UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Fourth Semester – Spring 2022

Roll No. .....

Paper: Physics-IV (Concepts of Modern Physics) **Course Code: PHY-213** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Briefly describe the following. (15x2=30)

i. Briefly describe the Rayleigh's Jeans Law.
ii. Briefly mention four characteristics of laser light.
iii. Explain the concept of wave particle duality by giving at least one example in each case.
iv. Write down the application of laser.
v. Define correspondence principle
vi. Why is the Heinsberg uncertainty principle not more radially apparent in our daily life?
vii. Why evacuated tube is used to examine photoelectric emission?
viii. Define the term thermal radiation.
ix. Briefly comment on energy time uncertainty relationship.
x. Define probability density.
xi. Explain the difference between nuclear fission and nuclear fusion reactions with example.
xii. What is ultraviolet catastrophe?
xiii. Write down the general nuclear reaction showing how atomic and mass number of an atom is affected with the emission of Alpha radiation.
xiv. Define the term threshold frequency in photoelectric effect
xv. State Mosley's law.

Answer the following questions

Q2. Define Compton effect. In a single photon-electron collision, show that Compton shift depends on scattering angle of photon. (10)

Q 3. (a) What are Lorentz transformations? Discuss the consequence of Lorentz transformation equation. (7)

(b) write down the postulates of special theory of Relativity. (3)

Q4. Differentiate between characteristic and continuous X-rays. How X-rays help to develop periodic table. (10)