (1) Escherichia coli  
(2) Saccharomyces cerevisiae  
(3) Bacillus subtilis  
(4) None of these

50. People who are suffering from Emphysema have

- (1) slow breathing rate  
(2) rapid breathing rate  
(3) normal breathing rate  
(4) none of these



**END OF THE EXAM**