Name. Student Admn. No.:			Printed Pages:01		
	[Programme: B.Sc.(Hon)] [Semester: IV)[Batch:1]				
Course Title: Perspectives of Modern Physics and Basic Electronics Course Code: C1UD401C			Max Marks: 100 Time: 3 Hrs.		
	2. Assume missing data suitably, if any.				
		K Level	COs	Marks	
	SECTION-A (15 Marks) 5 Marks each			I	
1.	The mass of moving electron is 11 times its rest mass. Calculate its kinetic energy and momentum	K1	CO1	5	
2.	Calculate the de-Broglie wavelength of an electron accelerated though a potentia difference of 100 volts	K1	CO3	5	
3.	Draw the circuit diagrams of a n-p-n transistor connection in CE mode. In a common emitter configuration, $I_b = 10\mu A$, and transistor amplification factor $\beta = 150$ Calculate the value of collector current (I_c) and current gain (α)		CO4	5	
	SECTION-B(40 Marks) 10 Marks e	ach			
4.	Prove the relation $E^2 - p^2 c^2 = m_0^2 c^4$, where p is the momentum, c speed of light, m ₀ rest mass and E is total energy	К2	CO1	10	
5.	Explain inertial and non inertial frames of reference. Discuss Galilean transformation for position, velocity and acceleration	K3	CO2	10	
6.	Describe theory and working of a R-C coupled voltage amplifier with the suitable or circuit diagram and analyze the frequency response curve of R-C coupled amplifier	f K3	CO3	10	
7.	Derive an expression for the time dilation on the basis of Lorentz transformation equations. Give an example to show that time dilation is a real effect	K4	CO4	10	
	SECTION-C (45 Marks) 15 Marks each				
8.	Discuss Compton effect. Derive an expression for Compton Shift. Explain why Compton's shift is not observed with visible light	K4	CO3	15	
9.	Analyze Einstein's quantum theory of photoelectric effect . Find maximum kinetic energy in eV of photo electrons if the work function of the material is 2.30 eV and frequency of radiation is 3.20×10^{15} Hz		CO4	15	
10	Describe the feedback mechanism of oscillators and derive the barkhausen criterion of sustained oscillation. Analyze the frequency of oscillation of Hartley oscillator	K5	CO4	15	