U.G. 4th Semester Examination - 2021

PHYSICS

[HONOURS]

Course Code : PHY-H-CC-P-09

[PRACTICAL]

Full Marks : 20 Time : 2 Hours

Answer any **ten** questions : 2×10=20

a) In a single slit experiment, which phenomena of light is observed? If the width of the silt is doubled, how the size of the central diffraction band are affected?

b) Draw a schematic experimental setup of the Millikan oil-drop experiment.

c) What is the wavelength of H-alpha lines of H-atoms? Show the spectral lines of this series in H-atom.

d) Draw a suitable circuit diagram to measure the Plack's constant using Light Emitting Diode(LED). What is the reason for using a load resistor in series with LED in this circuit?

e) Plot plate current (I_p)vs plate voltage (V_p) graph for a vacuum diode and verify the laws of thermionic emission. Is Ohm's law obeyed in vacuum diodes?

f) What is the photodetector and photomultiplier tube?

g) What is the photoelectric effect? Why it is necessary to keep the photoelectric cell in a vacuum?

h) Mention the names of the apparatuses you are going to use to measure Planck constant by using black body radiation and photo-detector.

i) Write down the formula for intensity distribution for double-slit Fraunhofer diffraction.

j) What is the difference between a Tunnel diode and a normal semiconductor diode? Draw the I-V characteristics of a Tunnel diode and specify the negative resistance region.

k) What do you mean by ionization potential? What is the value of ionization potential for the 1^{st} and ∞-th orbits of H-atom?

l) What is LED and how it is made? Draw the intensity vs forward voltage graph of a LED.

m) Explain how you can measure the work function of the material of the filament of a directly heated vacuum diode.

n) Write the Richardson-Dushman equation and Child Langmuir's law explain the terms associated with these equations.

o) How do you calculate workfunction using a photoelectric cell?

p) Write the Planck radiation law, plot it with wavelength for various temperatures.

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