Council for Technical Education and Vocational Training
Office of the Controller of Examinations
Sanothimi, Bhaktapur
Regular/Back Exam-2077, Chaitra

Program: Diploma in Engineering All
Year/Part: I/II (New+Old Course)
Subject: Engineering Physics II

Full Marks: 60
Pass Marks: 24
Time: 3 hrs

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

Group "A"

Attempt Any Four questions. [4x6=24]

1. Define electric potential at a point. Derived an expression for potential at a point due to a point charge.
2. What is Wheatstone bridge? Describe its balanced condition using Kirchhoff's low.
3. Write Newton's formula for velocity of sound in air and explain how Laplace corrected it?
4. State Bohr's postulates of hydrogen atom. Derive an expression for the energy of an electron in the n^{th} orbit of hydrogen atom.
5. Define stress and strain. Derived an expression for energy stored in stretched wire. Also find the energy density.
6. What is photoelectric effect? Discuss Einstein's photoelectric equation.

Group "B"

Attempt Any Four questions. [4x3=12]

7. How will you convert a galvanometer into an ammeter?
8. State and explain Faradays laws of electrolysis.
9. Discuss the various modes of vibration in closed organ pipe.
10. What is X-ray? What are the importance properties of X-rays?
11. Define semiconductor. Differentiate between intrinsic and extrinsic semiconductors.

Cont.....

12. Differentiate between interference and polarization of light.

Group "B"

Attempt Any Six questions. [6x4=24]

13. A constant voltage a.c. generator of 20V, 50Hz is connected with a resistor of resistance 2.0Ω, a coil of inductance 5.0H and a capacitor of capacitance 2.0μF. Calculate the current flowing through on circuit.
14. A battery of Emf 24V and internal resistance 'r' is connected to a circuit having two parallel resistance of '3Ω and 6Ω are series with 8Ω resistance. Current flowing in 3Ω resistor is 0.8A. Calculate the current in 6Ω resistance, internal resistance and p.d. of battery.
15. The critical angle of glass is 42°. What's the polarizing angle?
16. Find the half-life period of radioactive material if its activity has decayed to 1/128th of its initial activity after 50 days.

17. An electron is revolving in a uniform magnetic field of strength 1.5×10^{-2}T. The radius of circular path is 1.2×10^{-2}m. Through what potential difference was the electron initially accelerated from rest? [$^{e}/_{m}$ for electron $= 1.76 \times 10^{11}$c/kg].

18. Find the height to which water will rise in capillary tube of 1.4mm diameter, surface tension of water is7.2×10^{-2}N/m and angle of contact is 10°.
19. Two capacitors of capacitance 4μF and 12μF respectively are connected in series and the combination connected momentarily across a 200V battery. The charged capacitors are now isolated and connected in parallel, similar charged plates connected together. What would be the common potential difference on the capacitor.
20. Velocity of sound in air at 0^{-c} is 332m/s. Find the change in velocity per degree raise in temp.

Good Luck !