School of Advanced Sciences
DEPARTMENT OF PHYSICS

Mid Term Test (MTT)

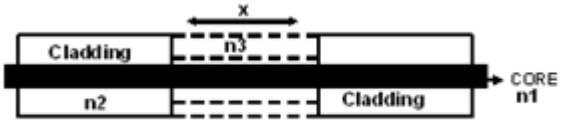
Question Paper- C1 SLOT(B)

B.Tech – Fall Semester-2020-21

Course: PHY1701- Engineering Physics

Time : 90 minutes **Max Marks: 60**

Answer All Questions

1	If the temperature of the sun is 6000K and that of the earth is 300K, find out the spectral region in which the radiations will be emitted by them. Justify the answer.	**6**	**CO1**
2	Can the particle in the box exist at two positions at the same time? Using the steady state Schrodinger equation and explain if this is possible?	**6**	**CO1**
3	What is Heisenberg's uncertainty principle? Using this show that in an atom the electron cannot exist in the nucleus.	**6**	**CO1**
4	Explain why in everyday life quantum effects can safely be ignored. When does the quantum effect become significant?	**6**	**CO2**
5	For a particle in a 3-D box write the Kinetic Energy operator in 3-D and set up the Schrodinger equation.	**6**	**CO2**
6	What are the conditions for light to experience total internal reflection when travelling through an optical fibre? Explain and justify your answer.	**6**	**CO6**
7	For an optical fiber of length - 1km, core refractive index, n1 = 1.5 and the ratio $(n_1-n_2)/n_2$ approximately 0.01, what will be the pulse broadening in nanoseconds per km? ($c = 3 \times 10^8$ m/s)	**6**	**CO6**
8	 Figure shows a fiber in which cladding is removed over a length x. n1 = 1.5, n2 = 1.4. What will happen to the output power if the bare portion is covered with a liquid with refractive index i) n3 = 1.5 ii) n3 = 1.4. Assume no dispersion losses.	**6**	**CO6**
9	An LED works in the forward bias while a photodetector works in the reverse bias. Explain graphically.	**6**	**CO7**
10	Which type of light source is good for transmission of light when using a single mode step indexed fibre? Justify your answer?	**6**	**CO7**