Nagar Yuwak Shikshan Sanstha's

Yeshwantrao Chavan College of Engineering

(An Autonomous Institution affiliated to Rashtrasant Tukadoji Maharaj Nagpur University)

Hingna Road, Wanadongri, Nagpur - 441 110

EVEN Term 2021-22 **24.08.22** Mid Semester Exam II

Second Semester B.Tech

AIDS2152 Applied Physics

Time: 1Hr 30 Min] **[Max Marks: 30**

INSTRUCTIONS TO EXAMINEES

1. **All questions are compulsory and figures to right indicate marks allotted, CO & Bloom's Level**
2. **Assume suitable data wherever necessary.**
3. **Illustrate your answers wherever necessary with the help of neat sketches.**
4. **Use of non-programmable calculator is permitted.**

List of constants: Plank's constant h = 6.625 X 10^{-34}J.s
Mass of electron me = 9.1 X 10^{-31}kg
Boltzmann constant k = 1.38 X 10^{-23} J/K
Mass of proton mp = 1.67 X10^{-27}kg
Charge e = 1.602 X 10^{-19}C
Velocity of light c = 3 x 10^{8} m/s

Q1	Solve the following	Max Mark	CO BLOOM 'S LEVEL
a)	Deduce an expression for acceptance angle and numerical aperture of optical fibre.	04	*CO3* PO1, L4
b)	Explain application of an optical fiber as a temperature sensor.	03	*CO3,* PO1, L2
c)	An optical fiber has a Numerical aperture of 0.2 and a cladding refractive index of 1.59. Determine: (i)The acceptance angle for the fiber in water which has a refractive index of 1.33. (ii) The critical angle at the core cladding	03	*CO3, PO2, L3*

	interface		
Q2	**Solve the following.**		
a)	Discuss the motion of an electron projected into uniform electric field at an acute angle with the field direction. Obtain expressions for Range, time of flight and maximum height attained by the particle	05	*CO4, PO1, L2*
b)	Sketch a well labeled block diagram of CRO.	02	*CO4, PO1 L2*
C)	An electron enters the region having **B = 0.2 k (tesla)** , The initial velocity is **(5 i+ 2 k) x 10 ^{7} m/s**. Calculate the pitch and radius of electron trajectory.	03	*CO4, PO2, L3*
Q3	**Solve the following**		
a)	Explain SOL GEL synthesis for producing nanomaterials with the help of neat sketch.	05	*CO5, PO2, L2*
b)	Mention the general applications of nanomaterials.	03	*CO5, PO1, L1*
c)	Highlight the properties of carbon nanotubes.	02	*CO5, PO1 L2*