

CHRISTIAN SOCIAL SERVICES COMMISSION (CSSC)
NORTHERN ZONE JOINT EXAMINATIONS SYNDICATE (NZ-JES)



FORM SIX PRE – NATIONAL EXAMINATION 2026

136/1

COMPUTER SCIENCE 1

Time: 3 Hours

Tuesday, 3rd March 2026p.m

Instructions

1. This paper consists of two sections A and B with a total of **ten (10)** questions.
2. Answer **all** questions in section A and any **two (02)** questions from section B.
3. Section A carries **seventy (70)** Marks and section B carries **thirty (30)** marks.
4. All writing must be in **blue** or **black** ink, except diagrams which must be in pencil.
5. Cellular phones and any unauthorized materials are not allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet(s).

SECTION A (70 MARKS)

Answer **all** questions from this section.

1. Your computer suddenly slows to a crawl, applications crash without warning, or your phone gets stuck in a reboot loop. Before you consider a factory reset or a lengthy hardware diagnosis, there is a powerful, built-in diagnostic tool that can help you pinpoint the problem quickly and efficiently.
 - (a) Mention the tool and explain how and why can we use the tool in different devices for trouble shooting? **(5 marks)**
 - (b) (i) Every computer must have at least one operating system to run other programs and it need some environment to run and perform its task. What is the relationship between operating systems and computer hardware? **(2 marks)**
(ii) By listing two function of each. What are the different between microprocessor and microcontroller? **(3 marks)**
2. You are working as a junior digital electronics technician in a hardware design company. Your supervisor assigns you to design a Full Adder circuit that will later be used as part of an 8-bit arithmetic unit. The supervisor informs you that you must design the full adder from scratch, you are required to;
 - (a) Construct the truth table for a full adder, showing the outputs SUM (S) and CARRY-OUT for all possible combinations of the three inputs: A, B, and Cin. **(2 Marks)**
 - (b) Obtain Boolean expression for both Sum and Carry Outputs **(2 Marks)**
 - (c) Simplify the obtained expressions above separately using laws of Boolean algebra. **(4 Marks)**
 - (d) Draw the full adder circuit based on simplified expressions. **(2 Marks)**
3. You are employed as a trainee software developer in a small retail company. The manager reports that customers frequently ask whether they qualify for a discount based on the amount they spend. The current system is manual and causes delays. The company uses the following discount rules: If the customer spends \$100 or more, they receive a 10% discount, If they spend \$50 or more but less than \$100, they receive a 5% discount and If they spend less than \$50, they receive no discount. You are required to
 - (a) Write pseudo-code that accept purchase amount as input, determine discount based on scenario above and display clear output to the user. **(5 Marks)**
 - (b) Write the C++ program that implements the pseudo-code in part (a). **(5 Marks)**
4. You have been hired as a junior programmer in a small software company. Your supervisor asks you to design a simple Visual Basic calculator that adds two numbers entered by the user. The interface must include two text boxes for user input, one label for displaying results and one command button to perform the addition. The names for each controls are txtNumber1 (for Text1), txtNumber2 (for text2), cmd Add (For command1) and lblResult (to display the sum)
 - (a) Write the Visual Basic code to activate the cmd. Add button so that when clicked, it adds the values from txtNumber1 and txtNumber2 and displays the result in lblResult. **(6 Marks)**

(b) Differentiate between a Text Box and a Combo Box control in Visual Basic. Include at least two differences **(4 Marks)**

5. When the website has been created it has to be published on the internet. You plan to upload it onto the internet using FTP.

(a) (i) Explain what is meant by FTP. **(1 Marks)**

(ii) Explain how to upload and publish the content of a website using FTP. **(3 Marks)**

(b) Before the website is published it needs to be tested.

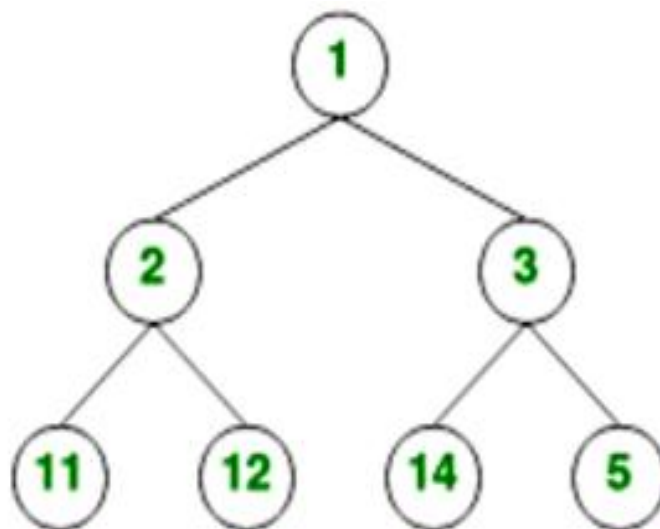
Write down three different features of the web pages that could be tested. For each feature, describe the method you would use to carry out the test. **(6 Marks)**

6. You have been hired as a junior software engineer in a tech startup developing a file-management application. The application stores files in a hierarchical structure using a binary tree, where each node represents a folder, and its left and right children represent sub-folders. Your supervisor asks you to implement a feature that allows users to view the file system in different traversal orders.

(a) What do you understand about binary tree? **(1 Marks)**

(b) Explain three types of binary tree traversals and state the order in which nodes are visited for each. **(4.5 Marks)**

(c) Suppose you are given the following binary tree, study it and answer questions that follows;



Task: Using the binary tree provided, list the nodes in the correct order for each of the discussed types of traversals in part (b) above. **(4.5 Marks)**

7. A local community center recently installed new computers, printers, and other ICT equipment. After several months of use, the administration wants to assess how the introduction of these technologies might affect both the users and the surrounding environment.
- (a) Identify and explain two health problems and three environmental problems that may arise from the use of ICT tools. **(5 Marks)**
 - (b) Suggest practical solutions for each problem you identified in part (a). **(5 Marks)**

SECTION B (30 Marks)

Answer any **two** questions from this section

8. A district hospital is moving from a manual filing system to a computerized information system. At the moment, hospital staff keep patient details in paper folders, while information about medical services is stored in a different cabinet. When a patient comes for medical attention, a staff member searches for the patient's folder and then checks another book to see what type of service the patient is receiving that day. Sometimes patients come back several times for different services, and the staff must rewrite information repeatedly. This often leads to missing records, confusion about which patient received what service, and delays when the hospital administration needs reports. You are requested to design simple relational database management system to solve the issue.
- (a) What do you understand about relational databases? **(3 Marks)**
 - (b) Identify two appropriate entities based on the scenario above and list suitable attributes for each. **(3 Marks)**
 - (c) Draw an E–R diagram showing the relationship between the entities you identified. **(4.5marks)**
 - (d) Convert the E–R diagram into a logical model, clearly showing primary keys and foreign keys. **(4.5 Marks)**
9. Insiders are already within your security perimeter, which makes harmful actions easier to execute and harder to spot. Insider-driven security incidents occur across various industries and organizations of all sizes, demonstrating that no company is immune. Causes range from poor access control to users' carelessness. Even companies like Google, Marks and Spencer, and Coin-base have fallen victim to significant data breaches, exposing millions of records and critical business information. Discuss this issue. **(15 Marks)**
10. The era witnessed a dramatic increase in tools, applications, and platforms based on AI and Machine Learning (ML). These technologies have impacted healthcare, manufacturing, law, finance, retail, real estate, accountancy, digital marketing, Education and several other areas. Give the evidence using vivid examples. **(15 Marks)**