

UNIVERSITY OF ESWATINI
FACULTY OF EDUCATION
DEPARTMENT OF CURRICULUM AND TEACHING
MAIN EXAMINATION QUESTION PAPER (MAY, 2021)

TITLE OF PAPER: CURRICULUM STUDIES IN COMPUTER SCIENCE I
COURSE CODE: CTE 337/CTE 537
PROGRAMME: B. Ed./B.Sc.COMP.SCI.ED./PGCE (FULL TIME AND
IDE)
DURATION: THREE (3) HOURS

INSTRUCTIONS:

1. This paper contains five (5) questions. Answer any four (4) questions.
2. Each question has a total of 25 marks.

**THIS PAPER SHOULD NOT BE OPENED UNTIL PERMISSION HAS BEEN
GRANTED BY THE INVIGILATOR**

QUESTION 1

Integration of computer technology in teaching and learning was wrought by perceived apprehension emanating from conflicting curriculum underpinnings. In view of this, attempt a chronological exposition of the advent of computers in education, detailing innovations that propelled its rapid inclusion in educational practice. [25 marks]

QUESTION 2

- a) Optimal design and use of a computer laboratory exacts physical architecture, layout, capacity, total surface area and utility of space in order to obtain a conducive teaching and learning environment. By use of suitably labelled illustrations, demonstrate the difference between an optimal and sub-optimal computer laboratory layout. Justify your answer. [10 marks]
- b) Select any topic from the Eswatini approved secondary school Computer Science syllabus and explain apt routines and procedures to optimize computer laboratory management and enhance comprehension based on the following: [15 marks]
- i) Pre laboratory activities
 - ii) Actual laboratory activities
 - iii) Post laboratory activities

QUESTION 3

The sub-topics “Input devices, Output devices, Memory, storage and media” have been derived from the Cambridge IGCSE syllabus (excerpt appended). Based on the excerpt:

- a) Design a scheme of work to teach any of the sub-topics for one (1) week. [15 marks]
- b) From the scheme of work designed, derive a lesson plan to teach any of the sub-topics. [10 marks]

QUESTION 4

Explain the relevance of the following methods of teaching as applied in Computer Science education in high schools:

- i) The Project Method [15 marks]
- ii) Think-pair-share method [10 marks]

QUESTION 5

- a) Discuss the significance of *reliability* and *differentiality* as properties of a good testing instrument in educational computing. [10 marks]
- b) Examine the mandatory teaching guidelines that enhance effective execution of a Computer Science syllabus. [15marks]

1.3.3 Input devices

Candidates should be able to:

- describe the principles of operation (how each device works) of these input devices: 2D and 3D scanners, barcode readers, Quick Response (QR) code readers, digital cameras, keyboards, mice, touch screens, interactive whiteboards, microphones
- describe how these principles are applied to real-life scenarios, for example: scanning of passports at airports, barcode readers at supermarket checkouts, and touch screens on mobile devices
- describe how a range of sensors can be used to input data into a computer system, including light, temperature, magnetic field, gas, pressure, moisture, humidity, pH and motion
- describe how these sensors are used in real-life scenarios, for example: street lights, security devices, pollution control, games, and household and industrial applications

1.3.4 Output devices

Candidates should be able to:

- describe the principles of operation of the following output devices: inkjet, laser and 3D printers; 2D and 3D cutters; speakers and headphones; actuators; flat-panel display screens, such as Liquid Crystal Display (LCD) and Light-Emitting Diodes (LED) display; LCD projectors and Digital Light Projectors (DLP)
- describe how these principles are applied to real-life scenarios, for example: printing single items on demand or in large volumes; use of small screens on mobile devices

1.3.5 Memory, storage devices and media

Candidates should be able to:

- show understanding of the difference between: primary, secondary and off-line storage and provide examples of each, such as:
primary: Read Only Memory (ROM) and Random Access Memory (RAM)
secondary: hard disk drive (HDD) and Solid State Drive (SSD); off-line: Digital Versatile Disc (DVD), Compact Disc (CD), Blu-ray disc, USB flash memory and removable HDD
- describe the principles of operation of a range of types of storage device and media including magnetic, optical and solid state
- describe how these principles are applied to currently available storage solutions, such as SSDs, HDDs, USB flash memory, DVDs, CDs and Blu-ray discs
- calculate the storage requirement of a file

1.3.6 Operating systems

Candidates should be able to:

- describe the purpose of an operating system (Candidates will be required to understand the purpose and function of an operating system and why it is needed. They will not be required to understand how operating systems work.)
- show understanding of the need for interrupts