UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program : First Semester – Fall 2021

Roll No. .....

Paper: Waves, and Optics **Course Code: PHYS-1002** **Time: 3 Hrs. Marks: 60**

Q.1. Answer the following short questions: (6x5=30)

i. Describe diffraction grating and derive an expression for the resolution of the diffraction-grating spectrograph.

ii. What are damped oscillations and different conditions under varying damping parameter? Also derive an expression for the damping power.

iii. Discuss simple harmonic motion of a body and find mathematical expressions for amplitude and phase.

iv. Elaborate the construction and operation of a Michelson interferometer, which is used to make precise measurements of wavelengths and of very small distances.

v. Discuss a simpler magnifier and derive an expression for its angular magnification.

vi. Give construction, operation and angular magnifications of typical telescope and microscope.

Q.2. Answer the following questions. (3x10=30)

a. Discuss Doppler effect of sound waves.

b. Describe Fraunhofer diffraction and diffraction from multiple slits.

c. Discuss and apply Huygens's principle to derive Snell's law.