

--	--	--	--	--	--	--	--	--	--



**GIET UNIVERSITY, GUNUPUR – 765022**  
M. Sc. (Fourth Semester) Examinations, May' 2021  
**PHPC 402 – ELEMENTARY PARTICLE PHYSICS**  
(Physics)

Time: 2 hrs

Maximum: 50 Marks

(The figures in the right hand margin indicate marks.)

**PART – A****(2 x 10 = 20 Marks)**

Q.1. Answer all the questions

- a. What is photon?
- b. Why does a free neutron not decay into an electron and positron?
- c. What is isospin quantum number?
- d. How can elementary particles decay?
- e. What does additive quantum number mean?
- f. What is time reversal invariance?
- g. Write about SU(2) and SU(3) symmetry.
- h. Explain the baryon decuplet.
- i. What is the quark theory?
- j. Differentiate meson and baryon.

**PART – B****(6 x 5 = 30 Marks)**Answer ANY FIVE questions

Marks

2. Write a detailed note on the classification of elementary particles. What are leptons, hyperons and baryons? (6)
3. What is strangeness quantum number? In what type of interaction, it is conserved? (6)
4. Discuss the charge independence of nuclear forces. (6)
5. Explain the conservation laws in relation to particle reactions and decays. (6)
6. What is parity? Discuss the parity in quantum mechanics and field theory. (6)
7. Discuss the charge conjugation theory. (6)
8. Explain what is meant by “Eight fold way”? What is its importance in the classification of particles? (6)
9. Write the concepts of I-spin, U-spin and V-spin. (6)

--- End of Paper ---