****

**NATIONAL OPEN UNIVERSITY OF NIGERIA**

**Plot 91, Cadastral Zone, Nnamdi Azikiwe Expressway, Jabi, Abuja**

**FACULTY OF SCIENCE**

**JULY 2017\_1 EXAMINATION**

**COURSE CODE:PHY401**

**COURSE TITLE: ELEMENTARY PARTICLE PHYSICS**

**COURSE UNIT: 3 units**

**TIME: 3 hours**

**INSTRUCTION:  *Answer question One and any other Four (4) questions***

1a. Differentiate between a Lepton and a Meson, listing all the names of associated 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 particles you know

 **5 marks**

2a. 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

$$m\frac{d^{2}r}{dt^{2}}=eE$$

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

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

3a. 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**

4a. List the two groups andassociated 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**

5a. 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**

6a. 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**