

C.U.SHAH UNIVERSITY

Summer Examination-2016

Subject Name : Nuclear Physics and Particle Physics

Subject Code :4SC06NPC1

Branch :B.Sc.(Physics)

Semester : 6

Date :09/05/2016

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) Define: accelerator.	01
	b) What is artificial transmutation?	01
	c) If 'Q' is negative, what will be the nuclear reaction will be?	01
	d) Enlist the main types of the nuclear reactions.	01
	e) Give the applications of Ionization chamber.	01
	f) Write statement of conservation of charge.	01
	g) Define: nuclear fission.	01
	h) Define: nuclear fusion.	01
	i) Write groups of elementary particles.	01
	j) What is the term 'Q' represents in nuclear reaction?	01
	k) What is threshold energy?	01
	l) What are quarks?	01
	m) State applications of detectors.	01
	n) Define: particles and antiparticles.	01

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

Q-2	Attempt all questions	(14)
	a) Determine the threshold energy for an endoergic reaction in the nuclear reaction.	04
	b) Explain the energy balance in nuclear reaction and Q-value.	05
	c) Discuss synchrotron.	05
Q-3	Attempt all questions	(14)
	a) Explain in brief about the construction and working of proton synchrotron.	07
	b) Explain the construction and working of Geiger-Muller counter.	07
Q-4	Attempt all questions	(14)
	a) Explain the construction and working of Scintillation Counters.	07



	b) Explain the construction and working of Betatron.	07
Q-5	Attempt all questions	(14)
	a) Discuss in brief thermonuclear reactions in brief.	07
	b) Discuss in brief elementary particle quantum numbers.	07
Q-6	Attempt all questions	(14)
	a) Explain in brief various conservation laws and symmetry of elementary particles with suitable example.	07
	b) Discuss plasma confinement in detail.	07
Q-7	Attempt all questions	(14)
	a) Explain pressurized water reactor.	05
	b) Discuss boiling water reactor.	05
	c) Describe transmutation of nuclear by α particle.	04
Q-8	Attempt all questions	(14)
	a) Write short note on fast breeder reactor.	05
	b) Discuss solid state detectors.	05
	c) Write a short note on atom bomb.	04

