****

**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**Plot 91, Cadastral Zone, NnamdiAzikiwe Expressway, Jabi, Abuja**

**FACULTY OF SCIENCE**

**2016\_2 EXAMINATION**

**COURSE CODE:PHY401**

**COURSE TITLE: ELEMENTARY PARTICLE PHYSICS**

**COURSE UNIT: 3 units**

**TIME: 3 hours**

**INSTRUCTION: Answer *; Answer any Five (5) questions***

1a. State the Law of conservation of Baryon number and how it explains the proton stability.

**7 marks**

b. List the members of the Bosons group. **2 marks**

c. . Using Testing reaction equations show whether the reaction between a proton and neutron

will give two protons and a negative pion

P+n→ P+P+π͞ **5 marks**

2a. List the groups and families of Elementary particles. **3 marks**

b. Elementary particles are classified into groups and families according to what properties?

**7 marks**

c. Define Linear momentum of a Particle **4 marks**

3a. What are Hadrons? **6 marks**

b. Define Angular Momentum of a particle?**3 marks**

c. Using Testing Reaction equations show whether the following equation can occur in nature.

P+n→π+ + π°**5 marks**

4a. State the Law of the Conservation of angular momentum.**3 marks**

b. What is strangeness of a particle.**5 marks**

c. List the four different types of Interactions we have in particle physics.**4 marks**

d. Define C Parity.**2 marks**

5a. Draw a Table showing the intermediate bosons according to their families with the following properties: symbol, charge and spin.**7 marks**

b. Define Net Parity of a system.**2 marks**

c. State the Conservation law of Charge and describe it using examples. **4 marks**

6a. Differentiate between a Lepton and a Meson, giving names of particles and their properties.

**4 marks**

b. Differentiate between ODD and EVEN PARITY**5 marks**

c. List five gaseous ionization and solid state detectors of elementary**5 marks**

7a. Write short notes on the concept of C Parity and G Parity.**5 marks**

b. Consider a particle with charge e moving in a uniform electric field E. The force on the particle is eE. If r is the position of the particle then the equation of motion of the particle is given by

Transform this equation of motion under parity.**6 marks**

c. What do you understand by the SU(2) Model?**3 marks**