**Pratice Paper 2**

**Class – XII**

**Subject – Physics**

**Time: 3 Hrs MM: 70**

**General Instructions:**

All questions are compulsory.

There are 26 questions in total. Questions 1 to 5 carry 1 mark each, questions 6 to 10 carry 2 marks each, question11to 22 carry 3 marks each and question 23 carry 4 marks, questions 24 to 26 carry 5 marks each.

There is no overall choice.

Use of calculators is not permitted.

You may use the following physical constants wherever

necessary.

c = 3 x 108 ms–1

h = 6.626 x 10–34 Js

e = 1.602 x 10–19 C

μ0 = 4 π x 10–7 T m A–1

Mass of neutron mn ≅ 1.675 x 10–27 kg

Boltzmann’s constant k = 1.381 x 10–23 J K–1

Avogadro’s number NA = 6.022 x 1023 / mol –1

Q.1 Which types of waves can be polarised?

Q.2 Find the resistance of a colour coded carbon resistor with first , second and third rings of yellow,

green and orange colours.

Q.3 A wire of resistance 40 Ohm is bent in the form of a circle. What is the effective resistance between the ends of a diameter AB?

Q.4 The stopping potential in a experiment of photoelectric effect is 2.5V. What is the maximum

kinetic energy of photoelectrons emitted?

Q.5 Calculate refractive index of a medium whose critical angle is 30°.

Q.6 What the de-broglie hypothesis.Find out de broglie wavelength of a ball of mass 6 kg and moving with a velocity of 2 m/sec.

Q.7 What is the work done by the magnetic field and electric field on a moving charged particle?

Q.8 What are eddy currents .How these can be minimised?

Q.9 How does Zener diode acts as voltage stabiliser?

Q.10. Define electric flux. Write its S.I. units. A change q is enclosed by a spherical surface of radius R. If the radius is reduced to half how would the electric flux through the surface change ?

Q.11 An electric dipole of length 2cm is placed with its axis making an angle 600 to a uniform electric field of 105 N/C. If it experiences a torque of 8√3 Nm. Calculate the (i) magnitude of

the charge on the dipole (ii) potential energy of the dipole.

Q.12 A sinusoidal voltage V=200 sin 314t is applied to a resistor of 10 ohms resistance. Calculate (i)

rms value of the voltage, (ii) rms value of the current and (iii) power dissipated as heat in watts.

Q.13 A Double convex lens is to be manufactured from a glass of refractive index 1.55, with both the

faces of the same radius of curvature. What is the radius of curvature if the focal length is 20cm?

Q.14 Identify the part of the electromagnetic spectrum which is

(i) suitable for radar systems used in aircraft navigation.

(ii) used for studying crystal structure.

(iii) produces intense heating.

(iv) has its wavelength range between 390nm and 700nm.

(v) has largest penetrating power.

(vi) used in microwave ovens.

Q.15 Define angle of dip. If the ratio of the horizontal component of earth’s magnetic field

to the resultant magnetic field at a place is 1/2, what is the angle of dip at that place?.

Q.16 Define capacitance of a capacitor.How does capacitances of parallel plate capacitor changes with dielectric.

Q.17 (i) What is a metre bridge?

(ii) In a meter bridge balance point is found at a distance l1= 40cm with resistances R and S as shown in the figure. When a resistance X = 12 Ohm is connected in parallel with the resistance S, the balance point shifts to a distance l2 =50cm from A. Determine the values of R and S.

Q.18 What is the ionisation energy of hydrogen atom. Find the shortest wavelength present in the

paschen series of spectral lines?

Q.19 Draw a graph to show the variation of the angle deviation ‘D’ with that of theangle of

incidence ‘I’. For a monochromatic ray of light passing through a glass of prism of

refracting angle ‘A” deduce the refractive index n of the prism.

Q.20 Find the ratio of the intensities at two points on a screen in young’s double slit experiment when the waves from two slits have a path difference of (i) 0 (ii) λ/4.

Q.21 (a) A radioactive isotope has a half life of 5 years. After how much time is its activity reduces to 3.125 % of its original activity?

(b) Write the nuclear equations for α decay of

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Q.22What is modulation? Why modulation is necessary in communication system?

Q.23 Suhasini’s uncle is advised by his doctor to have an MRI scan on his chest. Her uncle did not

know much about the details and the significance of this test. He also felt that it was too expensive and thought of postponing it. When suhasini learnt about her uncle’s problems, she immediately decided to do something about it. She took the help of her family, friends and neighbours and arranged for the cost of the test. She also told her uncle that an MRI (Magnetic Reasonance Imaging) scan of his chest would enables the doctors to know the condition of his hearts lungs without causing any( test related) harm to him. This test was expensive because of its set up that needs strong magnetic field ( 0.5T to 3 T) and pulses of radio wave energy. Her uncle was convinced and had the required MRI scan of his chest done. The resulting information greatly helped his doctors to treat him well.

(a) What according to you are the values displayed by suhasini and her family, friends and

neighbours to help her uncle ?

(b) Assuming the MRI scan of his uncle’s chest was done by using a magnetic field of 1T . Find

the maximum and minimum value of the force exerted by the magnetic field on a proton that

was moving at a speed of 104 m/sec. State the condition under which this force has minimum

value.

Q.24 State Huygen’s principle. Derive the law of refraction and reflection on the basis of Huygen’s wave theory of light.

OR

(i) Explain the phenomenon of diffraction of light at a single slit to show the formation of

diffraction fringes.

(ii) Calculate the distance that a beam of light of wavelength 500nm can travel without

significant broadening, if the diffracting aperature is 3mm wide.

Q.25 (a) With the help of a circuit diagram explain the working of a transistor as amplifier.

(b) If a change of 100μA in the base current of an n-p-n transistor causes a change of 10mA

in its collector current. What is it’s a.c. current gain.

OR

With the help of circuit diagram, explain the working of a p-n junction diode as full wave

rectifier. Show the input and output wave forms.

Q26. State the principle and working of an alternating current generator.

OR

(a) Derive the expression for the impedance of an ac circuit with a inductor, a capacitor and

a resistance in series.

(b) Discuss LC oscillations.