UNIT TEST 05
2027 A/L ICT

Become a Tech-Savvy Entrepreneur

STUDENT ID
NAME
DATE

1. In an eight-bit system the high-order bits _____.
(1) are on the left.
(2) have lesser magnitude than low-order bits.
(3) are on the right.
(4) are on the right and have lesser magnitude than low-order bits.
(5) none of the above

2. The binary subtraction 1 -1 = _____
(1) difference =1 borrow =0 (2) difference =0 borrow =1
(3) difference =1 borrow =1 (4) difference =0 borrow =0
(5) All of the above

3. The binary addition 0 + 1 = _____
(1) sum = 0 carry = 1 (2) sum = 1 carry = 1
(3) sum = 0 carry = 0 (4) sum = 1 carry = 0
(5) All of the above

4. The binary addition 1+ 0 + 0 = _____
(1) sum = 1 carry = 1 (2) sum = 1 carry = 0
(3) sum = 0 carry = 0 (4) sum = 0 carry = 1
(5) All of the above

5. Consider the two binary numbers E = 10000000 and F = 00001111. If **G = E - F**, what will be the value of G?
(1) 01110001 (2) 10000000 (3) 01111111
(4) 10000001 (5) 10011101

6. Consider the two binary numbers A = 01110000 and B = 00011000. If **C = A - B**, what will be the value of C?
(1) 01101000 (2) 01010000 (3) 01011000
(4) 00011000 (5) 10011001

7. Consider the two binary numbers A = 00010111 and B = 00101001. If **C = A + B**, what will be the value of C?
(1) 01000000 (2) 00101111 (3) 01100000
(4) 00110011 (5) 00100010

8. Consider the two binary numbers A = 01110010 and B = 01001000. If **C = A - B**, what will be the value of C?
(1) 00011010 (2) 00111100 (3) 00101010
(4) 01110010 (5) 00000010

9. Consider the two binary numbers L = 01101110 and M = 00100010. If **N = L + M**, what will be the value of N?
(1) 10010000 (2) 11001001 (3) 01101110
(4) 01110110 (5) 01000110

10. Consider the two binary numbers A = 11001111 and B = 01110000. If **C = A - B**, what will be the value of C?
(1) 10001111 (2) 01111111 (3) 01101111
(4) 01011111 (5) 01010011

11. What is the decimal value of 2^1?
(1) 1 (2) 4 (3) 2 (4) 0 (5) 0.5

12. What is the decimal value of 2^{-1}?
(1) 0.1 (2) 0.25 (3) 0.5 (4) 0.05 (5) 0.75

13. The binary addition of 1 +1 +1 +1 =_____.
(1) 0001_2 (2) 1001_2 (3) 0100_2 (4) 1111_2 (5) 1101_2

14. Which binary value equals 2^{-1}?
(1) 1.0000 (2) 0.0010 (3) 0.0001
(4) 0.1000 (5) 0.0101

15. Convert the binary number 10101110.11000000 to decimal.
(1) 175.65 (2) 174.875 (3) 175.55
(4) 174.75 (5) 174.652

16. The binary subtraction of 10110010 − 10100100 = _____.
(1) 00001110 (2) 00001010 (3) 00010100
(4) 00001011 (5) 00001001

17. The octal addition of 157 + 64 = _____.
(1) 235 (2) 244 (3) 243 (4) 251 (5) 263

18. The octal addition of 725 + 72 = _____.
(1) 1007 (2) 1117 (3) 1015 (4) 1017 (5) 1027

19. The octal subtraction of 640 − 157 = _____.
(1) 471 (2) 463 (3) 551 (4) 460 (5) 461

20. The hexadecimal number for $(95.5)_{10}$ is _____.
(1) $(5F.8)_{16}$ (2) $(9A.B)_{16}$ (3) $(2E.F)_{16}$ (4) $(5A.4)_{16}$ (5) $(2F.8)_{16}$

21. The hexadecimal equivalent of a binary 10100101 is _____.
(1) $A4_{16}$ (2) $A5_{16}$ (3) $C3_{16}$ (4) $B5_{16}$ (5) $A3_{16}$

22. Which binary value equals $4EA_{16}$?
(1) 01000001100 (2) 10111000010 (3) 10010001010
(4) 10000100000 (5) 10011101010

23. The hexadecimal addition of 2A + 3F = _____.
(1) 6A (2) 68 (3) 59 (4) 79 (5) 69

24. The hexadecimal addition of 7C9 + A3 = _____.
(1) 86B (2) 96C (3) 87C (4) 85C (5) 86C

25. The hexadecimal subtraction of 1F4 − 9B = _____.
(1) 151 (2) 149 (3) 169 (4) 158 (5) 159

26. The hexa-decimal equivalent for the addition of 277_8 and 66_8 is,
(1) E5 (2) F5 (3) D4 (4) F6 (5) E6

27. The binary equivalent for the addition of 576_8 and 4567_8 is,
(1) 101011111101 (2) 111011110101 (3) 101011111101
(4) 101011110101 (5) 100011110101

28. The decimal equivalent for the addition of 345_8 and 123_8 is,
(1) 312 (2) 314 (3) 212 (4) 313 (5) 213

29. The hexa-decimal equivalent for the subtraction of 654_8 and 345_8 is,
(1) D7 (2) D8 (3) C7 (4) C6 (5) C8

30. The binary equivalent for the subtraction of 666_8 and 255_8 is,
(1) 101101001 (2) 100001001 (3) 111101001
(4) 100011001 (5) 100000001

31. The decimal equivalent for the subtraction of 654_8 and 467_8 is,
(1) 114 (2) 115 (3) 116 (4) 117 (5) 118

32. The octal equivalent for the addition of $A1_{16}$ and FD_{16} is,
(1) 635 (2) 636 (3) 536 (4) 535 (5) 534

33. The decimal equivalent for the addition of $C9_{16}$ and $E6_{16}$ is,
(1) 331 (2) 341 (3) 430 (4) 441 (5) 431

34. The binary equivalent for the addition of $C2_{16}$ and $C1_{16}$ is,
(1) 011110001011 (2) 000110011111 (3) 000110000010
(4) 000110110011 (5) 000110000011

35. The octal equivalent for the subtraction of the $F1_{16}$ and $6B_{16}$ is,
(1) 204 (2) 206 (3) 205 (4) 175 (5) 208

36. The decimal equivalent for the subtraction of the 876_{16} and 456_{16} is,
(1) 1055 (2) 1052 (3) 1054 (4) 1053 (5) 1056

37. The binary equivalent for the subtraction of the $45C_{16}$ and $21B_{16}$ is,
(1) 1001000001 (2) 1001001101 (3) 1001000101
(4) 1001000011 (5) 1001000111

38. The binary equivalent for the subtraction of decimal 567_{10} and 234_{10} is,
(1) 101101101 (2) 101001101 (3) 101111101
(4) 101001100 (5) 101101101

39. The octal equivalent for the subtraction of decimal 999_{10} and 639_{10} is,
(1) 550 (2) 560 (3) 650 (4) 551 (5) 576

40. The hexa-decimal equivalent for the subtraction of decimal 765_{10} and 434_{10} is,
(1) 13B (2) 14A (3) 12C (4) 13A (5) 14B

41. The addition of 276_8 and binary 10110001_2 in decimal is,
(1) 366 (2) 367 (3) 377 (4) 365 (5) 376

42. The addition of 11110110_2 and hexa-decimal $1A_{16}$ is in decimal,
(1) 270 (2) 271 (3) 275 (4) 272 (5) 273

43. The addition of 774_8 and hexa-decimal AB_{16} in decimal is,
(1) 678 (2) 786 (3) 679 (4) 680 (5) 677

44. The subtraction of hexa-decimal $A9C_{16}$ and decimal 431_{10} in decimal is,
(1) 2285 (2) 2284 (3) 2283 (4) 2286 (5) 2287

45. The subtraction of octal 6231_8 and binary 11010010_2 in decimal is,
(1) 3010 (2) 3013 (3) 3014 (4) 3012 (5) 3015

46. The binary representation of the addition of octal 675_8 and hexa-decimal 675_{16} is,
(1) 100000110010 (2) 100000110110 (3) 100000111010
(4) 100011110010 (5) 111000110010

47. The decimal representation of the addition of the binary 11110111_2 and decimal 7986_{10} is,
(1) 8232 (2) 8233 (3) 8231 (4) 8234 (5) 8235

48. The octal representation of the addition of decimal 567_{10} and hexa-decimal $65A_{16}$ is,
(1) 4220 (2) 4223 (3) 5224 (4) 4221 (5) 4222

49. The hexa-decimal representation of the subtraction of decimal 4566_{10} and binary 10111111_2 is,
(1) 1116 (2) A111 (3) 1118 (4) 11F (5) 1117

50. The binary representation of the subtraction of the 670_8 and 238_{10} is,
(1) 11001110 (2) 10101110 (3) 11101110
(4) 11101111 (5) 11001010

PART II
Structured Essay

1. (a) You rent a virtual computer from **Amazon EC2** to practice installing operating systems, setting up servers, or running heavy simulations for your ICT project. You decide the OS, memory size, and software, while AWS handles the hardware, electricity, and maintenance.

(i) Which type of cloud service is being provided in the above scenario?
……

(ii) You need to develop a small web app for your coursework. For that purpose you use **Heroku** or **Google App Engine** to upload the code. You don't need to manage servers or databases — you just focus on writing and testing your program. Which type of cloud service is being used here?
……

(iii) You use **Google Docs** or **Canva** directly through your web browser to type assignments or design posters. Which type of cloud service is being used here?
……

(b) **Bob**, a university student, stores his project files and personal documents on a free cloud storage account. One day, he receives an email that looks like it's from the cloud provider asking him to "verify his login details." Without checking carefully, he enters his username and password through the link in the email. A few hours later, he logs into his account and finds out that some of his confidential documents — including his research work are missing.

(i) What is the technical issue that has occurred in the above scenario, due to the use of cloud services?
……

(ii) Suggest two methods to avoid such situations, while using cloud services.
……
……

(iii) Write three advantages of using a cloud service.
……
……
……

2. (a) Read the following two scenarios carefully.

1 – When scientists at a pharmaceutical company are developing a new medicine, they need to test millions of possible chemical combinations to see which ones could work safely in the human body. Instead of relying on one powerful computer, the company connects many computers located in different branches and laboratories. Each computer takes a small portion of the research data and performs calculations on it. Once every computer finishes its assigned task, all results are combined to form a complete analysis. This approach allows the company to finish large-scale experiments in a fraction of the time it would take on a single computer.

2 – A 3D animator is creating a realistic movie scene using special software. Rendering one frame of the scene requires complex calculations — lighting, shadows, reflections, and textures. Instead of one processor handling everything step by step, the computer divides the rendering work into smaller pieces

and lets multiple processors work on them at the same time. Once each part is done, the system merges them to form the complete final image. This helps the designer finish animations much faster and keep up with production deadlines.

(i) Identify the type of computing method used in scenario 1.
……

(ii) Mention two advantages of using this computing method in the given situation.
……
……

(iii) Mention one drawback of using this computing method in the given situation.
……

(iv) Identify the type of computing method used in scenario 2.
……

(v) Mention one advantage of using this computing method in the given situation.
……

(vi) Mention two drawbacks of using this computing method in the given situation.
……
……

(b) Simply explain the function of the following terms, based on the fetch-decode- execute cycle.

(i) Fetch – ……
(ii) Decode – ……
(iii) Execute – ……

3. (a) Copy down the following table to your answer sheet and complete it.

Binary	Octal	Decimal	Hexa-Decimal
101010110			
			C16
		999	
	34562		

(b) Answer the questions below according to the following paragraph.
Mala took an amount of 01111110_2 rupees to the shop and bought two mangoes for 25.50 rupees and a pineapple for 62_8 rupees.
(i) Calculate the amount that Mala took to the shop, in base 8.
(ii) Calculate the value of mangoes bought by Mala in hexa-decimal.
(iii) Calculate the price of a pineapple in binary.
(iv) Add the total amount she spent on fruits, in binary.

PART II
Essay Type

1. (a) This is a part of a excel sheet of a salary sheet.

Salary Sheet - January 2023					
Employee Name	Emp No.	Basic Salary	OT hours	OT amount	Net Salary
Mr. N.S. Perera	E1235	Rs. 58,000.00	24	24000	Rs. 82,000.00
Mr. N.S. Silva	E3476	Rs. 65,500.00	21	21000	Rs. 86,500.00
Mr. Gamini Fernando	E2376	Rs. 58,000.00	0	0	Rs. 58,000.00
Mr. Amantha Silva	E6543	Rs. 62,000.00	20	20000	Rs. 82,000.00
				Total Salary	Rs. 308,500.00

(i) Write down one qualitative data and quantitative data from the above sheet.
(ii) According to this sheet, list down two information, that is going to be processed by this sheet.
(iii) The company is going to develop a new system to Human resource management. Write down two data gathering techniques.
(iv) Instead of a manual signed sheet, they are going to introduce a fingerprint reader. Write down two advantages of direct data input methods rather than keyboard.

b) Saman used his desktop computer to do online classes. But sometimes he understood that his computer speed is not adequate to do his work.
(i) Write down two suggestions that you would do to increase the performance of the computer.
(ii) Saman uses a CRT monitor. Write down two disadvantages of using CRT.
(iii) CRT can be considered as e-waste. Write down a solution to mitigate e-waste.
(iv) Write down what is meant by digital divide.
(v) Write down two ways to mitigate digital divide.

2. (a) (i) Draw the fetch – execute cycle and briefly describe each unit.
(ii) Write 3 registers that are often active during fetch-decode-execute and write their functions separately.

(b) (i) Write 2 differences between Level 1, Level 2, and Level 3 cache.
(ii) What are the main components of the Von-Neumann architecture?

(c) Give examples for each of the following:
(i) Parallel computing
(ii) Grid computing
(iii) Multi-core processing

(d) Match each of the given sentences (i) – (v) relating to computer registers with the most suitable item from the list below.
List = [Program Counter (PC), Accumulator Register (ACC), Memory Buffer/Data Register (MBR/MBR), Memory Address Register (MAR), Current Instruction register (CIR)]
i. _____an incrementing counter that keeps track of the next memory address of the instruction that is to be executed once the execution of the current instruction is completed.
ii. _____ the address in main memory that is currently being read or written
iii. _____ a two-way register that holds data fetched from memory (and ready for the CPU to process) or data waiting to be stored in memory.
iv. _____ a temporary holding ground for the instruction that has just been fetched from memory.
v. _____ is used for storing data for ALU to process and the results those are produced by the ALU.