



AC-2946

B. Sc. (Sem. II) Examination

March/April – 2015

Applied Physics : Paper - I

(For Electronics Special Course)

Time : 2 Hours]

[Total Marks : 50

Instructions : (1)

नीचे दशांशवैल निशानीवाणी विगतो उतरवडी पर अवश्य लपवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="B. SC. (SEM. II)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="APPLIED PHYSICS : PAPER - I"/>	<input type="text"/>
Subject Code No. : <input type="text" value="2"/> <input type="text" value="9"/> <input type="text" value="4"/> <input type="text" value="6"/>	<input type="text"/>
Section No. (1, 2,.....): <input type="text" value="Nil"/>	<input type="text"/>
	Student's Signature

- (2) Draw neat and clean diagram wherever necessary.
- (3) Symbols used in the paper have their usual meaning.
- (4) Numbers to right indicate full marks of the question.

Constants :

- (1) Speed of light (in vacuum) $C = 3 \times 10^8$ m/s
- (2) Planck's constant $h = 6.62 \times 10^{-34}$ js
- (3) Mass of electron $M_e = 9.1 \times 10^{-31}$ kg
- (4) Charge of electron $e = 1.6 \times 10^{-19}$ c
- (5) Avogadro number $N_A = 6.02 \times 10^{23}$

1 Answer the following questions in short, each carries two marks : 14

- (a) Write uses of study of physics of fluids
- (b) Define Gauge pressure
- (c) What is an apparent weight ?
- (d) What is irrotational flow ?
- (e) Write characteristics of Laser light.
- (f) State Archimedes principle.
- (g) What do you mean by soft and hard x-rays ?

2 (a) Derive the necessary equation for a Venturimeter used to measure the flow speed of a liquid in a pipe. 8

OR

- (a) State Pascal's principle and how it can be applied to a hydraulic lever ? 8
- (b) Ethanol of density $\rho = 791 \text{ kg/m}^3$ flows smoothly through a horizontal pipe that tapers in the cross section area from $A_1 = 1.2 \times 10^{-3} \text{ m}^2$ to $A_2 = A_1/2$. The pressure difference between the wide and narrow sections of pipe is 4120 Pa. What is the volume flow rate R_v of the ethanol ? 4

OR

- (b) The diameter of two cylindrical arms of a hydraulic press are 10 cm and 1 m. Oil is filled them. Air tight pistons are so arranged that they touch the free surface of oil in both the arms. What will be the force applied on the piston in a smaller cylinder to balance the load of 5000 kg on the piston in the larger cylinder ? What will be the pressure exerted on the oil filled in the press ? 4

- 3 (a) Give the mechanism of production of x-rays and explain the distinction between the characteristic and continuous x-radiation. 8

OR

- (a) Discuss the diffraction of x-rays by a three-dimensional lattice with special reference to Laue photographs and their interpretation. 8
- (b) Find the critical voltage that must be applied to an x-ray tube to excite the K-series of Copper. Given that the K-absorption limit is 1.380 Å. 4

OR

- (b) An x-ray tube operates at 30 KV. Calculate the shortest wavelength of the emitted x-rays and corresponding frequency. 4

- 4 Write short note on any two : 12
- (i) Intensity measurement of x-rays
- (ii) Venturie meter
- (iii) Characteristic x-ray lines.
- (iv) Modern x-ray tube.