

# Jharkhand PECE 2023 Question Paper

## Physics

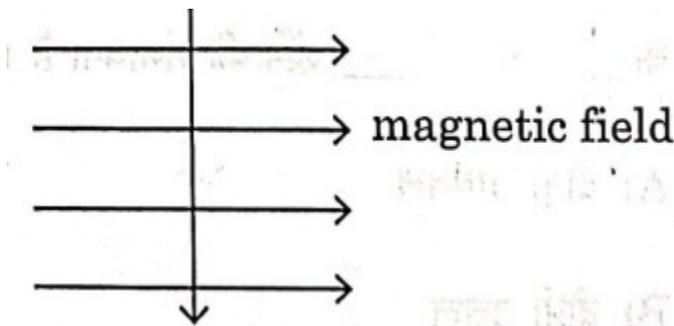
1. A thin spherical mirror and a thin spherical lens have a focal length of  $-15\text{cm}$ . The mirror and the lens are likely to be

- Both concave
- Both convex
- The mirror is concave and the lens is convex
- The mirror is convex and the lens is concave

2. An object is placed at a distance of  $10\text{ cm}$  from a convex mirror of focal length  $15\text{ cm}$ . The magnification is

- 1.667
- 0.6
- 10
- 1.5

3. An electron enters a magnetic field at right angles to it, as shown in the figure. The direction of force acting on the electron will be



- To the right
- To the left
- Out of the plane of the paper
- Into the plane of the paper

4. The phenomenon of electromagnetic induction is

- The process of charging a body
- The process of generating magnetic field due to a current passing through a coil
- Producing induced current in a coil due to relative motion between the magnet and the coil
- The process of rotating a coil of an electric motor

5. The swimming pool appears to be less deep than it actually is. Which of the following phenomena is responsible for this?
- Reflection of light
  - Refraction of light
  - Dispersion of light
  - Total internal reflection
6. Which colour is refracted the most when white light is dispersed from a prism?
- Violet
  - Red
  - Yellow
  - Orange
7. Work of 14J is done to move 2 C charge between two points on a conducting wire. What is the potential difference between the two points?
- 28 V
  - 14 V
  - 7 V
  - 3.5 V
8. According to Fleming's left hand rule, the fore finger is pointed towards the direction of
- Electric current
  - Magnetic field
  - Force exerted
  - Motion of the conductor
9. The least distance of distinct vision for a young adult with normal vision is about
- 25 m
  - 2.5 cm
  - 25 cm
  - 2.5 m
10. Electrical resistivity of a given metallic wire depends upon
- Its length
  - Its thickness
  - Its shape
  - Nature of the material

11. A soft iron bar is introduced inside a current carrying solenoid. The magnetic field inside a solenoid
- Decrease
  - Will increase
  - Will become zero
  - Will remain unaffected
12. A 2cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 10 cm. The distance of the object from the lens is 15 cm. The image distance is
- 20 cm
  - 15 cm
  - 30 cm
  - 45 cm
13. A person needs a lens of power -5.5 D for correcting his distant vision. What is the focal length of the lens required for correcting distant vision?
- 0.181 m
  - - 0.181 m
  - 5.5 m
  - -5.5 m
14. The AC supply to the house is of 220 V, 50 Hz one of the wires in this supply is with red insulation called as
- Live wire
  - Neutral wire
  - Earth wire
  - None of the above
15. The safety device used for protecting the circuits due to short circuiting is
- Resistor
  - Fuse
  - Motor
  - Generator

## Chemistry

1. In Clark's method calculated amount of ----- is added to hard water
- Lime
  - Washing Soda

- Soda Lime
- Slaked Lime

2. Acetylation of salicylic acid produces

- Picric acid
- Aspirin
- Cumene
- Salicylaldehyde

3. Aldehydes which do not have an  $\alpha$ -hydrogen atom, undergo self oxidation and reduction reaction on heating with

- Concentrated acid
- Concentrated alkali
- Dilute acid
- aqNaOH

4. Gabriel synthesis is used for the preparation of

- Primary amines
- Primary alcohols
- Secondary amines
- Secondary alcohols

5. The sodium fusion extract is acidified with acetic acid and lead acetate is added to it. A black precipitate of lead sulphide indicates the presence of

- Phosphorous
- Nitrogen
- Sulphur
- Halogen

6. For any solution the partial vapour pressure of each volatile component in the solution is directly proportional to its

- Mole fraction
- Molarity
- Volume
- Normality

7. Two solutions having same osmotic pressure at a given temperature are called

- Hypotonic
- Hypertonic
- Hypsotonic

● Isotonic Solutions

8. The nitrogen-containing organic compound, when heated with copper oxide in an atmosphere of carbon dioxide, yields free nitrogen in addition to carbon dioxide and water. This method is

- Dumas method
- Charle's method
- Stephen's method
- Sandmeyer's method

9. Hydrogenation of vegetable oils using ----- as catalyst gives edible fats

- Lead
- Palladium
- Tin
- Nickel

10. Neoprene is formed by the free radical polymerisation is

- Isoprene
- Chloroprene
- 1,3 butadiene
- Acrylonitrile

11. ----- is used in the manufacture of paints and lacquers

- Bakelite
- Glyptal
- PHBV
- Polystyrene

12. Excess -----in drinking water can cause disease such as blue baby syndrome

- Lead
- Fluoride
- Sulphate
- Nitrate

13. The temperature at which a real gas obeys ideal gas law over an appreciable range of pressure is called ----- temperature.

- Charle
- Boyle
- Dalton

● Critical

14. ----- is the molarity of NaOH in the solution prepared by dissolving its 4g in enough water to form 250ml of the solution

● 0.4m

● 4 m

● 40 m

● 2 m

15. Ejection of electrons from metal surface when radiation strikes it, is called

● Black body radiation

● Photoelectric effect

● Radiation effect

● Black body absorption

## Mathematics

1. The 7th term of AP is 40. Then the sum of its first 13 terms is

● 520

● 53

● 2080

● 1040

2. The number of words that can be formed from the letters of the word ARTICLE so that vowels occupy even places is

● 574 36 754 144

●

●

●

3. Equation of the straight line making equal intercepts on the axes and passing through (2,4) is

●  $4x - y - 4 = 0$

●  $2x + y - 8 = 0$

●  $X + y - 6 = 0$

●  $X + 2y - 10 = 0$

4. A stone is thrown up vertically and the height  $x$  feet reached by it in time  $t$  seconds is given by  $x = 80t - 16t^2$ . The stone reaches the max height in time ----- second?

- 2
- 2.5
- 3
- 3.5

5. In a railway compartment there are 6 seats. The number of ways 6 passengers can occupy those seats is

- 30 36 120 720
- 
- 
- 

6. The distance between foci is 16, eccentricity is  $\frac{1}{2}$  then length of major axis of the ellipse is

- 64
- 8
- 32
- 16

7. In a class of 60 students, 25 play cricket, 20 play tennis, and 10 play both the games. Then the number of students who play neither of the games is

- 45 0 25 35
- 
- 
- 

8. Equation of the line bisecting perpendicularly the segment joining the points (-4,6) and (8,8) is

- $Y = 7$
- $6x + y - 19 = 0$
- $X + 2y - 7 = 0$
- $6x + 2y - 19 = 0$

9. The maximum of the function  $f(x) = 3 \cos x - 4 \sin x$  is

- 2
- 3
- 4
- 5

10. The 7th and 13th term of an AP is 34 and 64 respectively, then 18th term is

- 87
- 88
- 89
- 90

11. The point at which the tangent to the curve  $y = 2x^2 - x + 1$  is parallel to  $y = 3x + 9$  is

- (1,2)
- (2,1)
- (-2,1)
- (3,9)

12. The function of  $f(x) = 2x^3 - 15x^2 + 36x + 4$  is maximum at  $x =$

- 4
- 3
- 2
- 0

13.  $A = (1,2)$ ,  $B = (0,1)$  then  $A \times B =$

- $\{(1,0) (1,1) (2,0) (2,1)\}$
- $\{(1,1) (1,2) (0,1) (0,2)\}$
- $\{(1,0)(2,1)\}$  None of
- these