Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name : Nuclear Physics and Particle Physics

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

Semester : 6 **Date :17/04/2017** **Time : 02:30 To 05:30** **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) Write working principle of accelerator. 01
b) Define: quarks 01
c) If 'Q' is positive ,the nuclear reaction will be? 01
d) Write about main types of the nuclear reactions. 01
e) How ionization chamber can works? 01
f) Write statement of conservation of charge. 01
g) What is nuclear fission process? 01
h) Write example of nuclear fusion process. 01
i) How many groups of elementary particles? 01
j) The term 'Q' represents in nuclear reaction is_____. 01
k) Distinguish particles and antiparticles. 01
l) What is artificial transmutation? 01
m) State applications of detectors. 01
n) Define: threshold energy. 01

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

Q-2 **Attempt all questions** **(14)**

a) Obtain the threshold energy for an endoergic reaction in the nuclear reaction. 04
b) Discuss energy balance in nuclear reaction and Q-value. 05
c) What is synchrocyclotron?-Discuss. 05

Q-3 **Attempt all questions** **(14)**

a) What is proton synchrotron? Discuss briefly its construction and working. 07
b) Discuss construction and working of Geiger-Muller counter. Write its advantages. 07

Q-4 **Attempt all questions** **(14)**

a) What is quantum numbers? Discuss brieflyelementary particle quantum numbers. 07
b) Explain the construction and working of Betatron. Write its advantages. 07

Q-5		**Attempt all questions**	**(14)**
	a)	What is thermonuclear reactions? Explain it with suitable examples.	07
	b)	Discuss briefly construction and working of Scintillation Counters.	07
Q-6		**Attempt all questions**	**(14)**
	a)	Discuss briefly about various types of conservation laws and symmetry of elementary particles with suitable examples.	07
	b)	What is plasma? Explain plasma confinement in detail.	07
Q-7		**Attempt all questions**	**(14)**
	a)	Discuss fast breeder reactor.	05
	b)	Discuss boiling water reactor.	05
	c)	State transmutation of nuclear by α particle.	04
Q-8		**Attempt all questions**	**(14)**
	a)	How pressurized water reactor works? Explain.	05
	b)	Discuss solid state detectors.	05
	c)	Write a short note on atom bomb with its advantages and disadvantages.	04