



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI-ABUJA
FACULTY OF COMPUTING
DEPARTMENT OF COMPUTER SCIENCE
2024_2 EXAMINATION

COURSE CODE : CIT 335
COURSE TITLE : Computational Science and Numerical Methods
CREDIT UNIT : 3
TIME ALLOWED : 2½ HOURS
INSTRUCTION : Answer Question 1 and any other Three Questions

- 1a) Convert 11100.001_2 to Decimal equivalents [5 mks]**
1b) Mention and briefly describe the function of Arithmetic Operators used in Programming[6mks]
1c) Mention any three sources of error in computations [3 marks]
1d) Chop the following numbers to 3 decimals: [2 marks]
1e) With the aid of suitable equations, state any three properties of the inner product [5 marks]
1f) Write short notes on the following numbers [4 marks]
- 2a) Describe the IEEE Standard for Floating-Point Arithmetic (IEEE 754) [4 marks]**
2b) Converter 7777_8 to decimal [4 marks]
2c. Convert the following numbers to base 10: [7 marks]
- 3a) Explain the varieties of machine Numbers you know [4mks]**
3b) Convert the following binary numbers to base 10 [7 marks]
3c: What is computer arithmetic? [4mks]
- 4a) What are Real numbers? [3 marks]**
4b) List any four sources of error in computations [4 marks]
4c) Convert the following binary numbers to base 10 [7 marks]
4d) Round the following numbers to 4 decimals: [1 mark]
i) $6.322556 = 6.3236$,
- 5a) Convert the $(110.101)_2$ to base 10: [7 marks]**
5b) Mention any two kinds of machine numbers? [1½ mark each, total = 3 marks]
- 5c) Represent the binary number system as real numbers, with the aid of a suitable equation? [5 marks]**
- 6a) Briefly describe any two of the following:**

i) Well-conditioned problem, ii) Well-conditioned problem, iii) the *condition number* of a problem [4 marks]

6b) Write short notes on the following terms: Interpolation, Algorithm [4 marks]

6c) Convert the following numbers to base 10 equivalent: [7 marks]
i) $(100011)_2$ ii) $(21A)_{16}$

