School of Advanced Sciences
DEPARTMENT OF PHYSICS

Mid Term Test (MTT)

Question Paper- C2 SLOT(A)

B.Tech – Fall Semester-2020-21

Course: PHY1701- Engineering Physics

Time : 90 mins **Max Marks: 60**

Answer all Questions

1	What are matter waves? Derive the expression to find the wavelength of matter waves for a charged particle.	6	CO1
2	Demonstrate experimentally the wave like properties of electrons with suitable diagrams. Discuss the results.	6	CO1
3	An X-ray of wavelength 0.3 Å is scattered through an angle 60° by a free electron. Find the wavelength of scattered photon and energy of recoil electron.	6	CO1
4	Explain quantum tunneling and show how electron tunneling happens with the help of a band diagram.	6	CO2
5	Show that the minimum energy of a particle enclosed in one dimensional potential box of infinite height can't be zero.	6	CO2
6	What is attenuation? Discuss the sources of attenuation in optical fibers.	6	CO6
7	How optical fiber communication is better than conventional communication? Give the classification of optical fibers.	6	CO6
8	A 30 km long optical fiber having a fiber loss of 0.8 dB km is used in a communication link. If the input is 200 microwatts, what would be the output power?	6	CO6
9	Discuss the working principle of the PN junction diode.	6	CO7
10	A PIN photodiode has a quantum efficiency of 75% for photons of energy 1.65×10^{-19} J. Calculate the optical power required to achieve a photocurrent of 4 μA.	6	CO7