

CLASS XII

GUESS PAPER-01

PHYSICS

Time allowed: 3hrs

Maximum Marks: 70

1. Arrange the given electromagnetic radiations in descending order of their frequencies :
IR, X – rays, UV and gamma rays
2. The graph shows the variation of voltage V across the plates of two capacitors A and B versus increases of charge stored on them. Which of the two capacitors has higher capacitances
3. A charged particles moving with velocity \vec{v} as shown in fig. experiences on upward force. What is the charge sign on the particle ?
4. In a photoelectric effect experiment the following graph were obtained between photoelectric current and applied voltage. Name the characteristics of the incident radiation that was kept constant.
5. A nucleus makes a transition from one permitted energy levels to another of lower energy. Name the region of the electromagnetic spectrum to which the emitted photon belongs.
6. You are given a low resistance R_1 , a high resistance R_2 and a moving coil galvanometer. Suggest how you would use these to have an instrument than will be able to measure :
(i) Current (ii) Potential difference
7. Name the electrons of earth's magnetic field.
8. The circuit shown in the fig. has identical bulbs P and Q What will happen to the brightness of the bulbs if the resistance R is increased ?
9. Give two applications each of electromagnetic waves of following frequencies :

- (i) 5×10^{19} HZ (ii) 4×10^9 Hz
10. Three wavelength Red, Blue and Green are incident on a right angled prism ABC at the face AB. The refractive indices of the material of the prism for the three wavelengths are 1.39, 1.44 and 1.47 respectively. Out of the three which colour will emerge out of face AC. Give reason for your answer.
11. (a) Name the radiations which :
- (i) have maximum penetrating power (ii) can cause maximum ionisation
- (b) Complete the equation :
- $${}_Z X^A \rightarrow {}_Z Y + {}_{-1} e^0 + \dots\dots\dots + Q$$
12. Derive an expression for capacitance of a parallel plate capacitor.

OR

- An uncharged insulated conductor A is brought near a charged insulated conductor B. What happens to charge and potential of B.
13. Distinguish between point to point and broadcast communication modes. Give one example of each.
14. An electron and a proton have same kinetic energy. Which of the two has greater wavelength ? Justify your answer.
15. The output of two input AND gate is fed to a NOT gate. Draw the symbol of the combination and write down the truth table.
16. Draw graph of show the variation of Binding energy per nucleon while mass number of different nuclei.
17. The I – V graphs of two resistors and their series combination are shown below. Which one of these graphs represents the series combinations of the other two ? Give reason.
18. Write the expression for torque experienced by the dipole placed in a uniform field. Show diagrammatically the orientation of the dipole in a uniform field from which torque is :
- (i) max (ii) zero (iii) Half
19. State Gauss's theorem. Derive the expression for electric field intensity due to an infinite plane sheet of charge.

20. (i) A carbon resistor marked with rings Blue, yellow and Brown respectively is connected in series with a resistance of $20\ \Omega$ and a battery of 10 V. What will be the current through the resistance ?
(ii) A wire is stretched to twice its original length. What will be its new resistivity ?
21. What is Modulation ? Explain the need for modulation in communication. Define the term 'Modulation Index' for AM wave.

OR

- (i) Name an appropriate channel needed to send a signal of Bandwidth 100 KHz over a distance of 8 km.
(ii) Give its range of frequency which can make use of sky wave transmission.
(iii) Name 2 types of orbits used in satellite communication.
22. A coil of inductance 0.16 H is connected to a condenser of capacity $0.81\ \mu\text{F}$. What should be the frequency of ac. That should be applied so that there is resonance in the circuit. Resistance of the circuit. Is negligible.
23. What is meant by linearly polarised light ? Which type of wave can be polarised ? Briefly explain a method for producing polarised light.
24. The graph below shows how the activity of a sample of radon – 220 changes with time. Use the graph to determine its half – life. Calculate the value of decay constant of radon – 220.
25. A child sitting in a class room is not able to read clearly the writing on the blackboard.
(a) Name the type of defect from which his eye is suffering.
(b) With the help of a ray diagram show how this defect can be remedied ?

OR

- Define interference of light, In a Young's double slit experiment the position of the first fringes coincides with S_1 and S_2 respectively. What is the wavelength of light used.
26. Derive the expression for torque on a rectangular coil of area A carrying current I placed in magnetic field B.
27. Establish the relation between drift velocity V_d of an electron in a conductor of cross section A carrying current I and the concentration of free electrons per unit volume 'n' Define conductivity.

28. With a diagram explain principle construction and working of AC generator.

OR

Describe principle, construction and working of transformer. Why is the core of a transformer laminated ?

29. (a) What is a photodiode ? Explain its working with the help of graph ? Why is it operated in reverse bias ?

(b) Pure Si at 300 K has electron (n_e) and hole (n_h) concentration of $1.5 \times 10^{22} \text{ m}^{-3}$. Find n_e in the doped Si. Identity the new type of semiconductor OR

Explain the use of a transistor as a switch with the help of a circuit diagram and graph.

30. Four convex lenses with the following specifications are available :

Lens	Focal Length	Aperture
A	100 cm	10 cm
B	100 cm	5 cm
C	10 cm	2 cm
D	5 cm	2 cm

Which two of the above four lenses should be selected as objective and eye piece of a compound microscope. Draw a labelled ray diagram for the image formed by the microscope. obtain its magnifying power.