THE UNITED REPUBLIC OF TANZANIA

NATIONAL EXAMINATIONS COUNCIL OF TANZANIA

DIPLOMA IN SECONDARY EDUCATION EXAMINATION

738 INFORMATION AND COMMUNICATION TECHNOLOGY

Time: 3 Hours **ANSWERS** **Year: 2013**

Instructions

1. This paper consists of section A, B and C.

2. Answer all questions in section A, two questions from section B and two questions from section C.

SECTION A (40 Marks)

Answer all questions in this section.

1. Elaborate briefly the following concepts as used in database management systems:

(a) Input Design: Input design structures data entry, like forms, ensuring science accuracy, enhancing teaching efficiency and educational outcomes through organized systems and learning tools.

(b) Output Design: Output design formats results, like reports, presenting science information, improving teaching precision and stability through clear communication and educational strategies.

(c) File and Data: Files store data, like records, managing science information, supporting teaching quality and learning progress through reliable storage and educational resources.

2. Briefly describe any four functions of an operating system in relation to hardware

Process Management: One function is process management, scheduling tasks. It runs science programs, enhancing teaching efficiency and educational outcomes through optimized computing and learning.

Memory Management: Memory management allocates resources, storing data. It handles science files, improving teaching precision and stability through efficient systems and education tools.

Device Management: Device management controls hardware, like printers. It manages science peripherals, boosting teaching quality and stability through reliable operations and learning strategies.

Security: Security protects systems, preventing breaches. It safeguards science data, enhancing teaching reliability and educational progress through safe environments and instructional tools.

3. Match the storage devices in Column A with corresponding descriptions in Column B

Column A

Column B

(i) CD-ROM

(a) Information can be added once but not changed or erased thereafter

(ii) Digital Audio Tape

(b) Data on the disk can be erased and replaced with other data

(iii) CD-R

(c) Can only read the information stored but cannot add more information or change already existing information

(iv) DVD

(d) Allows sequential access of information i.e. first saved is first accessed

(v) CD-RW

(e) Flexible disks made from plastic materials enclosed inside a protective jacket

(vi) Hard Disks

(f) Information is stored in two layers of each surface; hence more capacity to store data than a normal CD

(vii) Magnetic Stripped Cards

(g) Contains many tracks in form of concentric circles, one inside the other

(viii) Floppy Disks

(h) Storage devices made up of plastic materials coated with a strip of magnetic oxide are normally used in portable computers

Matches:

CD-ROM: (c) Can only read the information stored but cannot add more information or change already existing information

Digital Audio Tape: (d) Allows sequential access of information i.e. first saved is first accessed

CD-R: (a) Information can be added once but not changed or erased thereafter

DVD: (f) Information is stored in two layers of each surface; hence more capacity to store data than a normal CD

CD-RW: (b) Data on the disk can be erased and replaced with other data

Hard Disks: (g) Contains many tracks in form of concentric circles, one inside the other

Magnetic Stripped Cards: (h) Storage devices made up of plastic materials coated with a strip of magnetic oxide are normally used in portable computers

Floppy Disks: (e) Flexible disks made from plastic materials enclosed inside a protective jacket

These matches enhance teaching precision and educational outcomes by clarifying science storage options, supporting learning and development through accurate resource understanding and instructional tools.

4. Elaborate the application of the following attributes of spreadsheet programs:

(a) Number Tab: Number tab formats data, like currency, managing science figures, enhancing teaching efficiency and educational outcomes through precise calculations and learning tools.

(b) Border and Pattern Tab: Border and pattern tab styles cells, like grids, presenting science data, improving teaching quality and stability through clear visuals and educational strategies.

(c) Alignment Tab: Alignment tab positions text, like centering, organizing science information, boosting teaching precision and learning progress through readable formats and instruction.

5. (a) Define the term “Table of Specification”

Table of Specification refers to a planning tool, outlining science content and objectives, ensuring balanced assessment, enhancing teaching effectiveness and educational outcomes through structured evaluation and learning.

5. (b) Outline the stages necessary in constructing a Table of Specification

Identify Objectives: One stage is identifying objectives, defining goals. Listing science aims ensures focused assessment, enhancing teaching precision and educational outcomes through clear planning and learning.

List Content Areas: Listing content areas, like topics, follows. Outlining science subjects supports comprehensive evaluation, improving teaching quality and stability through structured education and learning tools.

Determine Weighting: Determining weighting assigns importance, like percentages. Allocating science priorities ensures fair assessment, boosting teaching effectiveness and educational progress through balanced strategies and learning.

Construct Table: Building the table organizes data, linking objectives to content. Mapping science areas enhances teaching reliability and stability through systematic assessment and educational outcomes.

6. Giving examples elaborate how selection and iteration (looping) control structures are used during computer programming

Selection (If-Else): Selection, like If-Else, chooses paths, e.g., “If age > 18, output ‘Adult’ else ‘Minor’.” It manages science decisions, enhancing teaching efficiency and educational outcomes through logical programming and learning.

Iteration (For Loop): Iteration, like For loops, repeats tasks, e.g., “For i = 1 to 10, print i.” It handles science repetitions, improving teaching precision and stability through efficient coding and educational strategies.

7. Explain four factors to consider in setting up a computer laboratory

Space Requirements: One factor is space, ensuring room size. Adequate areas for science equipment support functionality, enhancing teaching stability and educational outcomes through proper facilities and learning.

Infrastructure: Reliable power and internet are crucial, supporting use. Science labs need connectivity, boosting teaching quality and learning progress through functional technology and education.

Budget: Financial resources determine feasibility, ensuring affordability. Funding for science hardware supports educational progress, enhancing stability and teaching effectiveness through cost management and learning.

Safety Measures: Safety protocols, like fire exits, protect users. Science labs require secure environments, improving teaching precision and student well-being through risk management and education.

8. (a) Is this a pseudocode?

Yes, the provided pseudocode program is valid:

```
START

INPUT Income

IF Income < 15000 THEN

   OUTPUT "Lower class"

ELSE IF Income >= 15000 AND Income < 50000 THEN

   OUTPUT "Middle class"

ELSE

   OUTPUT "Upper class"

END IF

STOP
```

It processes science income data, enhancing teaching efficiency and educational outcomes through structured logic and learning tools for programming instruction and assessment.

8. (b) Write a pseudocode program that can be used to classify people according to income. If the person's income is less or equal to 15,000,000 per year, output "Lower class"; otherwise the program should display "Upper class"

```
START

INPUT Income

IF Income <= 15000000 THEN

   OUTPUT "Lower class"

ELSE

   OUTPUT "Upper class"
```

END IF

STOP

This pseudocode classifies science income levels, enhancing teaching precision and educational outcomes through logical programming and learning strategies for assessment and instruction.

9. Briefly explain the functions of each component of a Central Processing Unit (CPU)

Arithmetic Logic Unit (ALU): ALU performs calculations, like additions, processing science data, enhancing teaching efficiency and educational outcomes through computational accuracy and learning tools.

Control Unit (CU): CU directs operations, managing tasks, coordinating science processes, improving teaching precision and stability through orderly execution and educational strategies.

Registers: Registers store data temporarily, like values, holding science information, boosting teaching quality and learning progress through fast access and instructional efficiency.

SECTION B (30 Marks)

Answer two (2) questions from this section.

11. Trace the development of computer programming language generations in the order of their evolution

First Generation (Machine Language): One stage is machine language, using binary, slow and complex, supporting early science calculations, laying foundations for educational technology and development through basic computing and learning.

Second Generation (Assembly Language): Assembly language used mnemonics, improving readability, enhancing science programming efficiency, improving teaching effectiveness and stability through structured education and learning tools.

Third Generation (High-Level Languages): High-level languages, like FORTRAN, are user-friendly, boosting science productivity, enhancing educational outcomes and teaching quality through accessible programming and learning strategies.

Fourth Generation (4GL): 4GLs are task-specific, simplifying tasks, advancing science automation, supporting teaching precision and stability through efficient development and educational progress.

Fifth Generation (Natural Language): Fifth-generation uses natural language, like AI, enhancing science interaction, improving teaching impact and educational outcomes through intuitive programming and learning tools.

12. Examine five limitations of the print media as one of the instructional media in preparing learning materials

Limited Interactivity: One limitation is limited interactivity, restricting engagement. Print lacks science feedback, challenging teaching effectiveness and educational outcomes through passive learning and instruction.

Outdated Content: Print may offer outdated content, lacking updates. Science information becomes irrelevant, necessitating alternatives for teaching precision and learning progress through current resources and learning.

Accessibility Issues: Poor distribution limits access, causing gaps. Science materials miss remote areas, reducing teaching quality and stability through unequal availability and educational outcomes.

Cost Constraints: High costs hinder production, straining budgets. Science printing expenses limit resources, challenging teaching reliability and stability through financial barriers and learning tools.

Environmental Impact: Print contributes to waste, harming ecosystems. Paper use affects science environments, requiring sustainability for teaching precision and educational progress through eco-friendly strategies and learning.

13. Evaluate five benefits of installing a computer network in an organization

Resource Sharing: One benefit is resource sharing, accessing files. Networks enable science data exchange, enhancing teaching efficiency and educational outcomes through collaborative tools and learning in organizations.

Communication: Networks improve communication, like emails. They connect science teams, boosting teaching effectiveness and stability through efficient interaction and educational progress in workplaces.

Cost Efficiency: They reduce costs, centralizing resources. Shared science hardware lowers expenses, supporting teaching stability and development through economical strategies and learning tools in organizations.

Data Management: Networks enhance data management, storing records. Science databases improve organization, supporting teaching quality and learning outcomes through reliable systems and education in workplaces.

Collaboration: They foster collaboration, enabling projects. Science groups work together, enhancing teaching impact and stability through interactive learning and educational strategies in organizations.

14. Analyze at least five features of word processing software giving examples of how useful they are to the user

Spell Check: One feature is spell check, correcting errors. It fixes science typos in reports, enhancing teaching precision and educational outcomes through accurate documents and learning tools.

Formatting: Formatting styles text, like fonts, organizing content. It arranges science data in presentations, improving teaching quality and stability through clear communication and education.

Insert Objects: Inserting objects, like images, enriches documents. Science graphics illustrate concepts, boosting teaching effectiveness and learning progress through visual aids and instructional strategies.

Templates: Templates provide structures, like forms, streamlining tasks. They create science outlines, enhancing teaching efficiency and educational outcomes through organized resources and learning.

Track Changes: Track changes monitors edits, ensuring collaboration. It revises science drafts, supporting teaching reliability and stability through transparent updates and educational progress in teams.

SECTION C (40 Marks)

Answer two (2) questions from this section.

15. Describe in detail the advantages and disadvantages of using two tools that a teacher needs in planning for teaching and learning at the beginning of a new academic year

Calendars:

Advantages: One advantage is organization, scheduling lessons. Calendars plan science topics, enhancing teaching efficiency and educational outcomes through structured planning and learning. They ensure time management, allocating periods for science activities, improving teaching quality and stability through effective scheduling and education.

Disadvantages: One disadvantage is rigidity, limiting flexibility. Calendars may not adapt to science changes, challenging teaching precision and stability through fixed schedules and learning constraints. They require updates, risking errors, necessitating adjustments for teaching effectiveness and educational progress through accurate planning and instruction.

Lesson Plans:

Advantages: One advantage is structure, outlining objectives. Lesson plans detail science goals, enhancing teaching precision and educational outcomes through organized instruction and learning. They support resource allocation, listing needs, improving teaching quality and stability through available materials and educational strategies.

Disadvantages: One disadvantage is time consumption, slowing preparation. Lesson plans for science topics extend planning, challenging teaching efficiency and stability through resource demands and learning constraints. They may lack flexibility, risking irrelevance, necessitating adaptations for teaching effectiveness and educational progress through dynamic strategies and instruction.

16. Choose any five assessment strategies and describe how they can be used in the assessment process

Tests: One strategy is tests, measuring knowledge. Science quizzes on programming evaluate progress, enhancing teaching effectiveness and educational outcomes through structured assessment and learning in classrooms, by scoring responses to gauge understanding and provide feedback.

Projects: Projects assess application, like software design. Science assignments on databases demonstrate skills, improving teaching quality and student learning through practical evaluation and progress in education, by reviewing completed work for creativity and technical accuracy.

Quizzes: Quizzes provide quick feedback, gauging understanding. Science checks on networking concepts support teaching precision, enhancing educational stability and student achievement through frequent assessment and learning, by analyzing short answers for immediate insight.

Observations: Observations evaluate behavior, like participation. Science teachers monitor ICS labs, improving teaching impact and learning outcomes through direct assessment and engagement strategies in classrooms, by noting student interactions for qualitative feedback.

Portfolios: Portfolios compile work, showing growth. Science collections of coding projects track progress, enhancing teaching effectiveness and educational development through comprehensive evaluation and learning, by reviewing accumulated work for long-term achievement and improvement.

17. Elaborate five psychological benefits of using audio-visual materials in teaching ICS

Engagement: One benefit is engagement, making lessons interactive. Audio-visuals, like videos, captivate students, enhancing teaching impact and educational outcomes through science-based learning and stability in classrooms.

Motivation: They increase motivation, encouraging effort. Science clips inspire interest, improving teaching effectiveness and stability through stimulating education and learning progress for students.

Memory Retention: Audio-visuals improve retention, reinforcing memory. Science animations aid recall, supporting teaching quality and educational outcomes through memorable experiences and learning tools in ICS.

Reduced Anxiety: They reduce anxiety, easing learning. Science visuals clarify complex concepts, enhancing teaching precision and stability through comfortable education and progress for students in classrooms.

Enhanced Comprehension: Audio-visuals enhance comprehension, simplifying ideas. Science diagrams clarify processes, boosting teaching impact and educational outcomes through clear learning and instructional strategies in ICS.

18. Explain three benefits of subjective type of items and two benefits of objective type of items in assessment of ICS

Subjective Type Benefits:

Critical Thinking: One benefit is critical thinking, assessing depth. Science essays on programming evaluate analysis, enhancing teaching effectiveness and educational outcomes through detailed responses and learning.

Creativity: Subjective items foster creativity, encouraging originality. Science projects on databases promote innovation, improving teaching quality and stability through unique solutions and educational progress.

Flexibility: They offer flexibility, adapting to needs. Science questions on networking allow varied answers, boosting teaching precision and stability through personalized assessment and learning.

Objective Type Benefits:

Efficiency: One benefit is efficiency, quick grading. Science quizzes on systems save time, enhancing teaching productivity and educational outcomes through rapid evaluation and learning.

Objectivity: Objective items ensure objectivity, reducing bias. Science tests on software are scored uniformly, improving teaching fairness and stability through reliable assessment and education.