# Sethu Bhaskara Matric. Higher Secondary School

## Scoring key - Half-Yearly 2019

## Std. XII PHYSICS

### Part - I

Choose the correct answer

1. b) $\frac{V_a}{V_b}$
2. b) $-10$ V
3. d) $V_g = V_x = V_m$
4. a) AND gate
5. c) uniformly charged infinite plane
6. a) increase by 3 times
7. d) 1 A
8. a) $\frac{eV_r}{2}$
9. a) 1
10. c) equal to $90^\circ$
11. a) 30 KJ
12. b) $45^\circ$
13. b) $3.6 \times 10^{-15}$ m
14. a) 25m
15. d) voltage regulator

### Part - II

16. correct definition $\longrightarrow$ 2m
17. Any 2 difference $\longrightarrow$ 2m
18. $I' = I_0 \cos^2\theta \longrightarrow 1$m

$I' = \left(\frac{I}{2}\right) \cos^2 30^\circ = \frac{I}{2}\left(\frac{\sqrt{3}}{2}\right)^2 = I\frac{3}{8}$ $\longrightarrow 1$ m

$I' = \frac{3}{8} I$

19. correct definition $\longrightarrow$ 2m

20. $\alpha = \frac{I_C}{I_E}$, $I_C = \alpha I_E$
$= 0.95 \times 1 \times 10^{-3}$ } → 1 m
$I_C = 0.95\ mA$

$I_E = I_C + I_B$
$I_B = I_E - I_C$
$= 1 \times 10^{-3} - 0.95 \times 10^{-3}$ } → 1 m
$I_B = 0.05 \times 10^{-3}\ A$
(or) $I_B = 50\ \mu A$

21. Any two difference → 2 m

22. The frequency range over which the baseband signals (or) the information signals such as voice, music, picture etc is transmitted is known as bandwidth.

23. The current which comes into play in the region in which the electric field and the electric flux are changing with time.

24. Stone will reach first → 1 m
Metal ball falls through magnetic field of earth eddy currents are produced in it which opposes its motion → 1 m

## Part – III

25. Advantage any 3 → 1½ mark
Limitation 3 → 1½ mark

26. $B_{tot} = 4 \times \frac{\mu_0 I}{4\pi\, l/2} (\sin\phi_1 + \sin\phi_2)$ → 1 m

$= \frac{4 \times 4\pi \times 10^{-7} \times 1.5}{4\pi \times 0.25} \left(\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}}\right)$ → 1 m

$= \frac{4 \times 0.3}{5} \times \frac{2}{\sqrt{2}} \times 10^{-5}$

$B_{tot} = 3.4 \times 10^{-6}\ T$ → 1 m

27. Photodiode → correct statement → 1 m
Any two application → 2 m

28. Diagram → 1 m
Construction → 2 m
Derivation → 1 m
$R = 2f$ → 2 m

29. Diagram → 2 m
Construction → 2 m
4 equations → 1 m
Derivation upto $\frac{P}{Q} = \frac{R}{S}$ → 1 m

30. Any 3 laws → 3 mark.

31. $\frac{N}{N_0} = \left(\frac{1}{2}\right)^n$ → 1 m
Substitution → 1 m
5 : 4 → 1 m

32 case (i) → 1 m
case (ii) → 1 m
case (iii) → 1 m

33. a) $E = \frac{2P}{4\pi\epsilon_0 r^3}$ → 2 m
Substitution → 2 m
$4.5 \times 10^4$ NC$^{-1}$ → 2 m

b) $E = \frac{2P}{4\pi\epsilon_0 r^3}$ → 2 m
Substitution → 2 m
$4.5 \times 10^4$ NC$^{-1}$ → 2 m

## Part – IV

34) a) principle → 1 m
Construction → 1 m
Diagram → 1 m
Working → 2 m

b) Diagram → 1 m
$V = \frac{q}{4\pi\epsilon_0}\left(\frac{1}{r_1} - \frac{1}{r_2}\right)$ → 1 m

Derivation of $\frac{1}{r_1}$ → 2 m

Derivation of $\frac{1}{r_2}$ → 2 m

$V = \frac{1}{4\pi\varepsilon_0} \frac{P\cos\theta}{r^2}$ → 1 m

Special case → 1 m

35 a) Diagram → 1m, construction → 1 m, working → 3 m

b) Diagram → 1, construction → 2 m, $\sin i_c = \frac{R}{\sqrt{d^2+R^2}}$ → 1m

upto $R = d\sqrt{\frac{n_2^2}{(n_1^2 - n_2^2)}}$ → 2 m

$R = \frac{d}{\sqrt{n^2-1}}$ → 2 m

36. a) Diagram → 2 m, construction → 2 m,

Deriving $I = neAv_d$ → 2 m

Deriving upto $J = \sigma E$ → 2 m

b) 4 diagrams → 1m, construction → 1m

upto $I_m = \frac{V_m}{\sqrt{R^2+(X_L - X_C)^2}}$ → 1½m

$\tan\phi = \frac{X_L - X_C}{R}$ → 1½m

37. a) statement → 1 m, construction → 1 m

Deriving $N = N_0 e^{-\lambda t}$ → 2m

Graph with explanation → 1m.

b) Diagram → 1½, Graph → 2 m

Construction → 1 m positive & negative half cycle → 1 m

efficiency → 2 m

38 a) Diagram → 1m

construction → 2 m

upto $m_o = \frac{L}{f_o}$ → 1 m, $m_e = 1 + \frac{D}{f_e}$ → 1 m

$m = m_o m_e = \left(\frac{L}{f_o}\right)\left(\frac{D}{f_e}\right)$ → 1m, $m_e = \frac{D}{f_e}$ → 2 m

b) Spectrum → 1 m

Emission spectrum → 1 m

3 types → 3 × 1 = 3m

# Handling Teachers

1. Annie Mathew
2. P. Murugesan
3. T. Brindha Zeby
4. MANIKANDAN.M

16/12/14

5 copies of Xerox