

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

Roll No.

052/A

Total No. of Questions : 26]

[Total No. of Printed Pages : 11

SS

2038

ANNUAL EXAMINATION SYSTEM

PHYSICS (Theory)

(Common for Science and Agriculture Groups)

(Evening Session)

Time allowed : Three hours

Maximum marks : 70

(English Version)

- Note :**
- (i) You must write the subject-code/paper-code **052/A** 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 serialized 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. For alloys the value of temperature coefficient of resistance is very high. (True / False) 1
2. _____ was the first scientist who produced electromagnetic waves in a laboratory. 1
3. One atomic mass unit is equal to 1.67×10^{-27} g. (Yes / No) 1
4. 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
5. Define resonant frequency of LCR series circuit. 1
6. What is the de-Broglie wavelength of an electron beam accelerated through a potential difference of 25V ? 1
7. Give the basic function of antenna. 1
8. What are diamagnetic substances ? 1
9. How the eye of a person suffering from myopia can be corrected ? Explain with the help of ray diagram. 2
10. A wire with an area of cross-section as 10mm^2 has a resistance of 5Ω , when a potential difference across its ends is 25V. Calculate the drift velocity of electrons. Given the number density of electrons as 5×10^{20} electrons per cubic meter (e/m^3). 2

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11. Explain ground wave propagation. 2
12. Write two uses of infrared rays. 2
13. A capacitor of unknown value and an inductor of 0.1H and a resistor of 10Ω 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
14. Why does the thickness of depletion layer of pn-junction increases in reverse biasing? Draw the circuit diagram of reverse biasing. 2
15. 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
16. What is total internal reflection of light? What are the two essential conditions for total internal reflection to take place? 1, 1/2, 1/2
17. Derive an expression for the energy stored in a capacitor. In what form is the energy stored in a charged capacitor? 3, 1
18. Define e.m.f. of a cell. How can you compare the emf of two cells using potentiometer? 1, 3

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19. (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

20. With the help of labelled diagram, describe the principle, construction and working of a transformer. 1,1,1,1

21. (a) State the laws of photo electric effect.

(b) Name a phenomenon which illustrates the particle nature of light. 3,1

22. What is radioactivity ? State radioactive decay law and show that it is exponential in nature.

1,1,2

23. 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 -5D 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\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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24. (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
- 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
25. (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
26. (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