



A-2985

B. Sc. (Sem. III) Examination

March / April - 2015

Physics : Paper - V

(Physics for Electronics Special)

(Modern Physics)

Time : Hours]

[Total Marks : 50

Instructions :

(1)

नीचे दशांशों में निशानीवाणी विगतो उत्तरवही पर अवश्य लिखनी. Fillup strictly the details of signs on your answer book.	Seat No. : □ □ □ □ □ □
Name of the Examination : B. SC. (SEM. 3)	Student's Signature
Name of the Subject : PHYSICS : PAPER - V	
Subject Code No. : 2 9 8 5 Section No. (1, 2,.....) : NIL	

- (2) Draw neat and clean diagram wherever necessary.
(3) Symbols used in the paper have their usual meaning.
(4) Figures to right indicate full mark.
(5) Constants:
Rest mass of electron $m_e = 9.1 \times 10^{-31}$ kg
Charge of electron $e = 1.6 \times 10^{-19}$ C
Speed of light $C = 3 \times 10^8$ m/s
Planck's constant $h = 6.3 \times 10^{-34}$ J.s.

1 Answer the following questions in short. Each question carries one marks. 8

- (1) Define frames of reference.
- (2) What do you mean by complementary principle ?
- (3) State The fundamental laws of photoelectric emission.
- (4) State Wein's displacement law.
- (5) What do you mean by Galilean invariance ?
- (6) Sketch the black body radiation curve.
- (7) What is photoelectric cell ?
- (8) Calculate the de Broglie wavelength of a 1g ball with a velocity of 1 m/s.

2 (a) Derive the Einstein mass energy equivalence relation. Prove that particle has definite energy corresponding to a specific value of its momentum. 10

- (a) Derive Lorentz transformation and discuss its importance.
- (b) An electron ($m=0.511 \text{ MeV}/c^2$) having momentum of $2.00 \text{ MeV}/c$, find its total energy according to momentum and energy relation. **4**
- OR**
- (b) An electron moving with a velocity of $0.98c$, calculate its kinetic energy.
- 3** (a) Explain Planck's hypothesis for blackbody radiation and derive radiation law. **10**
- OR**
- (a) What is Compton effect ? Prove that Compton effect is depend on scattering angle.
- (b) X-rays of wave length 10.0 pm are scattered from a target, **4**
- (i) Find the wavelength of X-rays scattered through 45° ,
- (ii) Find the maximum wavelength present in the scattered X-rays.
- OR**
- (b) Sketch the characteristics of photoelectrons.
- 4** Write short notes : (Any two) **14**
- (1) De-Broglie's concept of matter.
- (2) Michelson – Morley's experiment.
- (3) Davisson and Germer's experiment
- (4) Experimental illustration of uncertainty principle.
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