M M A HIGHER SECONDARY SCHOOL-PAPPANADU

STD:XII | FULL PORTION MODEL QUESTION PAPER-II | TIME:3.00 HOURS

SUB: PHYSICS | MARKS:70

I) CHOOSE THE CORRECT ANSWER: 15×1=15

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

a) microwave b) infrared c) X- rays d) gamma rays

2. For light incident from air on a slab of refractive index 2, the maximum possible angle of refraction is,

a) 30^o b) 45^o c) 60^o d) 90^o

3. The current amplifier of common base N-P-N transistor is 0.96. What will be the current hain if it is used as common writter amplifier?

a) 16 b) 20 c) 24 d) 32

4. Which charge configuration produces a uniform electric field?

a) point charge b) uniformly charged infinite line

c) uniformly charged infinite plane d) uniformly charged spherical shell

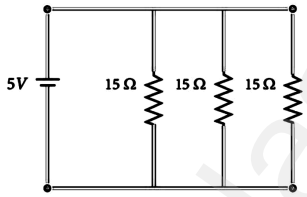
5. The gravitational waves were theoretically proposed by

a) Conrad Rontgen b) Marie Curie c) Edward Purcell d) Albert Einstein

6. Phosphor-Bronze wire is used for suspension in a moving coil galvanometer because it has

a) High conductivity b) High resistivity c) Large couple per unit twist d) Small couple per unit twist

7. What is the current drawn out from the battery?



a) 1A b) 2A c) 3A d) 4A

8. In an electron microscope, the electrons are accelerated by a voltage of 14 kV. If the voltage is changed to 224 kV, then the de Broglie wavelength associated with the electrons would

a) increase by 2 times b) decrease by 2 times c) increase by 4 times d) decrease by 4 times

9. In the Bohr model of hydrogen atom, the ratio of the kinetic energy and total energy if electron in the n^{th} quantum state will be

a) 1/2 b) -1 c) +1 d) +2

10. Mirage is formed due to

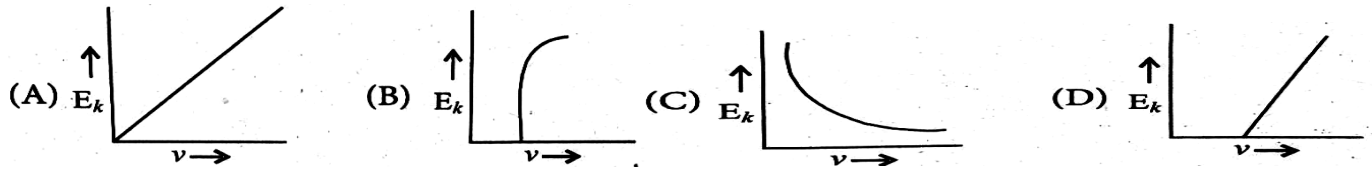
a) reflection b) refraction

c) total internal reflection d) change in the refractive index of air with change in temperature

11. Two coherent monochromatic light beams of intensities I and 4I are superposed. The maximum and minimum possible intensities in the resulting beam are

a) 5I and I b) 5I and 3I c) 9I and I d) 9I and 3I

12. The kinetic energy E_k of a photoelectron varies with the frequency v of the incident radiation as which of the following?



13. A step-down transformer reduces the supply voltage from 220 V to 11 V and increase the current from 6 A to 100 A. Then its efficiency is

a) 1.2 b) 0.83 c) 0.12 d) 0.9

14. The SI unit of activity of radioactive source is

a) Kelvin b) Gauss c) Becquerel d) Newton

15. The barrier potential of a p-n junction depends on i) type of semiconductor material ii) amount of doping iii) temperature. Which one of the following is correct?

a) (i) and (ii) only b) (ii) only c) (ii) and (iii) only d) (i) (ii) and (iii)

II) ANSWER ANY SIX QUESTIONS: Q.NO:24 IS COMPULSORY: 6×2=12

16. Define impact parameter.
17. Write the limitations of cyclotron.
18. What is an equipotential surface?
19. What do you mean by skip area?
20. A monochromatic light of wavelength of 500 nm strikes a grating and produces fourth order maximum at an angle of 30^{o}. Find the number of slits per centimeter.
21. Distinguish between drift velocity and mobility.
22. Mention the ways of producing induced emf.
23. Why does sky appear blue?
24. Compute the speed of the electromagnetic wave in a medium if the amplitude of electric and magnetic fields are 3×10^{4} N $C^{-1}$and 2×10^{-4} T, respectively.

III) ANSWER ANY SIX QUESTIONS: Q.NO:33 IS COMPULSORY: 6×3=18

25. Write the properties of cathode rays.
26. State and obtain Malus' law.
27. Obtain the expression for energy stored in the parallel plate capacitor.
28. Give the applications of photo cell.
29. Discuss the conversion of galvanometer into a voltmeter.
30. What is the radius of the illumination when seen above from inside a swimming pool from a depth of 10 m on a sunny day? What is the total angle of view? [Given, refractive index of water is 4/3]
31. Explain the equivalent resistance of a series resistor network.
32. Write the advantages and disadvantages of AC over DC.
33. Calculate the range of the variable capacitor that is to be used in a tuned-collector oscillator which has a fixed inductance of 150 μH. The frequency band is from 500 kHz to 1500 kHz.

IV) ANSWER ALL THE QUESTIONS: 5×5=25

34. (a) Obtain a relation for the magnetic field at a point along the axis of a circular coil carrying current using Biot-Savart law.

[OR]

(b) Describe the Fizeau's method to determine the speed of light.

35. (a) Discuss the spectral series of hydrogen atom.

[OR]

(b) Obtain the expression for electric field due to an infinitely long charged wire.

36. (a) Explain the determination of the internal resistance of a cell using potentiometer.

[OR]

(b) (i) State de Broglie hypothesis.

(ii) Derive an expression for de Broglie wavelength of electrons.

37. (a) Explain the basic elements of communication system with the necessary block diagram.

[OR]

(b) Derive an expression for phase angle between the applied voltage and current in a series RLC circuit.

38. (a) Write down Maxwell equations in integral form.

[OR]

(b) Obtain the equation for bandwidth in Young's double slit experiment.

****

PREPARED BY: M.TAMIZHARASAN.M.Sc.,B.Ed.,

PG ASSISTANT IN PHYSICS,

M M A HR.SEC SCHOOL- PAPPANADU , THANJAVUR DISTRICT.