NEB - GRADE XII

Physics
Model Question [2077(2020)]

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

Full Marks: -30

Time -1.30 hrs.

Group 'A'

1. Answer any **three** questions: 3×2=6
   a. Why is the conductivity of an electrolyte very low as compared to a metal at room temperature ?
   b. What are the advantages of A.C. over D.C. ?
   c. Production of X-ray is the inverse phenomenon of photoelectric effect. Justify it.
   d. What is the threshold of hearing. Define one bel.
   e. Is polarization possible for longitudinal waves ? Justify.

Group 'B'

2. Answer any **three** questions: 3×4=12
   a. Why has an ammeter a very low resistance ? How can you convert a galvanometer into an ammeter ?
   b. Explain the working of He-Ne laser.
   c. What is Doppler effect ? Find the change in frequency when on observer moves towards a stationary source and then moves away from the source.
   d. Describe Michelson's method to measure the velocity of light.

Group 'C'

3. Solve any **three** numerical questions: 3×4=12
   a. The total length of the wire of a potentiometer is 10m. A potential gradient of 0.0015v/cm is obtained when a steady current is passed through

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this wire. Calculate,

i) the distance of null point on connecting standard cell of 1.018V.

ii) the unknown p.d. if the null point is obtained at a distance of 940 cm,

and

iii) the maximum p.d. which can be measured by this instrument.

b. $_{28}Ni^{62}$ may be described as the most strongly bound nucleus because it has the highest B.E. per nucleon. Its neutral atomic mass is 61.928349 a.m.u.. Find its mass defect, its total binding energy and binding energy per nucleon.

Given, mass of neutron=1.008665amu

mass of proton=1.007825amu

1amu=931.5MeV.

c. A source of sound produces a note of 512 Hz in air at 17^0c with wavelength 66.5cm. Find the ratio of molar heat capacities at constant pressure to constant volume at NTP. Densities of air and mercury at NTP are 1.293kg/m^3 and 13600kg/m^3 respectively.

d. Two coherent sources A and B of radio waves are 5m apart. Each source emits waves with wavelength 6m. Consider points along the line between two sources, at what distances, if any, from A is the interference constructive.

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