NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI - ABUJA
FACULTY OF SCIENCE
DEPARTMENT OF PURE AND APPLIED SCIENCE
2020_1 EXAMINATION

COURSE CODE: CHM426
COURSE TITLE: CHEMISTRY OF LANTHANIDES AND ACTINIDES
CREDIT: 2 Units
TIME ALLOWED: 2 Hours
INSTRUCTION: Answer Question ONE (1) and any other Three (3) Questions

Question 1
a) List any four general physical properties of the lanthanide elements (4 marks)
b) State any 4 general chemical properties of lanthanides (6 marks)
c) Discuss the electronic configuration of lanthanide elements (6 marks)
d) Explain the stability of the various oxidation states of lanthanides (5 marks)
e) Explain what happened when lanthanide absorbed CO_2 (4 marks)
Total = 25 marks

Question 2
a) Describe the uses of lanthanides complexes in the medical industries (5 marks)
b) Discuss the metallic properties of lanthanides (5 marks)
c) Explain the chemistry behind the formation of uranium oxides (5 marks)

Question 3
Discuss the followings;
a) Account for the similarities in properties between lanthanides and yttrium (5 marks)
b) Compare and contrast the properties of lanthanides and actinides (10 marks)

Question 4
a) List the principal ore and hence, highlight two extraction or purification methods for lanthanides (7 marks)
b) Discuss briefly three effects of the lanthanide contraction (5 marks)
c) show the equation for the combustion of 2 lanthanide metals (3 marks)

Question 5

a) Discuss on the magnetic and spectral properties of the lanthanide elements (5 marks)
b) Discuss the coordination number and stereochemistry of the lanthanide elements (5 marks)
c) Explain the concept of lanthanide contraction (5 marks)