



SCHOOL OF APPLIED SCIENCE AND OPEN LEARNING
ICT DEPARTMENT
BACHELOR OF SCIENCE ICT WITH EDUCATION

ICT 361: INTRODUCTION TO WEB PROGRAMMING
SESSIONAL EXAMINATION 2024
DURATION: 3 HOURS

INSTRUCTIONS:

1. Write your Student Identification Number on the Answer Booklet provided
2. This paper consists of TWO (2) sections:
 - **SECTION A:** Answer **ALL** questions from this section -20 marks
 - **SECTION B:** Answer **FOUR** questions from this section -80 marks

Total = 100 marks

SECTION A: Answer ALL questions from this sectionTotal marks in this section = 20 marks

Question 1

Given the following Javascript array: `var myArray = [1, "two", 3, "4"]`. Write what the alert message will say for each of these examples:

- a. `alert(myArray[0]);`
- b. `alert(myArray[0] + myArray[1]);`
- c. `alert(myArray[2] + myArray[3]);`
- d. `alert(myArray[2] – myArray[0]);` (4 marks)

Question 2

What will each of these Javascript alert messages say?

- a. `var foo = 5; foo + = 5; alert(foo);`
- b. `var foo = 5; alert(foo++);`
- c. `var foo = 2; alert(foo + " " + "remaining");`
- d. `var foo = "Mat"; var bar = "Jennifer"; if(foo.length > bar.length) { alert(foo + " is longer."); } else { alert(bar + " is longer."); }`
- e. `alert(10 === "10");` (5 marks)

Question 3

Write a PHP script that checks if a given number is even or odd. Use `if`, `else`, and `elseif` statements (2 marks)

Question 4

Write a PHP script to perform and display the result of the following arithmetic operations on given variables `$a = 10;` `$b = 5;`

- i. Addition
- ii. Subtraction
- iii. Multiplication
- iv. Division

(4 marks)

Question 5

Write a program to print "Hello PHP" using a php variable? You cannot use text directly in echo but can use variables. (2 marks)

Question 6

Write a program to print 2 php variables using single echo statement.

Conditions:

- First variable with text "Good Morning."
- Second variable with text "Have a nice day!"

Your output should be "Good morning. Have a nice day!" (3 marks)

PLEASE TURN OVER THE PAGE FOR SECTION B

SECTION B: Answer FOUR questions from this sectionTotal marks in this section = 80 marks

Question 1

- a) Briefly explain the difference between the Internet and the World Wide Web (4 marks)
- b) What is the difference between the ``<section>``, ``<article>``, and ``<div>`` tags? (6 marks)
- c) Using an example explain the function `:hover Pseudo-Class`. Why do users of the website consider this function very useful? (6 marks)
- d) Describe the contents and purpose of the CSS Box Model in website development (4 marks)

Question 2

- a) Explain the importance of responsive web design. Provide three key techniques used to achieve responsiveness in web design. (10 marks)
- b) Explain the concept of an Application Programming Interface and give examples of how they are used. (10 marks)

Question 3

- a) One of the best ways to display data is to use a table, where data can be arranged in cells, rows, and columns. Describe FOUR table elements that you would use to format the table and for each of your choices explain their function. (16 marks)
- b) How would you create a table in HTML with the following columns: StudentID, Name, Age? (4 marks)

Question 4

- a) What is cookie technology in website development? Explain why cookies are an important feature of websites. (8 marks)
- b) Is it ethical to implement cookies in websites? Discuss (12 marks)

Question 5

- a) Discuss the significance of web accessibility. What are three best practices to ensure a website is accessible to users with disabilities? (10 marks)

- b) Discuss briefly the concept of Progressive Web Apps (PWAs). What are the advantages of PWAs over traditional web and native mobile apps? (10 marks)



KAPASA MAKASA UNIVERSITY

ICT DEPARTMENT

ICT 320 FINAL EXAM

7TH NOVEMBER, 2024

TIME: 09:00 – 12:00HRS

INSTRUCTIONS

Do not turn this page until you are told to do so

This paper contains 6 Questions in the two SECTIONS.

Attempt **all** questions in **SECTION A** and any other **TWO** from **SECTION B**.

Start each question on a new page.

Time allowed is **3 HOURS** only.

Calculators are allowed in the **EXAM**

SECTION A

[QUESTION_1]

- A. Chelakatwishi Tech Solutions, a multi-national IT organization, has decided to set up a four regional offices in southern Africa. They will have offices in Lusaka, Cape Town, Lilongwe and Windhoek. They each expect to have 470, 800, 240 and 120 hosts respectively. Four WAN Links are used to interconnect the four regional offices. Use VLSM to subnet the internetwork. The IP Address is **172.16.0.0 255.255.0.0**. **Clearly show the Design and the following details.** [20]
- i. Show the subnet for each network
 - ii. The range of valid IP addresses
 - iii. The Block Size and
 - iv. Broadcast address for each subnet
- B. John Sakala has just reported at Kapasa Makasa University as a first year ICT student all the way from Vubwi district, Eastern province. He wants to connect his two switches in order to extend his LAN to the friend's room. You, as a senior student has been asked to provide the color code for the cable that he is supposed to use for him to connect the two switches. [5]
- C. Consider the following destination addresses: How do you tell whether the address is broadcast, unicast or multicast MAC address between a, b and c? [5]
- i. 4B:30:10:21:10:1A,
 - ii. 4C:20:1B:2E:08:EE and
 - iii. FF: FF: FF: FF: FF: FF.
- D. Find the first two and last two valid IP addresses, to which the IP address 192.168.7.52 255.255.255.248 belong. [10]

[QUESTION_2]

- A. The effectiveness of a data communications system depends on four fundamental characteristics: delivery, accuracy, timeliness, and jitter. Briefly explain each of these terms as used in data communication. [8]
- B. For communication to take place, there are two types of connections that can be set up i.e. point-to point or multi-point. Clearly give the difference between the two. [4]
- C. Use suitable diagrams to explain how light is transmitted in the fiber optic cable. Clearly show all the angles and rays involved. [6]
- D. From the frequency band which communication channel and frequency range is used by Chinsali radio Station? [2]

SECTION B

[QUESTION_3]

- A. Explain in details the three impairments that can be experienced in data communication and networking. [3]
- B. A non-periodic composite signal has a bandwidth of 260 kHz, with a middle frequency of 115 kHz and peak amplitude of 15 V. The two extreme frequencies have an amplitude of 0. Draw the frequency domain of the signal. [7]
- C. A digital signal has sixteen levels. How many bits are needed per level? [2]
- D. The power of a signal is 10 mW and the power of the noise is 1microW; what are the values of SNR and SNRdB? [8]

[QUESTION_4]

- A. What is modulation of a signal and why is modulation needed? [2]
- B. You have received a digital signal 110100101 and are required to use digital to analog conversion in order to carry out the implementation for OOK, FSK and PSK. Show the implementation clearly depicting the received signal, carrier signals and the modulated signals. [8]
- C. A constellation diagram helps us to define the amplitude and phase of a signal when we are using two carriers, one in quadrature of the other. Use the constellation diagram to modulate two signals combines as 101100001000010011110111 if the bit rate is 24 and baud rate is 8 [10]

[QUESTION_5]

- A. A signal is carrying data in which one data element is encoded as one signal element. If the bit rate is 100 kilobits per second, what is the average value of the baud rate if c is between 0 and 1? [3]
- B. Consider the multilevel 2B1Q scheme transition table below. You are required to encode the data pattern 0011011001 assuming positive original level [7]

	Previous level: positive	Previous level: negative
Next bits	Next level	Next level
00	+1	-1
01	+3	-3
10	-1	+1
11	-3	+3

Transition table

- C. We want to digitize the human voice. What is the bit rate, assuming 8 bits per sample? [5]

- D. Four channels, each with 120-kHz bandwidth, are to be multiplexed together. What is the minimum bandwidth of the link if there is a need for a guard band of 8 kHz between the channels to prevent interference? [5]

[QUESTION_6]

- A. We can divide today's networks into three broad categories: **circuit-switched networks**, **packet-switched networks**, and **message-switched**. Briefly explain each of the above switching techniques. [6]
- B. Differentiate between in-band and out of band signaling [4]
- C. Find the minimum Hamming distance of the coding scheme in the following: [5]
- i. $d(00000, 01011)$
 - ii. $d(01011, 10101)$
 - iii. $d(00000, 10101)$
 - iv. $d(01011, 11110)$
 - v. $d(00000, 11110)$
 - vi. $d(10101, 11110)$
- D. List and explain at least two protocols found at each of the layers of the OSI model. [5]

The end

The future is in your hands



SCHOOL OF APPLIED SCIENCE AND OPEN LEARNING
BACHELOR OF ICT WITH EDUCATION
ICT 350: Object Oriented Programming (Java)

SESSIONAL EXAMINATION

DATE: **TIME: 3 hours**

INSTRUCTIONS

1. Write your Student Identification Number on the Answer Booklet provided
 2. This paper has only 2 sections, Section A and Section B. [60 marks]
 3. Section A contains open ended questions
 4. Section B answer any 3 questions
 5. Please write as clearly as possible as illegible handwriting cannot be marked.
 6. Number the answers to the questions clearly before answering
-

Section A (Answer all Questions) [4 marks each question]

1. Write a java program that asks a user to enter a grade then it determines whether it's a pass or fail.

Test Data:

Pass is 40 and above

Fail is less than 40

Enter your grade: 40 or 20

Expected Output: You have passed / You have failed

2. Write a Java program to print 'Hello' on screen and then print your name on a separate line.

Expected Output:

Hello

Mwansa Peter

3. Write a Java program to print the sum of two numbers.

Test Data:

74 + 36

Expected Output: 110

4. What is inheritance in Java? How does it differ from polymorphism?
5. Define the following terms and give one example for each in Java:
 - Encapsulation
 - Polymorphism

SECTION B (Answer any 3 Questions) [40 marks]

QUESTION 1

A hotel's occupancy rate in Lusaka is calculated as follows: Occupancy rate:

$$\text{Occupancy rate} = \text{Number of rooms occupied} / \text{Total number of rooms}$$

Write a program that calculates the occupancy rate for each floor of a hotel. The program should start by asking for the number of floors in the hotel. A loop should then iterate once for each floor. During each iteration, the loop should ask the user for the number of rooms on the floor and the number of them that are occupied. After all the iterations, the program should display the number of rooms the hotel has, the number of them that are occupied, the number that are vacant, and the occupancy rate for the hotel. [13.3 marks]

QUESTION 2

You are required to develop a simple graphical user interface (GUI) application using Java Swing. The application should:

- Display a window with two text fields for user input
- Allow the user to input numbers and click a button to calculate their sum
- Display the result in a label below the input fields

Provide the complete Java code and explain how event handling is used in your program.

[13.3 marks]

QUESTION 3

Write a Java program that demonstrates the following concepts:

- Inheritance
- Method Overriding
- Encapsulation

Your program should contain a superclass Vehicle, a subclass Car, and demonstrate encapsulation with private attributes and public accessor methods.

[13.3 marks]

QUESTION 4

Write a simple program that demonstrates polymorphism using Java's inheritance. You have three classes: Animal, Dog, and Cat. The Animal class has a method called makeSound(), which is overridden by both Dog and Cat to provide their specific implementations. Write a program that includes the following:

1. A base class Animal with a makeSound() method that prints "Some generic animal sound".
2. A derived class Dog that overrides the makeSound() method to print "Bark".
3. A derived class Cat that overrides the makeSound() method to print "Meow".
4. A method that accepts an Animal object and calls its makeSound() method.
5. Demonstrate polymorphism by creating an array of Animal objects (containing both Dog and Cat instances) and invoking their makeSound() methods using a loop.

Expected Output: The program should print the respective sounds based on the actual object type at runtime. **[13.3 marks]**

QUESTION 5

Explain how event handling works in Java. Write a program that creates a simple GUI using Java Swing where:

- There is a button labeled "Click Me".
- When the button is clicked, it changes the text of a label to "Button Clicked".

[13.3 marks]



KAPASA MAKASA UNIVERSITY
Department of Education and Open Learning
BSc. in Information and Communication Technology
Course: ICT Teaching Methods
Course Code: TM310
SESSIONAL EXAMINATIONS
Venue: Upper Library
Date: October 21, 2024; Duration: 3 Hours

Instructions:

- This Sessional Examination consists of 7 questions
- Answer any 5 questions.

Question 1: (20 marks each)

GRADE 9 SYLLABUS

TOPIC	SUB TOPIC	SPECIFIC OUTCOME	KNOWLEDGE	SKILLS	VALUE
9.1 Introduction to Computers	9.1.1 Terminology 9.1.2 Peripheral devices 9.1.3 Input-process-output operations	9.1.1.1 Define the terminologies of a computer system 9.1.2.1 Connecting peripheral devices to their appropriate computer ports 9.1.2.1 Recognise that the speed of a CPU is measured in Megahertz (MHz) or Gigahertz (GHz) 9.1.3.1 Identify meaningful information as a result of processed input data by the computer 9.1.3.2 Appreciate that certain devices are both input as well as output (e.g. touch screens)	<ul style="list-style-type: none"> Computer terminology: peripheral device PDAs, GB, MHz, GHz, BIT, BYTES, Megabytes etc. Defining basic computer terminology Peripheral devices Units of the processing speed and their relationship Units of storage – BIT, Byte, Megabyte, Gigabyte and their conversions. Input, process and output devices 	<ul style="list-style-type: none"> Connecting peripheral devices to their appropriate computer ports Converting of bytes into Bits and converting Bits into Bytes, Kilobytes & Megabytes Interpreting the various files sizes Relating file size to storage space 	<ul style="list-style-type: none"> Appreciating the various types of ports (serial, parallel & USB) Relation between processing speed and file size Appreciation of limitations of storage media regarding size

From the above extract prepare a

- two weeks scheme of work
- 40 minute lesson plan
- two weeks record of work
- discuss why you think the three instrument above are important.

Question 2: (20 marks)

- In his 1969 version of Audiovisual Methods in Teaching, Edgar Dale introduced 'rich experiences'. According to Dale, effective learning environments should offer memorable and rich experiences where learners can use multiple senses. He illustrated his proposition using a cone of experiences. Show your understanding of Edgar Dale's cone of experience in line with active and passive learning in classroom.
- Alvin Toffler (2005) proffered that "The illiterate of the future are not those who can't read or write but those who cannot learn, unlearn, and relearn." As a teacher living in the 21st century can you debate for or against this proposition?

Question 3: (20 marks)

- (a) Learning is usually said to be either teacher centred or learner centred. Define teacher-centered learning then state and describe any 9 factors that are seen in a teacher-centered learning environment.
- (b) What is Student-Centered Learning?. State and describe any 9 practices that are prevalent in student-centered learning environment.

Question 4: (20 marks)

Explain the "Three Domains of Learning" and provide one educational activity example for each domain. In your answer:

- (a) Define each of the three domains: *Cognitive*, *Affective*, and *Psychomotor*.
- (b) Provide an example of an activity or task that can be used to develop skills in each domain.
- (c) Discuss the significance of understanding these domains for effective teaching and learning.
- (d) Kapasa Makasa Debate club stated the motion that, "The Spiral curriculum is predicted on the cognitive theory advanced by Jerome Bruner (1960), who wrote, "We begin with the hypothesis that any subject can be taught in some intellectually honest form to any child at any stage of development (p. 33)". As a member of KMU debate club, you are chosen to discuss in favor of this motion. Use a class room practical example as you debate in support of the above motion.

Question 5: (20 marks)

- (a) Describe the proposition of problem solving made by Borasi (1986). Give a detailed explanation to show your understanding of the four structural elements Borasi proposed.
- (b) How can you develop learners literacy skills using ICT to locate relevant information, analyses, interpret it evaluate its usefulness, and and communicate results?
- (c) The use of strategies for teaching ICT skills, concepts and processes cannot be overemphasised. Discuss 5 of such strategies where possible give practical classroom examples to underscore your points.

Question 6: (20 marks)

Discuss the concept of "Learning How to Learn" and its importance in lifelong education of pupils. In your answer:

- (a) Define "Learning How to Learn" and explain its key components.
- (b) Identify at least two strategies or techniques that help individuals improve their learning skills.
- (c) Discuss the role of "Learning How to Learn" in fostering independent learning and adaptability in a rapidly changing world.
- (d) Briefly discuss why you think the syllabus is important and state any differences you may have noticed between a curriculum and a syllabus.

Question 7: (20 marks)

- (a) Deductive and inductive methods are key in the learning and teaching of ICT. Using a class room practical example, demonstrate how you can achieve sequencing of instructions using either of the two methods.
- (b) As a teacher you are required to use teaching aids as you deliver the lessons. Imagine you are posted to a very remote small school that receives a very small grant and can not afford to purchase commercially produced teaching aids. Show how you can improvise and preserve the your locally produced teaching aids.
- (c) It is a duty of a teacher to prepare a good test at the end of every term. The features of a good test are (validity, reliability, fairness, discrimination, comprehensiveness, easy of administration and scoring). Justify how you can succeed in preparing the good test having these features.



KAPASA MAKASA UNIVERSITY

SCHOOL OF APPLIED SCIENCE AND OPEN LEARNING

BACHELOR OF SCIENCE – (ICT with Education)

COURSE CODE: PE 330 (Principles of Education)

END OF THIRD YEAR SESSIONAL EXAMINATIONS

Date: 4th November, 2024.

Duration: 3 hours

Marks: 100

Instructions:

1. Write your Student Identification Number on the Answer Booklet provided
2. There are two sections in this paper; Sections A and B
3. Section A has eight (8) items, choose only five (5) and write brief notes about them.
4. Section B has four (4) questions, choose only two (2) questions.
5. Always clarify key concepts in a question.
6. Use examples relevant to your field of specialisation or study where possible.
7. There are three (3) typed pages in this examination paper.

Lecturer: Philip Siwale

SECTION A (40 Marks)

1. There are **eight (8)** items under this question, choose only **five (5)** and write brief notes about each one of them. Each question carries **8 marks**.
- (a) Systematic sampling
 - (b) Problem statement
 - (c) Research questions
 - (d) Significance of the study
 - (e) Positivist paradigm
 - (f) Research ethics
 - (g) Parenthetical citations
 - (h) Case study

SECTION B (60 Marks)

Section B has four (4) questions. Choose only two (2). *Each question carries 30 marks.*

2. (a) What is research? *(5 marks.)*
(b) Describe the characteristics of research. *(10 marks.)*
(c) What is the meaning of educational research and why do research in education? *(15 marks.)*
3. A questionnaire is a vital research instrument for survey designs:
(a) What is a questionnaire? *(5 marks)*
(b) Outline the qualities of a good questionnaire. *(25 marks)*
4. Consider a research title; *“Challenges faced by ICT teachers and pupils in the integration of ICT in rural areas.”*
(a) Identify the independent and dependent variables. *(4 Marks)*
(b) What is an experiment all about? *(3 Marks)*
(c) Consider a research design below:

R O X O Group A

R O - O Group B

- i. Identify this research design. *(3 Marks)*
 - ii. What is **Group A** called? *(2 Marks)*
 - iii. Why are the pre-test and the post- test important in this case?*(18 Marks)*
5. (a) What is literature review? *(5 Marks)*
- (b) Identify four areas of focus when reviewing literature. *(5 Marks)*
- (c) Why is reviewing literature important? *(20 Marks)*

End of Paper.