



**Q.No.8** In a nuclear reactor cadmium radius.

- |                            |                           |     |
|----------------------------|---------------------------|-----|
| a) generate the neutrons   | b) slow down the neutrons | (1) |
| c) accelerate the neutrons | d) Absorbs the neutrons   |     |

**Q.No.9** Choose the correct relation between the transistor parameter  $\alpha$  and  $\beta$ . (1)

- |                                  |                                  |
|----------------------------------|----------------------------------|
| a) $\beta = 1 - \alpha / \alpha$ | b) $\beta = \alpha / 1 - \alpha$ |
| c) $\beta = 1 + \alpha / \alpha$ | d) $\beta = \alpha / 1 + \alpha$ |

**Q.No.10** A device which converts one form of energy into another form is known as.

- |                |               |     |
|----------------|---------------|-----|
| a) Transmitter | b) Receiver   | (1) |
| c) Amplifier   | d) Transducer |     |

**Q.No.11** The least distance of distinct vision for a normal human eye is \_\_\_\_

- |        |          |     |
|--------|----------|-----|
| a) 25m | b) 0.25m | (1) |
| c) 1m  | d) 2.5m  |     |

**Q.No.12** Hugen's wave theory of light could not explain \_\_\_\_

- |                         |                 |     |
|-------------------------|-----------------|-----|
| a) diffraction          | b) interference | (1) |
| c) photoelectric effect | d) polarisation |     |

**Q.No.13** What is meant by quantization of charge? Can a body have a charge of  $0.8 \times 10^{-19} \text{ C}$ ? (2)

**Q.No.14** What are eddy current. How can they be minimized? (2)

**Q.No.15** State and explain Maxwell modification of Ampere's circuital Law.

**OR** (2)

What are E.M. waves? What is the source of E.M. waves?

**Q.No.16** Derive an expression for de-broglie wavelength of an electron accelerated from rest through a potential difference  $V$  and hence prove that  $\lambda = 12.27 / \sqrt{V} \text{ \AA}$ . (2)

**Q.No.17** Write the truth table and logic symbol for "NOR" gate.

**OR** (2)

Explain the working of full wave rectifier with diagram

**Q.No.18** An object of size 3.00cm is placed 14cm in front of a concave lens of focal length 21cm.

Describe the image produced by the lens. What happens if the object is moved farther from the lens? (2)

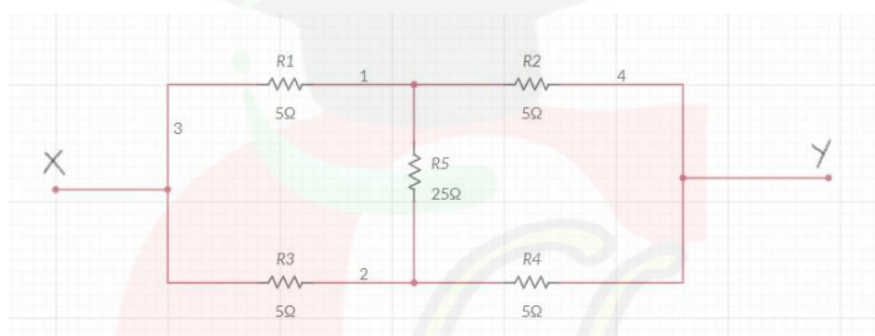
**OR**

Derive mirror formula for a concave mirror when real image is formed?

**Q.No.19** State the working principle of potentiometer, with the help of circuit diagram, describe the method to find the internal resistance of cells. (3)

**Q.No.20** a) State Kirchoff's Law in electricity.

b) Calculate equivalent resistance between X and Y (3)



**Q.No.21** State Ampere's circuital law. Using this law find an expression for magnetic field due to a long straight conductor carrying current  $I$ .

**OR**

a) State Biot-Savart Law.

b) A long straight wire carries a current of 35A. What is the magnitude of the field? At a point 20cm from the wire. (3)

**Q.No.22** What are magnetic lines of force? Explain why magnetic lines of force cannot intersect each other. (3)

**Q.No.23** a) What do you understand by total Internal Reflection? Write essential conditions for it.

b) A tank is filled with water to a height of 12.5cm. The apparent depth of a needle lying at the bottom of tank is measured by a microscope to be 9.4cm. What is the refraction index of water? (3)

**Q.No.24** State postulates of Bohr's model of H atom, on the basis of this find radius of Hydrogen atom in the inner most orbit.

**OR** (3)

Define Mass defect. Calculate the binding energy per nucleons of  ${}_{26}\text{Fe}^{56}$ , Given mass of  ${}_{26}\text{Fe}^{56}$  is 55.934949amu, mass of neutron is 1.008665amu, mass of proton is 1.007825amu.

**Q.No.25** With the help of a circuit diagram, explain the working of CE-npn transistor as an amplifier.

**OR** (3)

Explain forward and reverse biasing. How is a Zener diode fabricated to work as voltage regular.

**Q.No.26** Discuss the different modes of propagation of E.M. waves. (3)

**Q.No.27** What is electric dipole and dipole moment? Drive an expression for electric field intensity at any point on the axial line of an electric dipole.

**OR** (4)

Define electrical capacitance. Drive an expression for the capacitance of a parallel plate capacitor filled with dielectric slab.

**Q.No.28** What is an A.C Generator? With the help of a labelled diagram, explain the principle, construction and working of an A.C generator. (4)

**Q.No.29** What do you mean by diffraction of light? Explain diffraction at a single slit and deduce an expression for width of central maxima.

**OR** (4)

What is an astronomical telescope? Explain its principle with ray diagram and derive an expression for its magnifying power when the final image is formed at infinity.

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