NATIONAL OPEN UNIVERSITY OF NIGERIA
University Village, Nnamdi Azikiwe Expressway, Plot 91, Cadastral Zone, Jabi, Abuja
FACULTY OF SCIENCES

JANUARY/ FEBRUARY 2018 EXAMINATION

COURSE CODE: PHY 456
COURSE TITLE: NUCLEAR REACTOR PHYSICS

COURSE UNIT: 3 Credit Units

TIME DURATION: 3 HOURS

Instructions: ***Answer One (1) and any other four (4) questions.***

1. a) What is Neutron Moderation? And how does it achieved? (4 marks)
   b) State Fick's Law. (3 marks)

   c) What are the classes of nuclear reactors? (3 marks)
   d) Briefly explain any four components of nuclear reactor. (11 marks)

2. List and briefly explain the different ways by which neutrons can interact with nuclei. (1***2 marks)***

3. a) Define the following terms: (***6 marks)***
   i. cross section
   ii. absorption cross section
   iii. macroscopic cross section
   b) List and briefly explain the frames of references considered for neutron moderation. (***6 marks)***
4. Briefly explain the equation of continuity. (1***2 marks)***

5. a) State the diffusion equation and explain what each term of the equation stands for. (***6 marks)***
   b) What are the conditions imposed on the diffusion equation to get the neutron flux? (***6 marks)***
6. a) Distinguish between nuclear fission and nuclear fusion. (5 marks)

   b) Give each of Nuclear fission and fusion their nuclear equations. (8 marks)