28/9/15 ATKT

VCD FYBSC PHYSICSII SEM-II 2015-2016 MARKS-75 TIME-2: 30 HRS

NOTE: Figures to the right indicate full marks.
Non programmable calculators are allowed.
All questions are compulsory.

Q1) Answer the following. (20M)

A) State the main feature of moving coil galvanometer and explain its working. (8M)

OR

A) State Thevenin's theorem. Illustrate it with suitable example. (8M)

B) Find the condition of balance for Wein bridge. How would you determine the frequency of the ac supply? (7M)

OR

B) What is ballistic galvanometer? Explain the difference between the ballistic and dead beat galvanometer. (7M)

C) A B.G. has a steady deflection of150 mm for a current of 0.3 μA at a distance of 1 meter. It completes 10 oscillations in 62.8s. Find its current and charge sensitivities. What should be the undamped throw? When a charge of 0.15m circulates through the B.G.? (5M)

OR

C) Explain De Sauty's capacitance bridge. find the condition for its balance. (5M)

Q2) Answer the following. (20M)

A) What do you understand by nuclear magnetic resonance? Mention its applications. (8M)

OR

A) What is radioactivity? Explain the five kinds of radioactivity with suitable examples. (8M)

B) Define half-life time of radioactive element. Show that it is inversely proportional to the decay constant. (7M)

OR

B) Explain why an electron can not exist in the nucleus. (7M)

C) Write a note on radiation hazards. (5M)

OR

C) Calculate the mass of deuterium nucleus: if 1 MeV is the B.E./nucleon. (5M)

Q3) Answer the following. (20M)

A) Explain Compton Effect. Find the expression for Compton shift. (8M)

OR

A) With neat and labeled diagram. explain the set up of Davisson-Germen experiment on electron diffraction. (8M)

A) Write a note on pair production. (7M)

OR

B) Explain how the de Broglie waves support the Bohr's quantization rule. (7M)

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C) Find the de Broglie wavelength of baseball of mass 2.5 kg. having velocity of 10m/sec. (5M)

OR

C) What is the threshold wavelength for pair production? (5M)

Q4) Answer the following. (15M)

A) What is the acceleration potential to be provided to an electron of a de Broglie wavelength of 1 A^0.
B) Explain the phenomenon of gravitational red shift.
C) State and explain maximum power transfer theorem.
D) Obtain the condition of balance for Maxwell's L/C bridges.
E) Explain meson theory of nuclear forces..
F) If a sample of radium has half-life time of the order 22 years. Find the time taken by sample to decrease to 10%.

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