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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.

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*# 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
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N I P O

**10
Class**

**A1
Paper
Code**

L E V E L - 1

PHYSICS

1. Light waves are

- (1) Mechanical waves
- (2) Electromagnetic waves
- (3) Travel with the same velocity in all media
- (4) None of these

2. Two plane mirrors form 9 images by multiple reflection. The angle of inclination is

- (1) 90°
- (2) 60°
- (3) 36°
- (4) None of these

3. When an object is placed at the distance 2F of a convex lens, the image is formed

- (1) At 2F
- (2) Between F and 2F
- (3) At F
- (4) None of these

4. The capacitance of a parallel plate capacitor

- (1) Is proportional to the area of the plate

(2) Is inversely proportional to the distance between the plates

(3) Both (1) and (2)

(4) None of these

5. When the distance between two magnetic poles doubles, the force between them also doubles. This statement is

- (1) True
- (2) False
- (3) Can't say
- (4) None of these

6. For a concave mirror to form a magnified real image, the object must be placed between its and.....

- (1) Principal focus ; centre of curvature
- (2) Principal focus; radius of curvature
- (3) Centre of curvature and focal length
- (4) None of these

7. A convex lens is a lens whereas a concave lens is a lens.
- (1) Diverging ; diverging
 - (2) Diverging ; converging
 - (3) Converging ; diverging
 - (4) None of these
8. The number of images formed, when an object is placed between two parallel mirrors will be
- (1) Four
 - (2) Three
 - (3) Infinite
 - (4) None of these
9. The optical instrument used for looking objects which cannot be seen directly due to obstruction is known as
- (1) Periscope
 - (2) Kaleidoscope
 - (3) Microscope
 - (4) None of these
10. The sum of the focal lengths of the objective and the eye piece in case of an astronomical telescope is equal to
- (1) The length of the telescope
 - (2) Half the length of the telescope
 - (3) Double the length of telescope
 - (4) None of these
11. The objective of a compound microscope is essentially
- (1) A concave lens of small focal length and small aperture
 - (2) Convex lens of small focal length and small aperture
 - (3) Convex lens of large focal length and large aperture
 - (4) None of these
12. If the length of the wire is doubled and its cross-section is also doubled, then
- (1) The resistance will decrease four times
 - (2) The resistance will increase four times
 - (3) The resistance will remain unchanged
 - (4) None of these
13. The coil of a sensitive moving coil galvanometer swings too far on both sides. This movement can be quickly stopped by
- (1) Earthing the case of galvanometer
 - (2) Holding the magnet near the coil
 - (3) Connecting a short length of copper wire across the ends of the coil
 - (4) None of these
14. Nuclear energy is released in fission since binding energy per nucleon is
- (1) Sometimes larger and sometimes smaller

- (2) Larger for fission fragments than for parent nucleus
- (3) Same for fission fragments and nucleus
- (4) None of these

15. A man walks for 5 kms in North, then 2 kms in East, then 1 km in North and finally, 6 km in East. How far is he from his starting point ?

- (1) 10 kms
- (2) 18 kms
- (3) 16 kms
- (4) None of these

CHEMISTRY

16. Bone charcoal contains the residue

- (1) 60% calcium phosphate
- (2) Calcium carbonate
- (3) 60% calcium phosphate and calcium carbonate
- (4) None of these

17. Copper is mainly extracted from

- (1) Malachite
- (2) Cuprite
- (3) Copper pyrites
- (4) None of these

18. In the Kipp's apparatus, for the preparation of H_2S ferrous sulphide is used in the form of

- (1) Sticks
- (2) Chips
- (3) Granules
- (4) None of these

19. German silver is an alloy of

- (1) Cu + Zn
- (2) Cu + Zn + Ni
- (3) Cu + Sn + Zn
- (4) None of these

20. Sodium amalgam is used as a

- (1) Oxidising agent
- (2) Reducing agent
- (3) Dehydrating agent
- (4) None of these

21. Friction match head contains

- (1) Phosphorus trisulphide
- (2) Phosphorus disulphide
- (3) Phosphorus tetrasulphide
- (4) None of these

22. A small quantity of is added to render the glass clear, colourless and lustrous.

- (1) Bakelite
- (2) Naphthalene
- (3) Arsenous oxide
- (4) None of these

23. Dimethyl ether is isomeric with.....

- (1) Ethyl amine (2) Ethyl alcohol
(3) Diethyl triamine (4) None of these

24. According to Bronsted Lowry concept, the relative strengths of the bases CH_3COO^- , OH^- and Cl^- are in the order :

- (1) $\text{OH}^- > \text{CH}_3\text{COO}^- > \text{Cl}^-$
(2) $\text{Cl}^- > \text{OH}^- > \text{CH}_3\text{COO}^-$
(3) $\text{CH}_3\text{COO}^- > \text{OH}^- > \text{Cl}^-$
(4) None of these

25. Which one of the following elements is extracted commercially by the electrolysis of an aqueous solution of one of its compounds ?

- (1) Na (2) Al
(3) Br (4) None of these

26. A sample of water drawn from a well became milky after boiling. It most probably contains

- (1) dissolved magnesium carbonate
(2) dissolved calcium hydrogen carbonate
(3) dissolved sodium chloride
(4) None of these

27. Solvay's process is used for preparing washing soda. It cannot be used for the preparation of K_2CO_3 because

- (1) K_2CO_3 is not stable under ordinary conditions
(2) KHCO_3 is highly soluble in water and hence, it cannot be filtered out
(3) Potassium is the most reactive metal
(4) None of these

28. When a few drops of bromine water are added to acetylene, its brown colour is decolorised due to formation of

- (1) Ethyl chloride
(2) Propyl bromide
(3) Acetylene dibromide
(4) None of these

29. Ethylene, on ozonolysis gives ozonide, which, on hydrolysis gives

- (1) Acetaldehyde (2) Glycol
(3) Formaldehyde (4) None of these

30. High alumina cement can be prepared by heating a mixture of bauxite and

- (1) Tri-calcium aluminate
(2) Dicalcium silicate
(3) Limestone (4) None of these

MATHEMATICS

31. If one of the roots of the equation $3x^2 - 9x = kx - k$ is 2, then the value of k is

- (1) 4 (2) 3
(3) -6 (4) None of these

32. Three pipes A, B and C can fill a cistern in 4, 8 and 12 hours respectively, while another pipe D can alone empty it in 10 hours. Which one of the following arrangements will fill the cistern in the least possible time ?

- (1) A, C and D are opened
(2) B, C and D are opened
(3) A and D are opened
(4) None of these

33. A garrison of 2000 men have provisions for 54 days. At the end of 15 days, a reinforcement arrives and it is found that now, the provisions would last for 20 more days. What is the strength of the enforcement ?

- (1) 1100 men (2) 1800 men
(3) 1900 men (4) None of these

34. If n is a natural number, then $n(n + 1)$ is

- (1) Always divisible by 2
(2) Never divisible by 2
(3) Always a prime number
(4) None of these

35. A 25 feet long ladder is placed against a vertical wall of a building. The foot of the ladder is 7 feet from the base of the building. If the top of the ladder slips by 4 feet, then the foot of the ladder will slide by a distance of

- (1) 8 feet (2) 9 feet
(3) 12 feet (4) None of these

36. Inside a circle, whose radius is 13 cms, there is a point M at a distance of 5 cm from the centre of the circle. A chord AB, whose length is 25 cm, is drawn through the point M. The lengths of the segments into which the chord is divided, by point M, are

- (1) 12 cm, 13 cm (2) 11cm, 14cm
(3) 16 cm, 9 cm (4) None of these

37. A cross-section of a canal is a trapezium in shape. If the canal is 8 m wide at the top and 6 m wide at the bottom, the area of cross-section being 644 m^2 , then the height of the canal is

- (1) 108 m (2) 96 m
(3) 92 m (4) None of these

38. The average grade of 15 students of a class is 68. The average grade of 20 students of another class is 65. Find the combined average of both the classes ?

- (1) 66.9 (2) 66.3
(3) 66.2 (4) None of these

39. The milk of water ratio in a 16 litre mixture is 5 : 3. How much milk should be added to make this ratio as 2 : 1?

- (1) 6 litre (2) 2 litre
(3) 5 litre (4) None of these

40. P and Q are the mid-points of sides AB and BC respectively of triangle ABC. The triangle is right angled at B. Which of the following is correct?

- (1) $AQ^2 + CP^2 = AC^2/4$
(2) $AQ^2 + CP^2 = AC^2$
(3) $AQ^2 + CP^2 = 5AC^2/4$
(4) None of these

BIOLOGY

41. Vivipary in plants means

- (1) Development of fruit after the fertilized seed is buried
(2) Germination of seeds in crevices of the stem where some soil is deposited
(3) Germination of seeds inside the fruit when it is still on parent tree
(4) None of these

42. Which is the most logical sequence with reference to life cycle of angiosperms ?

- (1) Germination, endosperm formation, seed dispersal, double fertilization
(2) Cleavage, fertilization, grafting, fruit formation
(3) Pollination, fertilization, seed formation, germination
(4) None of these

43. When an oak leaf stoma is opening more widely, the most likely process involved is

- (1) Water molecules are entering the adjacent guard cells
(2) Auxins are accumulating in the guard cells
(3) The atmosphere outside the stoma is becoming less humid
(4) None of these

44. 'Hunger signs' in plants are

- (1) Symptoms due to lesser water absorption in plants
(2) Symptoms due to poor photosynthesis in plants
(3) Deficiency symptoms of particular mineral nutrients
(4) None of these

45. If the tip of a seedling is cut off, growth as well as bending ceases because it hampers

- (1) Perception of light stimulus
(2) Transpiration
(3) Respiration
(4) None of these

46. Phytohormones are

- (1) Hormones regulating growth from seed to adulthood
(2) Hormones regulating secondary growth
(3) Growth regulators synthesized by plants and influencing physiological processes
(4) None of these

47. The practice of subjecting seeds to low temperature for a period of time in order to cause growth and flowering during summer season is called

- (1) Wintering (2) Vernalization
(3) Devernalization (4) None of these

48. Water absorbed by roots reach the top of a tall tree by means of

- (1) Root pressure (2) Capillary force
(3) Transpiration-pull and cohesion of water molecules
(4) None of these

49. During ventricular systole

- (1) Oxygenated blood is pumped into the pulmonary artery and deoxygenated blood is pumped into the artery
(2) Oxygenated blood is pumped into the aorta and deoxygenated blood is pumped into the pulmonary vein
(3) Oxygenated blood is pumped into the aorta and deoxygenated blood is pumped into the pulmonary artery
(4) None of these

50. Hypothalamus is the principal intermediary between

- (1) Nervous system and chromatophores
(2) Endocrine system and chromatophores
(3) Nervous system and endocrine system
(4) None of these



END OF THE EXAM