



Reg.No. _____

End Semester Examination – Nov/Dec – 2016

Code : 15PH3011

Sub. Name : QUANTUM MECHANICS II

Semester : 2016-17 ODD

Duration : 3hrs

Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions		Marks
1.	a.	Discuss briefly the time dependent perturbation theory and derive the expression for the transition probability to a group of states per unit time.	CO1	(20)
		(OR)		
2.	a.	Discuss in detail about the scattering cross section and scattering amplitude and obtain the relation between them.	CO1	(14)
	b.	What happens to the system when the perturbation is turned on very slowly? Explain.	CO1	(6)
3.	a.	Explain Born approximation? Show that Born approximation is likely to be valid for weak potential.	CO1	(14)
	b.	Green's function is a solution of the scattering problem for a source of unit strength at a particular point. Discuss.	CO1	(6)
		(OR)		
4.	a.	Obtain an expression for the differential scattering cross-section and total elastic cross-section by applying the partial wave analysis method.	CO1	(20)
5.	a.	How will you obtain the scattering cross section for a coulomb potential on the basis of the scattering theory.	CO1	(16)
	b.	What do you mean by Yukawa potential? Discuss.	CO1	(4)
		(OR)		
6.	a.	Explain in detail about the spontaneous and induced emission of radiation on the basis of semi classical theory of radiation.	CO2	(20)
7.	a.	In detail explain and derive the relativistic equation for a freely moving particle using the Dirac concept.	CO2	(20)
		(OR)		
8.	a.	Give an account on the following (i) Dirac particle in the electromagnetic field (ii) Negative energy states	CO2	(20)
		Compulsory:		
9.	a.	Explain in detail about the quantization of radiation field.	CO2	(20)