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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, Cricket, Cyber, NIPO and Biotech.

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

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.**

**EHF
NATIONAL
IIT-PMT
OLYMPIAD**

N I P O

**9
Class**

**A1
Paper
Code**

L E V E L - 1

PHYSICS

1. The heat that is required to melt 5 kg of ice at 0°C to water at 0°C is
(1) 1680 KJ (2) 3360 KJ
(3) 900 KJ (4) None of these
2. The angle of inclination between two plane mirrors to get seven images by multiple reflection is
(1) 60° (2) 45°
(3) 90° (4) None of these
3. The heat generated in a conductor carrying current is proportional to
(1) Resistance
(2) Square of the current
(3) Both (1) and (2)
(4) None of these
4. When temperature increases, the resistance of metals increases. This statement is
(1) True (2) False
(3) Can't say (4) None of these
5. The Kaleidoscope is a toy, based on the principle of
(1) Total internal reflection
(2) Multiple reflection
(3) Refraction
(4) None of these
6. When a conductor cuts magnetic lines of force, an e.m.f. is induced in the conductor. This phenomenon is called
(1) Conduction
(2) Electromagnetic induction
(3) Magnetism
(4) None of these

7. A train of length 200 m travelling at 30 m/sec overtakes another train of length 300 m travelling at 20 m/sec. The time taken by the first train to pass the second is
- (1) 30 sec (2) 10 sec
(3) 50 sec (4) None of these
8. The correct statement from the following is
- (1) A body having zero velocity will not necessarily have zero acceleration
(2) A body having zero velocity will necessarily have zero acceleration
(3) A body having uniform speed can have only uniform acceleration
(4) None of these
9. A man stands at one end of the open truck which can run on frictionless horizontal rails. Initially, the man and the truck are at rest. Man now walks to the other end and stops. Then which of the following is true ?
- (1) the truck moves opposite to the direction of motion of man even after the man ceases to walk
(2) the centre of mass of man and truck remains at the same point throughout the man's walk
(3) the kinetic energy of man and truck are exactly equal throughout man's walk
(4) None of these
10. A man is carrying a block of certain material having density 1000 kg/m^3 equal to that of water, weighing 1 kg in his left hand and bucket containing 10 kg water in right hand. He drops the block in bucket. The weight carried by the man now is
- (1) 9 kg (2) 11 kg
(3) 10 kg (4) None of these
11. Calculate velocity of a particle when its momentum is numerically equal to its K.E.
- (1) 2 m/s (2) Zero
(3) 4m/s (4) None of these
12. Tape recorder records the sound in the form of
- (1) Electrical energy
(2) Magnetic field on the tape
(3) Variable resistance on the tape
(4) None of these
13. The kinetic energy possessed by a body of mass m , moving with a velocity v is equal to $(1/2) mv^2$, provided
- (1) The body moves with velocities comparable to that of light
(2) The body moves with velocities negligible compared to the speed of light
(3) The body moves with velocities greater than that of light
(4) None of these
14. Two spheres are made of same metal and have same mass. One is solid and the other is hollow. When heated to the same temperature, percentage increase in diameter will be
- (1) More for hollow sphere
(2) Less for hollow sphere
(3) Same for both (4) None of these
15. A block of copper of 0.1 kg is placed for sufficient time in a vessel containing boiling water so that the block is at 100°C . It is then immediately transferred to another vessel containing 0.25 kg of water at 20°C . The temperature of water rises and attains a steady state at 23°C . What would be the specific heat capacity of copper ?
- (1) $0.507 \text{ kJ/kg } ^\circ\text{C}$ (2) $1.407 \text{ kJ/kg } ^\circ\text{C}$
(3) $0.407 \text{ kJ/kg } ^\circ\text{C}$ (4) None of these

CHEMISTRY

16. Equivalent weights can be determined by
- (1) Redox method
(2) Electrophoresis method
(3) Metal displacement method
(4) None of these
17. A and B are two elements of atomic numbers 13 and 8 respectively which combine to form a compound. The formula is
- (1) A_2B_2 (2) A_2B
(3) A_2B_3 (4) None of these
18. The number of periods and groups in the long form of the periodic table are respectively
- (1) 7 and 9 (2) 8 and 18
(3) 7 and 18 (4) None of these
19. Which of the following is a defect in the Mendeleev's periodic table ?
- (1) The position of the alkali metals
(2) The position of transition metals
(3) The position of isotopes
(4) None of these

20. Among O, C, F, Cl, Br the correct order of increasing radii is
 (1) F, O, C, Cl, Br (2) F, C, O, Cl, Br
 (3) F, Cl, Br, O, C (4) None of these
21. When dry sulphur dioxide and dry chlorine react, they form
 (1) H_2SO_4 and HCl (2) SO_3 and HOCl
 (3) SO_2Cl_2 (4) None of these
22. When chlorine is passed through hot and concentrated caustic soda, a mixture of the product is
 (1) NaCl and bleaching powder
 (2) NaCl and sodium hypochlorite
 (3) NaCl and sodium chlorate
 (4) None of these
23. When an element forms an oxide in which oxygen is 20% of the oxide by mass, the equivalent mass of the element will be
 (1) 32 (2) 40
 (3) 60 (4) None of these
24. If molecular mass and atomic mass of sulphur are 256 and 32 respectively, its atomicity is
 (1) 2 (2) 4
 (3) 8 (4) None of these
25. The oxide of nitrogen which has a faint sweet smell is
 (1) NO (2) N_2O
 (3) NO_2 (4) None of these
26. Equivalent weight of NaHCO_3 is
 (1) 84 (2) 42
 (3) 48 (4) None of these
27. The correct order of electrochemical series is
 (1) $\text{Li} > \text{Mg} > \text{Na} > \text{Al} > \text{Cu}$
 (2) $\text{Na} > \text{Li} > \text{Mg} > \text{Cu} > \text{Al}$
 (3) $\text{Li} > \text{Na} > \text{Mg} > \text{Al} > \text{Cu}$
 (4) None of these
28. Dry cell finds use in
 (1) rail coaches (2) calculators
 (3) automobiles (4) None of these
29. When NO is absorbed by a strong solution of ferrous sulphate _____ is formed which is _____ in colour.
 (1) $\text{FeSO}_3 \cdot \text{NO}$, brown
 (2) $\text{FeSO}_4 \cdot \text{NO}$, brown
 (3) $\text{Fe}_3\text{SO}_4 \cdot \text{NO}$, green
 (4) None of these
30. Equivalent weight of oxalic acid is
 (1) 45 (2) 32
 (3) 29 (4) None of these

MATHEMATICS

31. A person borrowed ₹ 5,500 from a moneylender at the rate of 24% per annum. He lent this amount to his friend at the rate of 36% per annum. After two years, he collected the amount from his friend and paid back the amount due to the moneylender. The amount he thus earned was
 (1) ₹ 8140 (2) ₹ 6820
 (3) ₹ 1320 (4) None of these
32. If the sides of a triangle are in the ratio of 5 : 12 : 13 and its perimeter is 60 m, then the area of the triangle (in cm^2) is
 (1) 140 (2) 121
 (3) 120 (4) None of these
33. A is twice as good a workman as B and together they finish a piece of work in 14 days. In how many days, can it be done by each separately ?
 (1) A - 14 days, B - 28 days
 (2) A - 22 days, B - 44 days
 (3) A - 21 days, B - 42 days
 (4) None of these
34. A bag contains ₹ 90 in coins. If coins of 50 paise, 25 paise and 10 paise are in the ratio of 2 : 3 : 5, then the number of 25-paise coins in the bag are
 (1) 80 (2) 100
 (3) 120 (4) None of these
35. In what proportion must a man mix juice at ₹ 11 a litre with juice at ₹ 6 a litre so that the mixture may be worth ₹ 8 a litre ?
 (1) 2:3 (2) 3 : 2
 (3) 5 : 7 (4) None of these
36. A student gets the following percentages in an examination. English-46%, Biology-58%, Mathematics-67%, Physics-53% and chemistry-72%. It was suggested that he will be given double weightage of his marks in English and Mathematics than in other subjects. What is the arithmetic mean of marks?
 (1) 57.4 (2) 59.4
 (3) 58.4 (4) None of these

37. In a parallelogram ABCD, the bisectors of consecutive angles A and B intersect at P. Then ΔAPB is equal to

- (1) 60° (2) 75°
(3) 90° (4) None of these

38. Two numbers are 50% and 60% less than a third number. How much percentage is the first number to the second number?

- (1) 110% (2) 125%
(3) 112% (4) None of these

39. The speed of a boat in still water is 10 km/hour. If it can travel 26 km downstream and 14 km upstream in the same time, then the speed of the stream is

- (1) 2 km/hr (2) 2.2 km/hr
(3) 3 km/hr (4) None of these

40. The number of rational numbers between two given rational numbers is

- (1) Infinite (2) Finite
(3) Two (4) None of these

BIOLOGY

41. Protoplasm consists of

- (1) Only living organelles
(2) Non-living structures
(3) Both living and dead structures
(4) None of these

42. Which of the following is not true ?

- (1) Animal cells do not possess plastid
(2) Plant cells have large vacuole
(3) Plant cells have plasmalemma unlike animal cell
(4) None of these

43. Membranes occur in

- (1) Chromosomes, chloroplasts and starch grains
(2) Chromosomes, nuclei and mitochondria
(3) Cytoplasm, chloroplasts and mitochondria
(4) None of these

44. The pores on nuclear membrane provide for

- (1) Leakage of DNA into the cytoplasm

- (2) Leakage of nucleolus into the cytoplasm
(3) Transport of macromolecules in and out of the nucleus
(4) None of these

45. Parenchyma cells having chloroplasts constitute

- (1) Chlorophyllous parenchyma
(2) Collenchyma
(3) Chlorenchyma
(4) None of these

46. Monocot leaves are characterised by

- (1) Lack of differentiation of palisade and spongy tissue
(2) Permanently opened stomata
(3) Bulliform cells absent
(4) None of these

47. If all the bacteria and fungi of the world are destroyed then

- (1) All living things will become immortal and there will be no disease left.
(2) We shall be unable to obtain any antibiotics.
(3) The world will become packed with dead bodies and excretions of all kinds of living organisms.
(4) None of these

48. Which of these are viral diseases?

- (1) Influenza, mumps and measles
(2) Smallpox and chickenpox
(3) both (1) and (2)
(4) None of these

49. Compositated manure is formed from

- (1) Farm refuse and household refuse
(2) Rotted vegetables and animal refuse
(3) Organic wastes from which biogas is extracted
(4) None of these

50. Major drawback of DDT as a pesticide is that

- (1) Organisms at once develop resistance to it
(2) It is significantly less effective than other pesticides
(3) It is not easily and rapidly degraded in nature
(4) None of these



END OF THE EXAM