

NATIONAL OPEN UNIVERSITY OF NIGERIA

PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSSWAY, JABI-ABUJA

FACULTY OF COMPUTING DEPARTMENT OF COMPUTER SCIENCE

2024_2 EXAMINATION_

COURSE CODE: CIT308

COURSE TITLE: FORMAL METHODS AND SOFTWARE DEVELOPMENT

COURSE CREDIT: 3 UNITS

TIME ALLOWED: 2 HOURS

INSTRUCTION: ANSWER QUESTION 1 AND ANY OTHER THREE QUESTIONS

Q1 (a)	Mention 8 characteristics for system description		
(b)	Drow a lavel 0 data flow diagram for bosnital management system?	4 marks	
(0)	Draw a level o data now diagram for nospital management system?	5 marks	
(c)	Construct a truth table for the formula $\neg(x \lor y) \leftrightarrow ((\neg x \land y) \lor z)$	6 marks	
(d)	Discuss the 4 types of software maintenance you know?	8 marks	
(e)	List 4 software requirement characteristics?	2 marks	
Q2 (a) Suppose x is a real number. Consider the statement "If $x^2=4$, then $x=2$." Construct the converse, the inverse, and the contrapositive. Determine the truth or falsity of the four statements (1) the original statement, (2) the converse, (3) the inverse, and (4) the contrapositive; using your knowledge of algebra.			
(b)	Discuss the NOT and IF AND ONLY IF connectives?	8 marks	
(c)	What advantages do structure charts have over DFD?	6 marks	
		1 mark	
Q3. (a)	Discuss the unit, system and user acceptance testing?	5 mortes	
(b)	Mention 3 types of formal methods in Software Development?	5 marks	
(c)	List 6 application specific GUI components	3 marks	
(-)		6 marks	

Q4 (a)	Tabulate the strength and weakness of the water-fall model?	
(u) (1)		6 marks
(b)	Using a diagram, highlight the data flow diagram symbols	3 marks
(c)	Mention 6 characteristics for system description	2 martes
(d)	Distinguish between modular programming and structured coding?	J mai ks
		3 marks
Q5 (a) provid	Given: $A = \{1, -2, 5, 7, 9, 10\}; B = \{2, 3, 5, 8, 3\}$ and $C = \{5, 4, 6, 8, 10\}$. Describe results for $(A \cup B) \cap C$ and $(B \cup C) \cup A$	ibe and
(1)		8 marks
(b)	Discuss formal specification as a precursor to software development?	3 marks
(c)	Discuss the importance of software documentation?	4 marks
Q6. (a)	Why do we study software development?	
(h)	Outline any 6 benefits of using formal methods in software development?	2 marks
(0)	Summe any 5 senemes of using formal methods in software development:	3 marks
(c)	With a diagram, describe the distinction between HIPO and IPO chart?	10 marks