XII-PHYSICS (UNIT- 1, 2, 5, 7, 10) – 2022

Marks : 70
Time : 3 Hr.

PART – I

Answer all the questions. **15 x1 = 15**

I) Choose the correct option and write the answer with the option.

1. A parallel plate capacitor stores a charge Q at a voltage V. suppose the area of the parallel plate capacitor and the distance between the plates are each doubled then which is the quantity that will change?

a) Capacitance b) Charge c) Voltage d) Energy density

2. Three capacitors are connected in triangle as shown in the figure. The equivalent capacitance between the points A and C is ?

a) 1μF b) 2μF c) 3μF d) 4μF

3. Two metallic spheres of radii 1 cm and 3cm are given charge of -1 ×10-² C and 5×10-² C respectively. If these are connected by a conducting wire, the final charge on the bigger sphere is

a) 3×10-²C b)) 4×10-²C c) 1×10-²C d) 2×10-²C

4. The internal resistance of a 2.1 V cell which gives a current of 0.2 A through a resistance of 10 Ω is ?

a) 0.2 Ω b) 0.5 Ω c) 0.8 Ω d) 1.0 Ω

5. A toaster operating at 240 V has a resistance of 120 Ω. Its power is

a) 400W b) 2W c) 480W d) 240W

6. The temperature coefficient of resistance of a wire is 0.00125 per °C. at 20°C , Its resistance is 1Ω. The resistance of the wire will be 2Ω at?

a) 800°C b) 700°C c) 850°C d) 820°C

7. Which of the following electromagnetic radiations is used for viewing objects through fog ?

a) Microwave b) Gamma rays c) X-rays d) Infrared

8. Fraunhofer lines are an example of …….. spectrum.

a) Line Emission b) Line Absorption c) Band Emission d) Band Absorption

9. Which of the following is an electromagnetic wave?

a) α - rays b) ß – rays c) ɣ - rays d) all of them

10. The transverse nature of light is shown in ?

a) interference b) diffraction c) scattering d) polarisation

11. Light transmitted by Nicol prism is, ?

a) partially polarised b) unpolarised c) plane polarised d) elliptically polarised

12. A plane glass is placed over a various coloured letters (violet, green, yellow, red) the letter which appears to be raised more is ?

a) red b) yellow c) green d) violet

13. The barrier potential of a silicon diode is approximately,

a) 0.7 V b) 0.3 V c) 2.0 V d) 2.2 V

14. The zener diode is primarily used as.

a) Rectifier b) Amplifier c) Oscillator d) Voltage regulator

15. If the input to the NOT gate is A = 1011, Its output is ?

a) 0100 b) 1000 c) 1100 d) 0011

PART - II

II) Answer any 6 questions. Question NO. 24 is compulsory. **6 x 2 = 12**

16. Define capacitance. Give its unit?
17. What is meant by Quantisation of charges?
18. Define current density.
19. What is Seebeck effect?
20. What is displacement current?
21. What is meant by Fraunhofer lines?
22. Define work function of a metal. Give its unit?
23. What are X rays?
24. Prove the Boolean identity AC + ABC = AC and give its circuit description?

PART - III

III) Answer any 6 questions. Question NO. 33 is compulsory. **6 x 3 = 18**

25. State and prove De Morgan's first and second theorems.
26. List out the laws photoelectric effect.
27. Derive an expression for De Broglie wavelength of electrons.
28. Write down the properties of electromagnetic wave?
29. Write a note on UV- rays.
30. Explain Thomson effect.
31. Distinguish between drift velocity and mobility.
32. What is corona discharge?
33. Calculate the number of electrons in one coulomb of negative charge.

PART – IV

Answer all the questions. **5 x5 = 25**

34. a) Derive an expression for electrostatic potential due to an Electric dipole . (OR)

b) Derive an expression for electric field due to a dipole on its Equatorial plane

35. a) Describe the Microscopic model of current and obtain general form of Ohm's law (OR)

b) Obtain the condition for bridge balance in Whetstone's bridge?

36. a) Explain in detail the emission spectra and absorption spectra ? (OR)

b) Write down Maxwell equations in integral form.

37. a) Obtain Einstein 's photoelectric equation with necessary explanation (OR)

b) Describe briefly Davisson – Germen Experiment which demonstrated the wave electrons.

38. a) Explain the constructional and working of a Full wave rectifier (OR)

b) Explain the constructional and working of a Half wave rectifier

..... ALL THE BEST....

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