MANIPAL
ACADEMY *of* HIGHER EDUCATION
(Institution of Eminence Deemed to be University)

Reg. No.

DEPARTMENT OF SCIENCES, IV SEMESTER M. Sc. (Physics)
END SEMESTER EXAMINATION, APRIL 2023
THEORETICAL PHYSICS II [PHY-6015]
(CHOICE BASED CREDIT SYSTEM-2020)

Time: 3 Hours **Date: 28 April 2023** **MAX. MARKS: 50**

Note: (i) Answer all questions.
(ii) Answer the questions to the point.

Q. No.		Marks	CO	BL
1.	What do you mean by	2×5		I
(i)	normal ordering		CO2	
(ii)	projection operator		CO2	
(iii)	virtual particle		CO3	
(iv)	Fermi interaction		CO3	
(v)	propagator		CO2	
2.(i)	Discuss about the uncertainty principle for relativistic systems.	5	CO1	II
(ii)	Construct the projection operators for positive and negative energy states.	5	CO2	III
3.(i)	Write the Lagrangian and equations of motion in tensor form for electromagnetic fields.	3	CO4	I
(ii)	Explain the phase space factor in decay constant?	4	CO3	II
(iii)	What are Mandelstam variables?	3	CO3	I
4.	Construct the expression of propagator of electromagnetic fields.	10	CO4	V
5.	Prove that $i\frac{dU(t)}{dt} = H_I(t)U(t)$.	10	CO3	V