AAFAQ ACADEMY – KASUR

Physics Book II **Chapter (19) NEW** **Objective + Subjective**

DAWN OF MODERN PHYSICS

Test Session 2014 – Name : _____ Roll No: (in words) _____

OBJECTIVE

Time: 10 Minutes **Marks: 10**

Note: Write your roll No. in space provided. Over-writing, cutting, erasing, using of lead pencils will result into loss of marks.

Q.1: Encircle the correct answers.

i. Which one of the following physical quantities change with relativistic speed?
a) Length
b) Time
c) Mass
d) All of above

ii. For a black body, the product if λ_m and T known as:
a) Wien's constant
b) Planck's constant
c) Davison constant
d) Lumber's constant

iii. The photoelectric effect predicts that light is made of:
a) Photons
b) Neutrons
c) Protons
d) None of these

iv. The unit of work function is:
a) Electron
b) Ampere
c) Volt cell
d) Hz

v. If the energy of photon is 10 eV and work function is 5 eV. Then the a value of stopping potential will be:
a) 50 V
b) 2 V
c) 5 V
d) 15 V

vi. Einstein photoelectric equation is:
a) $\text{hf} = \phi + \frac{1}{2}mV^2_{\max}$
b) $\phi = h\text{f} + \frac{1}{2}mV^2_{\max}$
c) $\text{hf} + \phi = \frac{1}{2}mV^2_{\max}$
d) None of these

vii. The Compton effect is associated with:
a) X-rays
b) γ-rays
c) Positive rays
d) β-rays

viii. The numerical value of Compton wavelength is equal to:
a) $3.43\times10^{-12}m$
b) $1.43\times10^{-12}m$
c) $2.43\times10^{-12}m$
d) $0.43\times10^{-12}m$

ix. Unit of Stephen's constant is:
a) W m K^{-2}
b) W m^{-2} K^{-4}
c) W m K^{-4}
d) None

x. Compton shift is maximum for scattering angle of photon:
a) 0^0
b) 90^0
c) 180^0
d) 45^0

SUBJECTIVE

Time: 30 min. **Marks: 20**

Q.2: Write the short answers. **(2×6)**

i. As a solid is heated and begins to glow, why does it first appear red?

ii. What happens to total radiation from a blackbody if its absolute temperature is doubled?

iii. Which photon, red, green, or blue carries the most (a) energy and (b) momentum?

iv. Which has the lower energy quanta? Radio waves or X-rays?

v. Will bright light eject more electrons from a metal surface than dimmer light of the same colour?

vi. Will higher frequency light eject greater number of electrons than low frequency light?

vii. When light shines on a surface, is momentum transferred to the metal surface?

viii. Can pair production take place in vacuum? Explain?

Note: Long questions:

Q.3 (a) State and prove the Heisenberg uncertainty principle. (5)

(b) What is the mass of a 70 kg man in a space rocket traveling at 0.8 c from us as measured from Earth? (3)