Enrollment No: _____ Exam Seat No: _____

C.U.SHAH UNIVERSITY

Summer Examination-2018

Subject Name: Nuclear Physics and Particle Physics

Subject Code: 4SC06NPC1 Branch: B.Sc. (Physics)

Semester: 6 Date: 27/04/2018 Time: 2:30 To 5:30 Marks: 70

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 Attempt the following questions: (14)

a) Define Elementary Particles.
b) Give the expression for Betatron Conditions.
c) State two advantages of GM counter.
d) Define Q-value in nuclear reactions.
e) Write at least 3 types of nuclear reactions possible.
f) State one point of difference between Particles and Anti-Particles.
g) Define Strangeness Quantum Number.
h) State the use of moderators in nuclear reactors.
i) Write the possible Nuclear Fission expression for $_{92}U^{235}$
j) What do you mean by Nuclear Transmutation?
k) Write the basic principle on which Particle Accelerators work.
l) Give the main processes by which radiations interact with matter.
m) Write the full form of PMT.
n) Which particles belong to the group Hyperons?

Attempt any four questions from Q-2 to Q-8

Q-2 Attempt all questions (14)

a Explain the construction and working of Betatron. **07**
b Write a note on interaction between energetic particles with matter. **07**

Q-3 Attempt all questions (14)

a Describe in detail Proton Synchrotron. **07**
b Explain in detail how Solid State Detectors works. **07**

Q-4 Attempt all questions (14)

a Enumerate on GM counter. **08**
b Discuss: Scintillation detector. **06**

Q-5		**Attempt all questions**	**(14)**
	a	Derive the expression for the Q-value for a nuclear reaction.	**07**
	b	Compare Pressurized Water Reactor with Boiling Water Reactor.	**07**
Q-6		**Attempt all questions**	**(14)**
	a	Describe Nuclear Reactor in detail.	**07**
	b	How does Liquid Drop Model helps to understand Nuclear Fission process? Explain.	**07**
Q-7		**Attempt all questions**	**(14)**
	a	Explain in detail the fundamental interactions between elementary particles.	**07**
	b	Describe in detail: Quarks.	**07**
Q-8		**Attempt all questions**	**(14)**
	a	Discuss in detail the Quark Model.	**07**
	b	Write a note on the classification of elementary particles.	**07**