NEB Grade 12 Physics Model Question

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Here you will find model question of Physics issued by NEB, Nepal.

Sub.Code : 210

NEB – GRADE XII

subject:Physics

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Time: 3 hrs. Full Marks: 75
Pass Marks: 27(For partial students only)
Group 'A'

1. Answer, in brief, any four questions. 4×2=8

a) Two wires, one of copper and other of iron, have the same diameter and carry the same current. In which wire the drift velocityof the free electrons will be more ?
b) Draw a circuit diagram of meter bridge to determine the resistance of a wire. Give the formula used.
c) Mention any two factors on which thermos electric emf produced in thermocoupledepends.
d) How does the conduction of electricity in a metallic conductor differ from that in electrolyte ?
e) When a charged particle moves in a magnetic field, does its kinetic energy always remain constant ? Explain.
f) Ifthenumberofturnsofasolenoidisdoubled,keepingtheotherfactors constant, how does the self inductance of the solenoid change ?

2. Answer, in brief, any four questions. 4×2=8

a) A discharge tube is filled with different gases turn by turn under the same pressure. Will the discharge occur for the same voltage across the electrodes ?
b) Draw a logic symbol and write a truth table for a two input NAND gate.

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c) An electron and proton travel at the same speed.Which has the shorter wavelength ?

d) What are the units of activity of radioactive elements ?

e) Distinguish between leptons and quarks.

f) Explain the significance of Hubble’s constant.

3. Answer, in brief, any one question.

a) Distinguish between light waves and sound waves.

b) Whistle of an approaching train is shriller.Why?

4. Answer, in brief, any one question.

a) State and explain Huygen’s construction.

b) Diffraction of audible sound is easily observable, why?

Group ‘B’

5. Answer any three questions. 3×4=12

a) State and explain principleof potentiometer. Describe with the help of circuit diagram, the use of potentiometer to compare the emf of two primary cells.

b) Derive an expression for the force acting between two parallel current carrying conductors and hence explain why two straight conductors carrying current in the same direction attract each other.

c) Define relative permeability and susceptibility o fasubstance.Compare Para and ferro-magnetic materials on the basis of these quantities.

d) Derive an expression for the impedance of an ac circuit containing a resistor, ann inductor and a capacitor in series.Also,obtain an expression for the resonant frequency of the circuit.

6. Answer any three questions. 3×4=12

a) What is a zener diode ? With the help of circuit diagram, explain the use of zener diode as a voltage regulator.

b) Describe the construction and working principle of He-Ne laser.Also Obtaintherelation betweend is integration constant and half life.

c) .Obtaintherelation betweendisintegrationconstant andhalf life.

d) What do you mean by energy crisis ? Discuss energy consumption scenario of Nepal.

7. Answer any one question.

4 a) Explain why and how Laplace corrected the Newton’s formula for the velocity of sound in air.Also, discuss the effect of temperature on the

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velocityof sound in a gas medium.

b) Whatisintensityofsound?Provethatintensityofsoundisproportional to the square of amplitude of vibration for the given source of sound.

8. Answer any one question.

a) Describe Michelson’s experimental method for the measurement of velocityof lightwithnecessarytheory.

b) What is polarization of light ? Discuss polarization by reflection and prove Brewster’s law.

Group ‘C’

9. Answer any two numerical questions. 2×4=8

a) Aheatingcoilistobemadefromnichromewirewhichwilloperateon 12Vsupplyandwillhavepower25W.Calculatethelengthofnichrome wire needed if the cross sectional area of the wire is 10 mm2 and the resistivityof thenichrome is10-6Ωm.

b) A solenoid is to be designed to produce a magnetic field of 0.027 T at its centre. It has radius 1.4 cm, length 40 cm and carries a maximum current of 12A. Find the minimum number of turns the solenoid must have and total length of the wire required.

c) A conductor of length 2m moves making an angle of 450 with the direction of uniform magnetic field 0.2 T with a velocity of 5m/s. Calculate the induced emf in it.

10. Answer any two numerical questions. 2×4=8

a) Anelectronisacceleratedthrougha potentialdifferenceof20 KVand isthenallowedtocirculateatright anglestouniformmagnetic fieldof 0.1 T. What is the radius of the path ? (e/m = 1.8×1011 c/kg)

b) Light of wavelength 600 nm falls on a photosensitive plate of work function1.9eV. Findthe kinetic energyof photoelectronsemitted and stopping potential. (h = 6.62×10-34 Js, c= 3×108 m/s, e= 1.6×10-19 C)

c) The energy liberated in the fission of a single atom of uranium-235 is 3.2×10-11 J.Calculatethepowerproductioncorrespondingtothefission of 2 gm of uranium per day. (Avogadro constant = 6.023×1023 /mol)

11. A steel wire of length 40 cm and diameter 0.025 cm vibrates transversely in resonance with a tube, open at both ends and of effective length 60 cm, wheneachis soundingitsfundamentalnote.Findthetensionin thewireif velocityof sound in air is 340 m/s and density of steel is 7800 kg/m3. 4

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12. In double slit experiment, the slits are 0.3 mm apart and interference is observed on a screen placed at a distance of 90 cm from the slits. The second dark band is 0.3 cm from the central bright fringe. Calculate the wavelengthof lightused. 3

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