



**EHF**  
LEARNING FOR LIFE

**EDUHEAL  
FOUNDATION**

**CLASS  
11**

**LEVEL - 1**

**Set A1**

**EHF OLYMPIADS**

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



**EHF**

**NATIONAL INTERACTIVE  
MATHS OLYMPIAD**

Name : .....

Roll No : .....

Class : .....

School : .....



**NATIONAL  
BIOTECHNOLOGY  
OLYMPIAD**



**NATIONAL  
MATHS  
OLYMPIAD**



**NATIONAL  
SCIENCE  
OLYMPIAD**



**INTERNATIONAL  
CYBER  
OLYMPIAD**



**INTERNATIONAL  
ENGLISH  
OLYMPIAD**



**INTERNATIONAL  
GENERAL KNOWLEDGE  
OLYMPIAD**



**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

# MENTAL ABILITY

- In a row 'A' is in the 11th position from the left and 'B' is in the 10th position from the right. If 'A' and 'B' interchange, then 'A' becomes 18th from the left. How many persons are there in the row other than 'A' and 'B'?
  - 27
  - 26
  - 25
  - None of these
- The letters L, M, N, O, P, Q, R, S and T in their order are substituted by nine integers 1 to 9 but not in that order. 4 is assigned to P. The difference between P and T is 5. The difference between N and T is 3. What is the integer assigned to N?
  - 7
  - 5
  - 6
  - None of these
- How many numbers lie between 300 and 500 in which 4 comes only one time?
  - 99
  - 100
  - 110
  - None of these
- In a tournament 14 teams play league matches. If each team plays against every other team once only then how many matches are played?
  - 105
  - 91
  - 85
  - None of these
- A is B's sister. C is B's mother. D is C's father. E is D's mother. Then, how is A related to D?
  - Grandfather
  - Grandmother
  - Granddaughter
  - None of these
- How many pairs of letters in the word 'CHAIRS' have as many letters between them in the word as in the alphabet?
  - 2
  - 3
  - 1
  - None of these
- In a class of 60 where boys are twice that of girls, Ramya ranked 17th from the top. If there are 9 boys ahead of Ramya, how many girls are after her in the rank?
  - 26
  - 12
  - 10
  - None of these
- Fill in the missing letter in the following series—S, V, Y, B, ?
  - C
  - D
  - E
  - None of these
- EIGHTY : GIEYTH :: OUTPUT : ?
  - UTOPTU
  - UOTUPT
  - TUOTUP
  - None of these
- Seismography : Earthquake :: Taseometer : ?
  - Landslides
  - Strains
  - Resistances
  - None of these

# MATHEMATICS

- If the quadratic equation  $px^2 - 2\sqrt{5}p.x + 15 = 0$  has two equal roots, then find the value of  $p$ .
  - 6
  - 3
  - 5
  - None of these
- Solve the following system of equations:
$$15x + 4y = 61$$
$$4x + 15y = 72$$
  - $x = 4, y = 3$
  - $x = 6, y = 1$
  - $x = 3, y = 4$
  - None of these
- The length of a rectangle is 5 cm more than its width and the area is  $50 \text{ cm}^2$ . Find the perimeter.
  - 40 cm
  - 30 cm
  - 20 cm
  - None of these
- Find HCF (26, 91) if LCM (26, 91) is 182.
  - 13
  - 12
  - 14
  - None of these

15. There is a circular path around a sports field. Sonia takes 18 minutes to drive one round of the field, while Ravi takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and go in the same direction. After how many minutes will they meet again at the starting point?
- (1) 15 (2) 36  
(3) 74 (4) None of these
16. The quadratic equation has two equal roots, if
- (1)  $b^2 - 4ac > 0$  (2)  $b^2 - 4ac = 0$   
(3)  $b^2 - 4ac < 0$  (4) None of these.
17. The ages of two friends Ani and Biju differ by 3 years. Ani's father Dharam is twice as old as Ani and Biju is twice as old as his sister Cathy. The ages of Cathy and Dharam differ by 30 years. Find the age of Ani.
- (1) 32 (2) 28  
(3) 21 (4) None of these
18. Write first four terms of the A.P. when the first term  $a = 10$  and the common difference  $d = 10$ .
- (1) 5, 15, 25, 35 (2) 10, 20, 30, and 40  
(3) 7, 17, 27, 37 (4) None of these
19. 30th term of the A.P : 10, 7, 4, ..., is
- (1) 97 (2) 77  
(3) -77 (4) None of these
20. Find the centroid of the triangle whose vertices are (3, -5), (-7, 4), (10, -2).
- (1) (2, -1) (2) (8, 5)  
(3) (3, 4) (4) None of these
21. Find the point on the  $x$ -axis which is equidistant from (2, -5) and (-2, 9).
- (1) (-7, 0) (2) (-6, 0)  
(3) (-8, 0) (4) None of these
22. ABC and BDE are two equilateral triangles such that D is the mid-point of BC. Ratio of the areas of triangles ABC and BDE is
- (1) 2 : 1  
(2) 1 : 2  
(3) 4 : 1  
(4) None of these

23. D, E and F are respectively the mid-points of sides AB, BC and CA of  $\Delta ABC$ . The ratio of the areas of  $\Delta DEF$  and  $\Delta ABC$  is
- (1)  $\frac{1}{4}$  (2)  $\frac{1}{5}$   
(3)  $\frac{1}{7}$  (4) None of these
24. If TP and TQ are two tangents to a circle with centre O so that  $\angle POQ = 110^\circ$ , then  $\angle PTQ$  is equal to
- (1)  $60^\circ$  (2)  $70^\circ$   
(3)  $80^\circ$  (4) None of these
25. Find the area of a sector of a circle with radius 6 cm if angle of the sector is  $60^\circ$ .
- (1)  $132/7$  sq.cm (2) 1327 sq. cm  
(3)  $142/7$  sq. cm (4) None of these
26. 2 cubes each of volume  $64 \text{ cm}^3$  are joined end to end. Find the surface area of the resulting cuboid.
- (1) 150 sq.cm (2) 160 sq.cm  
(3) 170 sq.cm (4) None of these
27. The following table shows the ages of the patients admitted in a hospital during a year.

Ages of patients	5-15	15-25	25-35	35-45	45-55	55-65
Number of patients	6	11	21	23	14	5

Find the mode of the data given above.

- (1) 15.8 (2) 26.8  
(3) 36.8 (4) None of these
28. The following data gives the distribution of total monthly household expenditure of 200 families of a village. Find the mean monthly expenditure.

Expenditure	Number of families
1000-1500	24
1500-2000	40
2000-2500	33
2500-3000	28
3000-3500	30
3500-4000	22
4000-4500	16
4500-5000	7

- (1) 2662.5                      (2) 3662.5  
(3) 4662.5                      (4) None of these
29. If a fair coin is tossed four times, what is the probability of obtaining at most one head?  
(1)  $\frac{1}{16}$                               (2)  $\frac{4}{16}$   
(3)  $\frac{5}{16}$                               (4) None of these
30. A pair of dice are rolled. What is the probability of rolling 10 or less?  
(1)  $\frac{3}{36}$                               (2)  $\frac{33}{36}$   
(3)  $\frac{10}{36}$                               (4) None of these
31. Find the exact value of  $\sec 60^\circ + \cot 45^\circ + \operatorname{cosec} 30^\circ$ .  
(1) 1                                  (2) 2  
(3) 5                                  (4) None of these
32. The area of a right triangle is 50. One of its angles is  $45^\circ$ . Find the length of the hypotenuse of the triangle.  
(1) 10                                (2)  $10\sqrt{2}$   
(3)  $12\sqrt{2}$                         (4) None of these
33. In a right triangle ABC,  $\tan(A) = \frac{3}{4}$ . Find  $\sin(A)$ .  
(1)  $\frac{4}{5}$                                 (2)  $\frac{3}{5}$   
(3)  $\frac{6}{5}$                                 (4) None of these
34. Fact 1: Jessica has four children.  
Fact 2: Two of the children have blue eyes and two of the children have brown eyes.  
Fact 3: Half of the children are girls.
- If the first three statements are facts, which of the following statements must also be a fact?  
I. At least one girl has blue eyes.  
II. Two of the children are boys.  
III. The boys have brown eyes.  
(1) II only                            (2) I and III only  
(3) II and III only                (4) None of these.
35. Fact 1: All hats have brims.  
Fact 2: There are black hats and blue hats.  
Fact 3: Baseball caps are hats.

- If the first three statements are facts, which of the following statements must also be a fact?  
I. All caps have brims.  
II. Some baseball caps are blue.  
III. Baseball caps have no brims.  
(1) I only                            (2) II only  
(3) I, II, and III                (4) None of these
36. The cost of 11 pencils is equal to the selling price of 10 pencils. Find the loss or profit percent, whatever may be the cost of 1 pencil.  
(1) 30 %                            (2) 20%  
(3) 10 %                            (4) None of these
37. Ram covered a distance of 50 miles on his first trip. On a later trip he travelled 300 miles while going three times as fast. His new time compared with the old time was  
(1) three times as much,        (2) twice as much,  
(3) the same,                      (4) None of these
38. What is the centre of a circle whose equation is  $(x - 1)^2 + (y + 3)^2 = 25$ ?  
(1) (-1, 3)  
(2) (3, -1)  
(3) (1, -3)  
(4) None of these
39. If four times of certain number 'a' is ten more than thrice number then equation derived for this statement can be written as  
(1)  $3a = 4a + 10$   
(2)  $3a = 4a - 10$   
(3)  $4a = 3a + 10$   
(4) None of these
40. If a line makes angle  $90^\circ$ ,  $60^\circ$  and  $30^\circ$  with the positive direction of  $x$ ,  $y$  and  $z$ -axis respectively, find its direction cosines.  
(1)  $l = 0, m = \frac{1}{2}, n = \frac{\sqrt{3}}{2}$   
(2)  $l = \frac{2}{3}, m = 0, n = 1$   
(3)  $l = \frac{1}{2}, m = 1, n = 0$   
(4) None of these

# INTERACTIVE SECTION

41. Solve for  $a$ :

$$a^2 + 3 = 0$$

- (1)  $+3, -3$
  - (2)  $-i\sqrt{3}$  and  $+i\sqrt{3}$
  - (3)  $-3i$  and  $+3i$
  - (4) None of these
42. Write a quadratic function with zeroes 8 and  $-7$ .
- (1)  $x^2 + 2x + 7$
  - (2)  $x^2 - 5x + 56$
  - (3)  $x^2 - x - 56$
  - (4) None of these
43. Which function is not one-to-one?
- (1)  $\{(0,1), (1,2), (2,3), (3,4)\}$
  - (2)  $\{(0,0), (1,1), (2,2), (3,3)\}$
  - (3)  $\{(0,1), (1,0), (2,0), (3,2)\}$
  - (4) None of these
44. What is the fourth term in the expansion of  $(3x - 2)^5$ ?
- (1)  $-720x^2$
  - (2)  $-240x$
  - (3)  $720x^2$
  - (4) None of these
45. Fill in the number that makes the polynomial a perfect square quadratic:
- $$a^2 - 28a + (?)$$
- (1) 196
  - (2) 396
  - (3) 296
  - (4) None of these
46. Solve the equation  $8x^3 + 4x^2 - 18x - 9 = 0$  algebraically for all values of  $x$ .
- (1)  $+\frac{3}{2}, -\frac{3}{2}$
  - (2)  $+\frac{3}{5}, -\frac{3}{5}$
  - (3)  $+\frac{2}{7}, -\frac{2}{7}$
  - (4) None of these

47. A bag of cookies contains 6 oatmeal cookies, 5 pecan cookies, and 1 peanut butter cookie. Alisha selects 2 cookies at random. What is the probability that she selected 2 oatmeal cookies?

- (1)  $\frac{5}{22}$
  - (2)  $\frac{5}{11}$
  - (3)  $\frac{6}{11}$
  - (4) None of these
48. In  $\triangle ABC$ ,  $AB = 12$  metres and  $AC = 20$  metres. If the area of the triangle is 77 square metres, find the measure of angle A to the nearest degree.
- (1)  $64^\circ$
  - (2)  $50^\circ$
  - (3)  $40^\circ$
  - (4) None of these
49. The sum of twice a positive integer and four times the reciprocal of the integer is 9. Find the integer.
- (1) 4
  - (2) 5
  - (3) 6
  - (4) None of these
50. If  $\cot(x) = \frac{8}{15}$  and  $0 < x < 90^\circ$ , find the value of  $\sin(x)$ .
- (1)  $\frac{4}{7}$
  - (2)  $\frac{3}{5}$
  - (3)  $\frac{15}{17}$
  - (4) None of these



**END OF THE EXAM**