

ONE MARK - PRE PUBLIC EXAMINATION
FULL PORTION - I (2023)

28/12/2023

Mark: 40

Time: 1 hr

XII - A, B
physics

I. Answer all the questions:

- According to quark model, number of up and down quarks in photon is.
 (a). 2, 1, (b). 1, 2 (c). 3, 1 (d). 1, 3
- The value of gyro-magnetic ratio
 (a). $8.78 \times 10^{10} \text{ c kg}^{-1}$ (b). $7.87 \times 10^{10} \text{ c kg}^{-1}$ (c). $8.78 \times 10^{10} \text{ c kg}^{-1}$
 (d). $1.6 \times 10^{-19} \text{ c kg}^{-1}$
- Non-polar molecule
 (a). H_2O (b). NeO (c). HCl (d). CO_2
- If the nuclear radius of ^{27}Al is 3.6 fermi, the approximate nuclear radius of ^{64}Cu in fermi is
 (a). 2.4 (b). 4.8 (c). 1.2 (d). 3.6
- A person can see clearly objects only when they lie between 50 cm and 400 cm from his eyes. In order to increase the maximum distance of distinct vision to infinity, the type and power of the correcting lens, the person has to use will be
 (a). convex, +2.25 D (b). concave, -0.25 D, (c). concave, -0.2 D (d). convex, +0.15 D.
- A charge q is placed at the centre of the line joining two equal charges Q . The system of the three charges will be in equilibrium, if q is equal to
 (a). $-\frac{Q}{4}$ (b). $\frac{Q}{2}$ (c). $-\frac{Q}{4}$ (d). $\frac{Q}{4}$

7. The ratio of wavelengths of the last line of Balmer series and the last line of Lyman series is
 (a). 1 (b). 3 (c). 0.5 (d). 4
8. The blue colour of the sky is due to the phenomenon of
 (a). dispersion (b). refraction (c). reflection (d). scattering
9. The energy of a photon of wave length λ is
 (a). $\frac{hc}{\lambda}$ (b). $hc\lambda$ (c). λ/hc (d). $h\lambda/c$
10. The ratio of the radii of the nuclei ${}_{13}^{27}\text{Al}$ and ${}_{52}^{125}\text{Te}$ is approximately
 (a). 6:5 (b). 3:5 (c). 40:177 (d). 14:73
11. A dipole moment p is placed in uniform electric field E , then torque acting on it is given by
 (a). $\tau = p \cdot E$ (b). $\tau = p \times E$ (c). $\tau = p \# E$ (d). $\tau = p - E$
12. In which of the following devices, the eddy current effect is not used.
 (a). electric heater (b). induction stove (c). eddy current brake (d). electro magnetic damping
13. In millikan oil drop experiment, the direction of viscous force.
 (a). acts always downward (b). acts always upward (c). acts opposite to direction of movement

13. acts along the direction of movement of oil drop.
14. In a stepup transformer input voltage is 220 V and output voltage is 11000V. The ratio of number of turns in primary and secondary is
 (a). 1:50 (b). 50:1 (c). 25:1 (d). 1:25
15. which of the following spectrum is used to study about structure of molecules?
 (a). Band emission spectrum (b). continuous emission spectrum
 (c). Line emission spectrum (d). Band absorption spectrum.
16. n equal capacitors of capacitance C is connected in series. The effective capacitance is
 (a). $\frac{1}{n}C$ (b). nC (c). $\frac{C}{n}$ (d). C
17. when an electron jumps from M shell to K shell, the spectral line is
 (a). K_{α} line (b). K_{β} line (c). L_{α} line
 (d). L_{β} line
18. A rod has 5 cm length and 3 μ C charge then linear charge density of the rod.
 (a). $6 \times 10^{-5} \text{ cm}^{-1}$ (b). $15 \times 10^{-5} \text{ cm}^{-1}$ (c). $1.66 \times 10^{-5} \text{ cm}^{-1}$
 (d). $8 \times 10^{-5} \text{ cm}^{-1}$
19. The correct relationship between the two current gains α and β in a transistor is
 (a). $\beta = \frac{\alpha}{1+\alpha}$ (b). $\alpha = \frac{\beta}{1+\beta}$ (c). $\alpha = \frac{1+\beta}{\beta}$
 (d). $\alpha = \frac{\beta}{1+\beta}$

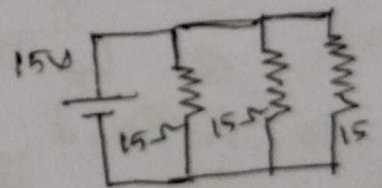
20. For a real object, which of the following can produce a real image?
 (a). plane mirror (b). concave mirror (c). convex mirror (d). concave mirror. lens.

21. ${}_{16}^{32}\text{S} + {}_0^1\text{n} \rightarrow \text{X} + {}_2^4\text{He}$, Here X is
 (a). ${}_{16}^{28}\text{S}$ (b). ${}_{7}^{14}\text{N}$ (c). ${}_{16}^{29}\text{S}$ (d). ${}_{14}^{29}\text{Si}$

22. If 4A electric current passes through a conductor, the number of electrons flowing it in one second is
 (a). 2.5×10^{20} (b). 2.5×10^{19} (c). 1.25×10^{13}
 (d). 6×10^8

23. The energy and momentum of a photon is given by $E = h\nu$ and $p = \frac{h}{\lambda}$. The velocity of the photon will be $v =$
 (a). $\frac{E}{p}$ (b). Ep (c). $(\frac{E}{p})^2$ (d). $(\frac{E}{p})^{1/2}$

24. The current passing through each resistor in the circuit is
 (a). 4A (b). 1A (c). 2A (d). 3A



25. A particle of mass 3×10^{-6} g has the same wavelength as an electron moving with a velocity $6 \times 10^5 \text{ m s}^{-1}$. The velocity of particle is
 (a). $9 \times 10^{-2} \text{ m s}^{-1}$ (b). $1.82 \times 10^{-18} \text{ m s}^{-1}$ (c). $1.82 \times 10^{-15} \text{ m s}^{-1}$
 (d). $3 \times 10^{-31} \text{ m s}^{-1}$

26. If V_g, V_x, V_m are speeds of Gamma rays, X-rays and microwaves respectively in vacuum then

- (a) $V_g < V_x < V_m$ (b) $V_g > V_x > V_m$ (c) $V_m > V_g > V_x$
 (d) $V_g = V_x = V_m$

27. A ray of light gets refracted into the air medium from crown glass of refractive index 1.541. If angle of incidence is equal to the critical angle 40.5° , then the angle of refraction will be

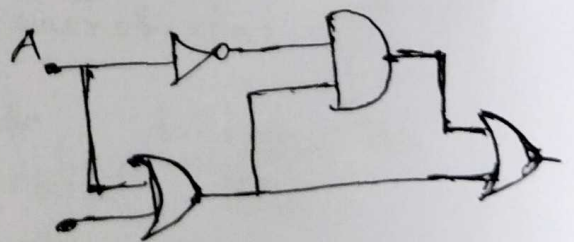
- (a) equal to the critical angle
 (b) lesser than the critical angle
 (c) equal to 90°
 (d) greater than critical angle.

28. The momentum of a photon of energy 1 MeV in kgms^{-1} is

- (a) 10^{-22} (b) 0.33×10^{-24} (c) 7×10^{-24}
 (d) 5×10^{-22}

29. The output boolean expression for the given circuit is

- (a) AB (b) $A+B$ (c) $\bar{A}+B$
 (d) $A+\bar{B}$



30. A ray of light strikes a glass plate at an angle 60° . If the reflected and refracted rays are perpendicular to each other,

the refractive index of the glass is,

- (a) $\sqrt{3}$ (b) $\frac{3}{2}$ (c) $\sqrt{\frac{3}{2}}$ (d) 2

31. when a soap bubble is given an electric charge

- (a) it contracts (b) it expands
 (c) its size remains the same
 (d) it expands (or) contracts depending upon whether the charge is positive (or) negative

32. magnitude of drift velocity per unit electric field is

- (a) current density (b) current (c) resistivity
 (d) mobility

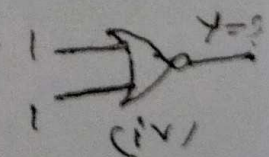
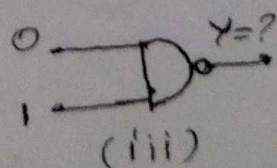
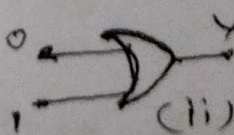
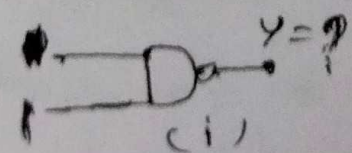
33. A magnet is placed in a non-uniform magnetic field, it experiences.

- (a) A force but not a torque (b) a torque but not a force
 (c) a force and a torque
 (d) neither a force nor a torque

34. Soap bubble looks coloured due to

- (a) dispersion (b) reflection (c) interference
 (d) none of these.

35. which of the following gates (figure) will have an output of 1?



- (a) (iv)

- (b) (i)

- (c) (ii)

- (d) (iii)

36. When computer Key boards are pressed, the separation between the plates

(a). Decreases leading to an increase in the capacitance

(b). increases leading to an increase in the capacitance

(c). Decrease leading to an decrease in the capacitance

(d). increases leading to an decrease in capacitance

37. The force experienced by a conductor carrying current placed parallel to a magnetic field is

(a). Maximum

(b). minimum

(c). zero

(d). decrease

38. Find the heat energy produced in a resistance of $10\ \Omega$ when 5 A current flows through it for 5 minutes.

(a). 1250 J

(b). 75000 J

(c). 75 J

(d). 7500 J

39. The reactance offered by 300 mH inductor to an AC supply of frequency 50 Hz is

(a). $1046\ \Omega$

(b). $94.2\ \Omega$

(c). $9420\ \Omega$

(d). $104.6\ \Omega$

40. which phenomena ~~does~~ ^{can} effect could not explain electromagnetic wave theory

(a). photo electric effect (b). Compton effect

(c). Seeman effect (d). a and b

XII - FULL PORTION

ONE MARK ANSWER & KEY

1. 2, 1 . a

2. a. $8.78 \times 10^{10} \text{ C Kg}^{-1}$

3. CO_2 . d

4. b. 4. 8

5. b. concave , -0.25D

6. c. $-\frac{Q}{4}$

7. d. 4

8. d. scattering

9. a. hc/λ

10. 3:5 . a

11. $\tau = P \times E$. b

12. a. electric heater

13. c. acts opposite to direction of movement of oil drop.

14. a. 1:50

15. a. Band emission spectrum

16. e. c/n

17. b. K_{β} line

18. a. $6 \times 10^{-5} \text{ cm}^{-1}$

19. b. $\alpha = \beta / (1 + \beta)$

20. b. concave mirror

21. d. Si

14

22. a. 2.5×10^{20}
23. a. ϵ_p
24. d. 3A
25. b. $1.82 \times 10^{-18} \text{ m s}^{-1}$
26. d. $V_g = V_x = V_m$
27. c. equal to 90°
28. d. $5 \times 10^{-22} \text{ kg m s}^{-1}$
29. b. A+B
30. a. $\sqrt{3}$
31. d. it expands
32. d. mobility
33. c. a force and a torque
34. c. interference
35. d. (iii)
36. a. decreases loading to an increase in the capacitance
37. c. zero
38. b. 75000 J
39. b. 94.2μ
40. d. a and b

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