

**PUNJAB BOARD CLASS 12 PHYSICS (C)  
PREVIOUS YEAR PAPER- 2018**

SS  
2038

ANNUAL EXAMINATION SYSTEM

PHYSICS (Theory)

(Common for Science and Agriculture Groups)

(Punjabi, Hindi and English Versions)

(Evening Session)

Time allowed : Three hours

Maximum marks : 70

(English Version)

- Note :**
- (i) You must write the subject-code/paper-code **052/C** in the box provided on the title page of your answer-book.
  - (ii) Make sure that the answer-book contains 30 pages (including title page) and are properly serialised as soon as you receive it.
  - (iii) Question/s attempted after leaving blank page/s in the answer-book would not be evaluated.
  - (iv) Use of unprogrammable calculator / log tables is allowed.
  - (v) Answer should be to the point and supported by relevant formulas / law / principle / diagram.
  - (vi) Question Nos. **1 to 8** are of one mark each.
  - (vii) Question Nos. **9 to 16** are of two marks each.
  - (viii) Question Nos. **17 to 23** are of four marks each. There will be internal choice in any two questions.
  - (ix) Question Nos. **24 to 26** are of six marks each. There will be internal choice in them.
  - (x) Punjabi and Hindi versions of questions are translations of English version. Since translation is based on approximations, so in the case of any confusion consider English version to be correct.

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1. What is the de-Broglie wavelength of an electron beam accelerated through a potential difference of 25V ? 1
2. What are diamagnetic substances ? 1
3. For alloys the value of temperature coefficient of resistance is very high. (True / False) 1
4. One atomic mass unit is equal to  $1.67 \times 10^{-27}$  g. (Yes / No) 1
5. Give the basic function of antenna. 1
6. Choose the correct option :  
Electrical conductivity of a semi conductor –  
(i) decreases with rise in its temperature.  
(ii) increases with rise in its temperature.  
(iii) does not changes with temperature.  
(iv) first decreases and then increases with rise in temperature. 1
7. \_\_\_\_\_ was the first scientist who produced electromagnetic waves in a laboratory. 1
8. Define resonant frequency of LCR series circuit. 1
9. Why does the thickness of depletion layer of pn-junction increases in reverse biasing ? Draw the circuit diagram of reverse biasing. 2
10. What is total internal reflection of light ? What are the two essential conditions for total internal reflection to take place ?  $1, \frac{1}{2}, \frac{1}{2}$
11. How the eye of a person suffering from myopia can be corrected ? Explain with the help of ray diagram. 2
12. Explain ground wave propagation. 2

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13. A solenoid of length 50cm, having 100 turns carries a current of 2.5A. Find the magnetic field (B), (a) in the interior of the solenoid, (b) at one end of the solenoid. Given  $\mu_0 = 4\pi \times 10^{-7} \text{ Wb A}^{-1} \text{ m}^{-1}$ . 2
14. Write two uses of infrared rays. 2
15. A capacitor of unknown value and an inductor of 0.1H and a resistor of  $10\Omega$  are connected in series to a 220V, 50Hz ac source. It is found that the power factor of circuit is unity. Calculate the capacitance of capacitor and maximum amplitude of current. 2
16. A wire with an area of cross-section as  $10\text{mm}^2$  has a resistance of  $5\Omega$ , when a potential difference across its ends is 25V. Calculate the drift velocity of electrons. Given the number density of electrons as  $5 \times 10^{20}$  electrons per cubic meter ( $\text{e/m}^{-3}$ ). 2
17. (a) State the laws of photo electric effect.  
(b) Name a phenomenon which illustrates the particle nature of light. 3,1
18. With the help of ray diagram, describe the construction, working of a compound microscope when the final image is formed at least distance of distinct vision ( $D = 25\text{cm}$ ). Derive an expression for its magnifying power (m). 1,1,1,1
- or
- (a) Two lenses of powers +15D and  $-5\text{D}$  are in contact with each other. What is the focal length of combination ?
- (b) In the Young's double slit experiment, two slits 0.125mm apart are illuminated by light of wavelength  $4500\text{\AA}$ . The screen is 1m away from the plane of the slits. Find the separation between second bright fringes on both sides of central maxima. 1,3

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19. Derive an expression for the energy stored in a capacitor. In what form is the energy stored in a charged capacitor? 3,1
20. (a) Write the truth table of AND gate. 1  
(b) What is rectifier? Explain the working of p-n junction diode as a full-wave rectifier with the help of suitable circuit diagram. 1,1,1
- or
- (a) A common emitter (CE) transistor has a current gain of 100. If emitter current is 8.08 mA, find the base and collector current. 2  
(b) In a sample of semi conductor mobilities of electrons and holes are  $24 \times 10^3 \text{ cm}^2 \text{ V}^{-1} \text{ S}^{-1}$  and  $0.2 \times 10^3 \text{ cm}^2 \text{ V}^{-1} \text{ S}^{-1}$  respectively. If the density of electrons is  $0.8 \times 10^{14} \text{ cm}^{-3}$  and that of holes is  $0.4 \times 10^{14} \text{ cm}^{-3}$ . Find the nature of semi-conductor and its conductivity. 2
21. What is radioactivity? State radioactive decay law and show that it is exponential in nature. 1,1,2
22. With the help of labelled diagram, describe the principle, construction and working of a transformer. 1,1,1,1
23. Define e.m.f. of a cell. How can you compare the emf of two cells using potentiometer? 1,3
24. (a) What is the essential condition for diffraction of light to occur? 1  
(b) What is polarisation of light? Explain polarisation of light by reflection with the suitable diagram and hence derive Brewster's law. 1,2,2
- or
- (a) Why does the sky appear blue? 1  
(b) With the help of suitable diagram, sign conventions and assumptions, derive Lens Maker's formula for a convex lens. 1,1,1,2
25. (a) Why two electric lines of force/field cannot intersect each other? 1  
(b) State Coulomb's law, explain its vector form and define S.I unit of electric charge. State two limitations of Coulomb's law. 1,2,1,1

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or

- (a) What is the shape of equipotential surface for a given point charge  $q$ . 1
- (b) State Gauss's theorem. With the help of diagram, derive an expression for the electric field intensity due to uniformly charged thin spherical shell at a point (i) outside (ii) inside (iii) on the surface of the spherical shell. 1,4
26. (a) Write SI unit of magnetic dipole moment. 1
- (b) What is magnetic dipole ? Derive an expression for magnetic field intensity at a point on the equatorial line of a bar magnet. 1,4

or

- (a) How can a galvanometer be converted into an ammeter ? 1
- (b) Derive an expression for the force acting on a current carrying straight conductor kept in a uniform magnetic field. Name the rule used to determine the direction of this force. Under what condition this force is maximum and zero ? 3,1,1