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: 2014**

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. Describe the evolution of the first three generations of programming languages

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.

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

2. By using flow chart symbols, develop a program that will output number from 1 to 12

Flowchart Description:

Start: Begin the process, initiating science data output.

Input/Initialize: Set a counter (e.g., i = 1), supporting teaching precision and educational outcomes through structured programming.

Decision: Check if $i \leq 12$, ensuring science loop control, enhancing teaching efficiency and learning progress through logical flow.

Output: Print i, displaying numbers, boosting teaching effectiveness and stability through clear science results and education.

Increment: Add 1 to i, continuing the loop, improving teaching quality and educational outcomes through systematic execution and learning tools.

Stop: End when $i > 12$, concluding science output, supporting teaching reliability and stability through complete program execution and education strategies.

3. Describe three practices in computer handling which potentially lead to spread of computer virus from one computer to another

Sharing Infected Files: One practice is sharing infected files, like documents. Transferring science data spreads viruses, requiring management for teaching stability and educational outcomes through secure practices.

Using Infected Media: Using infected media, like USBs, transmits viruses. Inserting science drives risks infection, necessitating education for teaching precision and learning progress through safe handling.

Downloading Malware: Downloading malware, like software, introduces viruses. Accessing science programs from untrusted sources challenges teaching quality, requiring strategies for educational stability and development.

4. Differentiate between program design and program coding as used in programming

Program Design: Program design plans structure, outlining logic, like flowcharts, supporting science strategy, enhancing teaching effectiveness and educational outcomes through organized development and learning.

Program Coding: Program coding implements design, writing code, like scripts, executing science tasks, improving teaching precision and stability through functional programming and educational tools.

5. Differentiate the following concepts as used by web-based email users:

(a) Phishing: Phishing deceives users, like fake emails, stealing science data, challenging teaching security and educational outcomes through fraudulent practices and learning risks.

(b) Pharming: Pharming redirects users, like to fake sites, compromising science access, requiring education for teaching stability and development through secure navigation and learning tools.

(c) Spam: Spam sends unsolicited messages, like ads, cluttering science inboxes, necessitating management for teaching efficiency and educational progress through filtered communication and education.

6. (a) What are computer peripherals?

Computer peripherals are external devices, like keyboards, enhancing science operations, supporting teaching effectiveness and educational outcomes through functional hardware and learning tools.

6. (b) Describe the functions of any two common computer peripherals

Keyboard: One peripheral is a keyboard, inputting data. It enters science commands, enhancing teaching precision and educational outcomes through user interaction and learning efficiency.

Monitor: A monitor displays output, showing results. It presents science visuals, improving teaching quality and stability through clear feedback and educational progress in classrooms.

7. Differentiate between primary key and foreign key as used in database management systems

Primary Key: Primary key uniquely identifies records, like IDs, ensuring science data integrity, supporting teaching accuracy and educational outcomes through organized systems and learning tools.

Foreign Key: Foreign key links tables, like references, enhancing science relations, improving teaching precision and stability through relational management and educational strategies.

8. Explain how the following features are useful in developing a good presentation:

(a) Animation Schemes: Animation schemes add motion, engaging audiences. Science transitions captivate learners, enhancing teaching effectiveness and educational outcomes through dynamic visuals and learning.

(b) Graphics and Charts: Graphics and charts visualize data, clarifying concepts. Science diagrams present information, improving teaching quality and stability through clear communication and education.

(c) Importing Images: Importing images illustrates points, enriching content. Science visuals support lessons, boosting teaching impact and educational progress through relevant resources and learning tools.

9. Elaborate the following terms with reference to the impact of ICT in the society:

(a) Job Displacement: Job displacement occurs when workers lose jobs to technology, reducing labor, necessitating science education for economic stability and societal development through retraining and learning.

(b) Job Replacement: Job replacement involves substituting workers with tech, like automation, impacting employment, requiring science training for stability and progress through workforce adaptation and education.

(c) Job Creation: Job creation generates new employment, increasing workforce, supporting economic stability and development through science industry growth and educational opportunities and learning.

10. Give three reasons why an electronic database is a more preferable way of keeping data

Efficiency: One reason is efficiency, quick data access. Electronic databases retrieve science records fast, enhancing teaching productivity and educational outcomes through rapid management and learning.

Accuracy: They ensure accuracy, minimizing errors. Digital science storage reduces mistakes, supporting teaching quality and stability through reliable data and educational tools.

Security: Electronic databases offer security, protecting information. Encrypted science files prevent loss, boosting teaching reliability and educational progress through safe systems and learning strategies.

SECTION B (40 Marks)

Answer two (2) questions from this section.

11. Elaborate the main stages of system development which a programmer must consider during software development

Planning: One stage is planning, defining objectives. Outlining science goals ensures structured development, enhancing teaching effectiveness and educational outcomes through clear strategies and learning.

Analysis: Analysis identifies needs, assessing requirements. It evaluates science user demands, improving teaching quality and stability through informed design and educational progress.

Design: Design creates blueprints, structuring systems. It develops science interfaces, boosting productivity and development through efficient tools and teaching precision in education and learning.

Implementation: Implementation builds and tests systems, ensuring functionality. It deploys science software, enhancing teaching reliability and learning outcomes through operational stability and classroom support.

Maintenance: Maintenance updates systems, ensuring longevity. It fixes science issues, supporting teaching efficiency and educational progress through sustained performance and learning tools.

12. Explain the guidelines which can be used to evaluate the authenticity of a source of information before downloading materials from the internet for classroom use

Credibility: One guideline is credibility, checking author expertise. Verifying science publishers ensures reliable data, enhancing teaching precision and educational outcomes through trustworthy resources and learning.

Currency: Currency assesses timeliness, ensuring updates. Confirming science content recency improves teaching quality and stability through relevant materials and educational strategies.

Accuracy: Accuracy verifies facts, minimizing errors. Cross-checking science information ensures reliability, supporting teaching effectiveness and learning progress through precise resources and education.

Purpose: Purpose evaluates intent, avoiding bias. Assessing science motives clarifies relevance, enhancing teaching impact and educational outcomes through objective materials and learning tools.

References: Checking references validates sources, ensuring support. Citing science studies confirms authenticity, boosting teaching reliability and stability through credible education and resources.

13. By giving examples, examine five practical factors which determine the choice of a network topology in a computer laboratory

Scalability: One factor is scalability, supporting growth. A star topology expands easily, like adding science workstations, enhancing teaching efficiency and educational outcomes through flexible systems and learning.

Cost: Cost influences choice, ensuring affordability. Bus topology is cheaper for science labs, improving teaching stability and development through economical solutions and education strategies.

Performance: Performance, like speed, is crucial, ensuring efficiency. Star networks reduce science congestion, boosting teaching quality and learning progress through reliable connections and instruction.

Reliability: Reliability prevents failures, ensuring uptime. Star topology isolates science issues, supporting teaching precision and educational stability through dependable networks and learning tools.

Security: Security protects data, controlling access. Star setups limit science breaches, enhancing teaching reliability and stability through secure systems and educational strategies in labs.

14. Analyze five limitations of using radio broadcast as a teaching resource

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

Coverage Issues: Poor coverage, like signal gaps, hinders access. Science broadcasts miss areas, reducing teaching quality and stability through unreliable delivery and educational progress.

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

Technical Dependence: It relies on equipment, risking failure. Science receivers break, challenging teaching reliability and stability through equipment dependency and educational limitations.

Distraction Risk: Radio distracts with noise, reducing focus. Science lessons compete with interruptions, impacting teaching impact and educational progress through concentration challenges and learning.

SECTION C (40 Marks)

Answer two (2) questions from this section.

15. Identify six methods of assessment in ICS and elaborate how each can be used in the process of teaching and learning ICS

Tests: One method is tests, measuring knowledge. Science quizzes on programming evaluate progress, enhancing teaching effectiveness and educational outcomes through structured assessment and learning in classrooms.

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.

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.

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.

Portfolios: Portfolios compile work, showing growth. Science collections of coding projects track progress, enhancing teaching effectiveness and educational development through comprehensive evaluation and learning.

Presentations: Presentations assess communication, like tech reports. Science demonstrations on systems evaluate skills, boosting teaching quality and learning outcomes through oral assessment and instruction in education.

16. Give detailed explanation on six benefits of ICT in supporting pedagogical processes

Engagement: One benefit is engagement, making lessons interactive. ICT tools, like simulations, captivate students, enhancing teaching impact and educational outcomes through science-based learning and stability.

Efficiency: ICT improves efficiency, streamlining tasks. Science software automates grading, boosting teaching productivity and stability through saved time and educational progress in classrooms.

Access to Resources: It provides resource access, like online materials. Science databases support lesson planning, enhancing teaching quality and stability through comprehensive learning tools and development.

Personalized Learning: ICT enables personalized learning, addressing needs. Science platforms adapt to styles, improving teaching precision and educational outcomes through tailored instruction and progress.

Collaboration: It fosters collaboration, enabling projects. Science networks connect teams, boosting teaching effectiveness and stability through interactive learning and educational strategies in classrooms.

Skill Development: ICT develops skills, enhancing expertise. Science tech training builds proficiency, improving teaching impact and educational outcomes through competent learning and development tools.

17. Account for six factors which a teacher should consider when improvising teaching and learning resources

Student Needs: One factor is student needs, ensuring engagement. Resources for science concepts match abilities, enhancing teaching effectiveness and educational outcomes through relevant materials and learning.

Resource Availability: Available materials, like charts, influence choices. Selecting science tools ensures effective education, supporting teaching precision and learning progress through accessible resources.

Cost-Effectiveness: Budget constraints guide decisions, ensuring affordability. Science materials minimize expenses, improving teaching stability and educational development through economical strategies and learning.

Relevance: Relevance connects resources to goals, like applications. Science visuals align with objectives, enhancing teaching impact and educational outcomes through meaningful learning tools and instruction.

Durability: Durable resources ensure longevity, reducing waste. Science models withstand use, supporting teaching reliability and stability through sustainable education and learning strategies.

Ease of Use: User-friendly resources simplify application, aiding teaching. Science diagrams are clear, enhancing teaching efficiency and educational progress through accessible learning tools and instruction.

18. Evaluate six practical factors that influence the choice of instructional media for distant learners

Accessibility: One factor is accessibility, ensuring reach. Science platforms must be online, enhancing teaching effectiveness and educational outcomes through available resources for remote learning.

Cost: Cost influences selection, ensuring affordability. Science tools must be budget-friendly, improving teaching stability and development through economical media and learning strategies for distant students.

Interactivity: Interactive media, like videos, boosts engagement. Science simulations captivate learners, enhancing teaching impact and educational progress through dynamic instruction for remote education.

Technical Requirements: Compatibility with devices ensures use. Science software needs minimal specs, supporting teaching precision and stability through functional media and learning tools for distance.

Content Quality: High-quality content, like clear tutorials, is crucial. Science materials must be accurate, improving teaching quality and educational outcomes through reliable resources for distant learners.

Feedback Mechanisms: Feedback options, like quizzes, support learning. Science assessments enable progress tracking, enhancing teaching reliability and stability through effective media and educational strategies for remote students.