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CUET 2023 Physics

1. A converging lens is used to form image on a screen. When the lower half of the lens is covered by an opaque screen then, the correct statements are:

- (A) Intensity of Image will decrease.
- (B) Intensity of Image will increase.
- (C) Complete Image will be formed.
- (D) Half the Image will disappear.

Choose the correct answer from the options given below.

- (a) (A), (B) and (C) Only
- (b) (A), (C) and (D) Only
- (c) (A) and (C) Only
- (d) (B) and (C) Only

2. In Young's double slit experiment, the ratio of slit widths is 4: 1. The intensity ratio in the interference pattern would be:

- (a) 1:2 (b) 1:3 (c) 9:1 (d) 1:9

3. The instantaneous magnetic flux linked with a coil is given by $\phi = (15t^3 - 100t^2 + 40) \text{Wb}$. The emf induced in the coil at time $t = 1 \text{ s}$ is:

- (a) +150 V (c) -150 V
- (b) -155 V (d) +155 v

4. Two antennas A and B have maximum line of sight range $R_{AB} = 45.5 \text{ km}$. If the height of

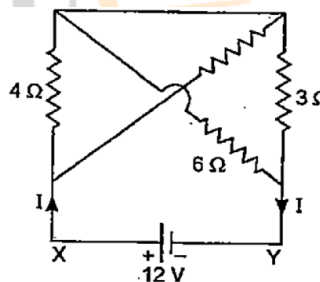
antenna A is 32 m then the height of antenna B is: (Given radius of the earth is = 6400 km)

- (a) 25 m (b) 100 m (c) 50 m (d) 75 m

5. When strong magnetic field is applied on a stationary electron, the electron:

- (a) moves in the direction of the field.
- (b) moves in opposite direction of the field.
- (c) starts spinning.
- (d) remains stationary.

6. The current I flowing in the circuit is



- (a) 2.5 A (b) 2.4 A (c) 2.2 A (d) 2.0 A

7. Match List-I with List-II.

List-I (Scientist)	List-II (Phenomenon)
(A) Rutherford	(I) Nuclear Model of atom



(B)A.H. Becquerel	(II) Plum-Pudding Model of atom
(C) Niels Bohr	(III) Radioactivity
(D)J.J. Thomson	(IV) Hydrogen atom mode

Choose the correct answer from the options given below:

- (a) (A)-(I), (B)-(III), (C)-(IV), (D)-(II)
- (b) (A)-(III), (B)-(I), (C)-(II), (D)-(IV)
- (c) (A)-(IV), (B)-(II), (C)-(III), (D)-(I)
- (d) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

8. A carrier wave of peak voltage 24 V is used to transmit a message signal. What should be the peak voltage of the modulating signal in order to have a modulation index of 70%?

- (a) 16.8 V (c) 18 V
- (b) 2.9 V (d) 16.8×10^2 v

9. When a potential difference is applied across the ends of a conductor, the electric field exists:

- (a) inside the conductor.
- (b) outside the conductor.
- (c) both inside and outside the conductor.
- (d) no where.

10. Huygen's wave theory of light could not explain the phenomenon of:

- (a) interference
- (b) diffraction
- (c) rectilinear propagation of light
- (d) photoelectric effect

11. The de Broglie wavelength of an electron having kinetic energy 56 eV is:

- (a) 0.022 nm (c) 0.164 nm
- (b) 16.4 Å (d) 0.0164 nm

12. The following that is not transported by Electromagnetic waves is:

- (a) Momentum (c) Charge
- (b) Energy (d) Information.

13. The current in a circuit having constant resistance is tripled. The power dissipation will become :

- (a) 6 times (c) 3/2 times
- (b) 9 times (d) 1/2 times

14. Match List - I with List - II.

List-I (EM waves)	List-II (Wavelength in Range)
(A) Light	(I) 1 mm to 10^{-3} nm
(B) Infra-red	(II) 700 nm to 400 nm

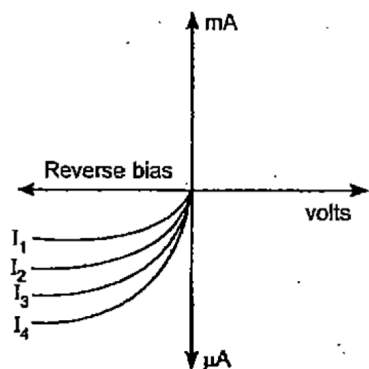


(C) X-rays	(III) 400 nm to 1 nm
(D). UV rays	(IV) 1 mm to 700 nm

Choose the correct answer from the options given below:

- (a) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
- (b) (A)-(II), (B)-(IV), (C)-(1), (D)-(II)
- (c) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)
- (d) (A)-(IV), (B)-(I), (C)-(III), (D)-(II)

15. For a photodiode, the I-V characteristics for different illumination intensities $I_1, I_2, I_3,$ and I_4 were plotted. Which of the following is correct?



- (a) $I_1 > I_2 > I_3 > I_4$
- (b) $I_4 > I_3 > I_2 > I_1$
- (c) $I_2 > I_1 > I_3 > I_4$
- (d) $I_4 > I_3 > I_1 > I_2$

16. A positively charged glass rod attracts an object. The object must be:

- (a) negatively charged

- (b) neutral
- (c) either negatively charged or neutral
- (d) a magnet

17. When a current of 5 A flows through an ammeter it gives full deflection. The resistance of ammeter is 20Ω . If the same ammeter is to be used for measuring a maximum current of 10 A, then the ammeter must be connected to a resistance of:

- (a) 40Ω in series
- (b) 40Ω in parallel
- (c) 20Ω in series
- (d) 20Ω in parallel

18. The correct sequence A, B, C, D, E with reference to atomic spectra series is:

- (A) Lyman series $\frac{1}{\lambda} = R\left(\frac{1}{A^2} - \frac{1}{n^2}\right)$
- (B) Balmer series $\frac{1}{\lambda} = R\left(\frac{1}{B^2} - \frac{1}{n^2}\right)$
- (C) Pfund series $\frac{1}{\lambda} = R\left(\frac{1}{C^2} - \frac{1}{n^2}\right)$
- (D) Bracket series $\frac{1}{\lambda} = R\left(\frac{1}{D^2} - \frac{1}{n^2}\right)$
- (E) Paschen series $\frac{1}{\lambda} = R\left(\frac{1}{E^2} - \frac{1}{n^2}\right)$

Choose the correct answer from the options given below:

- (a) (A), (B), (C), (D), (E)
- (b) (B), (A), (E), (C), (D)
- (c) (A), (B), (E), (D), (C)
- (d) (E), (D), (C), (B), (A)



19. A radioactive isotope has half-life of 'K' years. How long will it take, so that activity reduces to 6.25% of its original value?

- (a) 5 K (c) 3 K
(b) 4 K (d) 2 K

20. The linear magnifications of the object in the conjugate positions of a convex lens are 4 and 2, respectively. The distance between the conjugate positions is 40 cm. This convex lens of glass ($\mu = 1.5$) is immersed in water ($\mu = 1.33$). The new focal length of convex lens in water is:

- (a) 40 cm (c) 60 cm
(b) 20 cm (d) 80 cm

21. The angle of dip at a location in Southern India is about 18° . Which of the following is correct for dip angle in Britain?

- (A) Dip angle will be greater in Britain than in India
(C) Nearer the place to the poles, lesser is the dip angle.
(D) Nearer the place to the poles, more is the dip angle.
(E) Dip angle is also called the angle of declination. Choose the correct answer from the options given below:
(a) (A) and (D) only
(b) (B) and (C) only

- (c) (A), (C) and (E) only
(d) (D) and (E) only

22. Wavelength of matter wave is independent of:

- (a) momentum (c) velocity
(b) charge (d) mass

23. Match List - I with List - II.

List - I	List - II
(A) Electric potential (V) due to a single charge	(I) $\propto r^\circ$
(B) Electric flux due to a positive point charge through sphere of radius r	(II) $\propto \frac{1}{r^2}$
(C) Electric intensity (E) due to a point charge	(III) $\propto \frac{1}{r}$
(D) Electric intensity (E) due to dipole	(IV) $\propto \frac{1}{r^3}$

Choose the correct answer from the options given below:

- (a) (A)-(IV), (B)-(II), (C)-(III), (D)-(I)
(b) (A)-(III), (B)-(I), (C)-(II), (D)-(IV)
(c) (A)-(III), (B)-(IV), (C)-(I), (D)-(I)
(d) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

24. According to Einstein's photoelectric equation

- (a) $K_{max} = hv - \phi_0$
(b) $hv = K_{max} - \phi_0$



(c) $K_{max} = h\nu + \phi_0$

(d) $\phi_0 = K_{max} + h\nu$

(Where all symbols have their usual meaning)

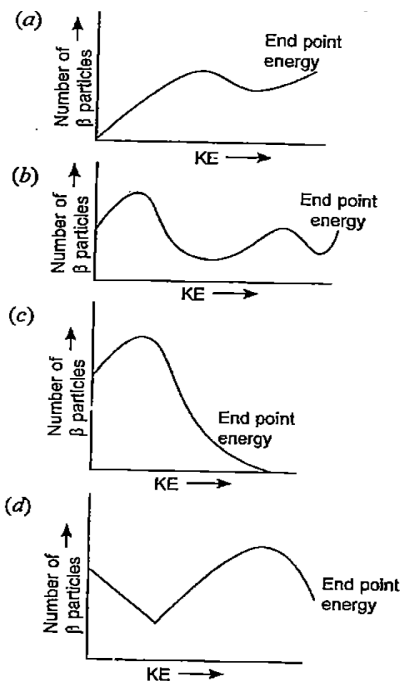
25. An uncharged capacitor is connected to a battery. How much amount of energy supplied by the battery is lost as heat while charging the capacitor?

- (a) $\frac{1}{4}QV$ (c) $\frac{1}{2}QV$
- (b) zero (d) $\frac{1}{3}QV$

26. A wire of length 4 m carrying current I A is bent in the form of a circle. Its magnetic moment will be :

- (a) $\frac{IL}{4\pi}$
- (b) $\frac{m^2}{4\pi}$
- (c) $\frac{I^2 L^2}{4\pi}$
- (d) $\frac{LY^2}{4\pi}$

27. The graph showing the distribution of kinetic energy of electrons emitted during beta decay would be:



28. The number of electrons in one coulomb of electric charge is :

- (a) 6.25×10^{-18} (c) 1.6×10^{-19}
- (b) 6.25×10^{-18} (d) $1.6 \times 10^{+19}$

29. Match List-I with List-II.

List - I (Electronic Device)	List - II (Application)
(A) Zener diode	(I) Rectifier
(B) Capacitor	(II) Amplifier
(C) Transistor	(III) Voltage regulator
(D) p-n junction diode	(IV) Filter circuit

Choose the correct answer from the options given below:

- (a) (A)-(I), (B)-(II), (C)-(II), (D)-(IV)
- (b) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)



- (c) (A)-(III), (B)-(IV), (C)-(II), (D)-(I)
 (d) (A)-(IV), (B)-(II), (C)-(I), (D)-(II)

30. In a potentiometer arrangement for comparing emf of two cells, it was found that a cell of emf 1.25 V gives a balance point at 0.35 m length of the wire. On replacing the cell by another cell, the balance point shifted to 0.63 m. The emf of the second cell is:

- (a) 1.5 V (c) 1.75 V
 (b) 0.69 V (d) 2.25 V

31. A closely wound circular coil of radius 10 cm carries a current of 6.4 A. If the number of turns in coil are 10 then magnetic moment of this coil is:

- (a) 2.0096 A m² (c) 40.192 A m²
 (b) 20.096 A m² (d) 0.2096 A m²

32. A transformer has 4000 turns in primary and 100 turns in secondary coils. The primary coil is connected to a 240 V and secondary to a bulb of 1.2 N resistance. The current in the bulb is;

- (a) 0.50 A (c) 0.20 A
 (b) 0.25 A (d) 5.00 A

33. Arrange the following elements of a generalised communication system in the sequential order:

- (A) Channel
 (B) Information Source

- (C) Transmitter
 (D) Receiver
 (E) User Of Information

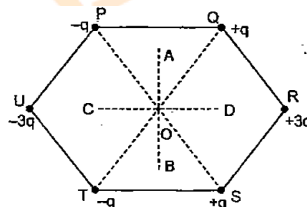
Choose the correct answer from the options given below:

- (a) (B), (D), (A), (C), (E)
 (b) (E), (D), (C), (B), (A)
 (c) (A), (B), (C), (D), (E)
 (d) (B), (C), (A), (D), (E)

34. Six point charges are kept at the vertices of a regular hexagon of side a and centre O is shown.

The correct statement(s) are :

$$\left(\text{Given, } K = \frac{1}{4\pi\epsilon_0} \frac{q}{a^2} \right)$$



- (A) Net electric field at O is 8 K along OU.
 (B) Electric field at O will be zero if all charges are of same magnitude and sign.
 (C) Electric potential at all points on the line AB is same.
 (D) Electric potential at all points on the line CD is same,
 (E) Electric potential at centre O is zero.

Choose the correct answer from the options given below:

- (a) (A) and (B) only
 (b) (A), (B) and (E) only



(c) (B), (C) and (E) only

(d) (A), (B), (C) and (E) only

35. If v is the frequency of ac mains, then the frequency of sonometer wire at resonance is:

- (a) $v/2$ (c) $2v$
- (b) v (d) $4v$

36. Two sources are producing waves as given in the options below. Which two sources are called coherent?

- (a) of same velocity
- (b) of equal wavelength
- (c) having a constant phase difference
- (d) having wavefront of same shape

37. A battery with potential V across it is connected to a combination of two identical resistors, and then has current i through it. What are the potential differences across and the current through either resistor if the resistors are connected in series?

- (a) $V, i/2$ (c) $V/2, i$
- (b) $V/2, i/2$ (d) V, i

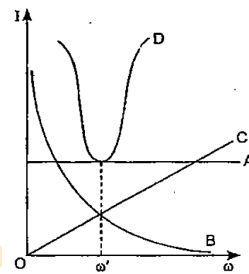
38. The speed of an electromagnetic wave in a medium of dielectric constant 2.25 and relative permeability 4 is:

- (a) $3 \times 10^8 \text{ m s}^{-1}$ (c) 10^8 m s^{-1}
- (b) $9 \times 10^8 \text{ m s}^{-1}$ (d) $1.33 \times 10^8 \text{ m s}^{-1}$

39. The radii of curvature of the faces of a double convex lens of focal length 12 cm made up of glass ($\mu = 1.5$) are 10 cm and 'p' cm respectively. The value of p is:

- (a) 10 cm (c) 30 cm
- (b) 15 cm (d) 20 cm

40. For an LCR circuit ;



- (i) C and D represent R and Z, respectively.
- (ii) A, B, C, D represent R, X_c , X, and Z, respectively.
- (iii) C and D represent Z and R, respectively.
- (iv) A and B represent R and X, respectively.
- (v) For $\omega = \omega'$, the phase difference between current and voltage is zero.

(R, Z, X_c , X, ω , ω' have their usual meaning)

Choose the correct answer from the options given below:

- (a) (i), (ii) only
- (c) (ii), (v) only
- (b) (ii), (iv) only
- (d) (iii), (v) only



41. A metal foil of negligible thickness is introduced between two parallel plates of a capacitor at the center. The new capacitance of the capacitor would be:

- (a) C (c) $\frac{1}{2}C$
- (b) 4C (d) 2C

42. The essential condition for total internal reflection to occur is;

- (a) angle of incidence $i >$ critical angle i_c
- (b) angle of incidence $i <$ critical angle i_c
- (c) angle of incidence i critical angle i_c
- (d) angle of incidence $i = 90^\circ$

43. The correct statement given below are:

- (A) $x = 1 + \mu_r$
- (B) $\mu_r = 1 + x$
- (C) $B = \mu_0(H + M)$
- (D) $H = B_0\mu_0$
- (E) $B_0 = \mu_0H$

Here x = magnetic susceptibility

μ_r = Relative magnetic permeability

B = Magnetic field

M = Magnetisation

H = Magnetic Intensity

μ_0 = Magnetic permeability

Choose the correct answer from the options given below:

- (a) (B) only
- (b) (A), (B) and (C) only

- (c) (B), (C) and (E) only
- (d) (B), (C) and (D) only

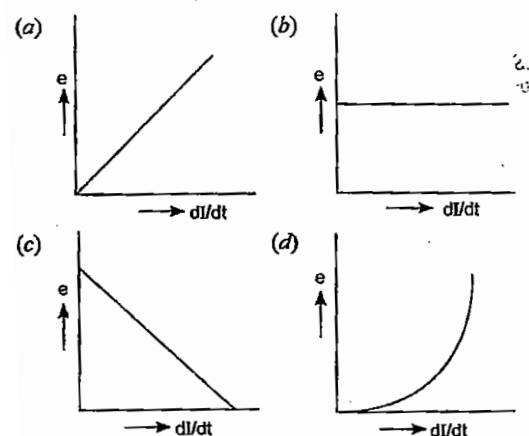
44. What will be the half life of a radioactive isotope whose $\frac{1}{16}$ th of initial amount remains unchanged after 2 hours?

- (a) 60 min (c) 30 min
- (b) 45 min (d) 15 min

45. If the forward voltage in a p-n junction diode is increased, the width of the depletion region:

- (a) increases (c) fluctuates
- (b) decreases (d) no change

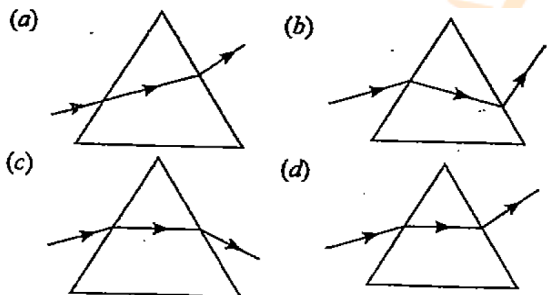
46. The current flowing through an inductor of self inductance L is continuously increasing. The correct graph, showing the variation of induced emf(e) versus $\frac{di}{dt}$ is



47. Which of the following statements best describe the temperature dependence of resistances of Cu and Si in the temperature range 27° to 127°C .

- (a) Linear decrease for both Cu and Si
- (b) Linear increase for both Cu and Si
- (c) Linear decrease for Cu and exponential increase for Si
- (d) Linear increase for Cu and exponential decrease for Si

48. A student has drawn the following courses of rays through a glass prism. The one which represents the position of minimum deviation is:



49. Three charges $+q$, $-2q$ and $4q$ are placed on the vertices of an equilateral triangle of 0.2 m . The electrostatic potential energy of the system (Take $q = 10\text{ }\mu\text{C}$) is:

9

- (a) $-6.3 \times 10^{-3}\text{ J}$
- (b) $-9.0 \times 10^{-3}\text{ J}$
- (c) -27 J
- (d) $+27\text{ J}$

50. Two solenoids of equal number of turns having their lengths and radii in the same ratio $1 : 3$. The ratio of their self inductances $L_1 : L_2$ will be:

- (a) 1:27
- (b) 3:1
- (c) 1:9
- (d) 9:1



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