THE UNITED REPUBLIC OF TANZANIA
NATIONAL EXAMINATIONS COUNCIL
DIPLOMA IN SECONDARY EDUCATION EXAMINATION

740 **MATHEMATICS**

Time: 3 Hours **Friday, 09th May 2014 a.m.**

Instructions

1. This paper consists of sections A, B and C.
2. Answer **all** questions in section A, **two (2)** questions from each of sections B and C.
3. Section A and B carry 30 marks each, section C carries 40 marks.
4. Mathematical tables and non-programmable calculators may be used.
5. Cellular phones are **not** allowed in the examination room.
6. Write your **Examination Number** on every page of your answer booklet(s).

SECTION A (30 Marks)

Answer **all** questions in this section.

1. Use scientific calculator to determine the value of $\left(\frac{\sqrt[3]{0.02e^2}}{\tan 66^0}\right)^{\frac{1}{2}}$ correct to three significant figures.

2. With aid of diagrams, state any two conditions for two triangles to be similar.

3. (a) Using common symbols, give three examples of connectives in Logic statements.
   (b) Draw the electrical circuit represented by the proposition $(p \wedge q) \vee (r \vee s)$.

4. Write three general equations of the figures obtained from the conic sections.

5. Using the standard scores below, write interpretation regarding performance of each student.

Student	Anne	Bahati	Chichi
Standard Scores	0	+1.44	-1.36

6. Give three reasons why teaching materials motivate students in learning mathematics.

7. Mention six criteria for selecting teaching and learning mathematics methods.

8. Briefly explain the relationship between syllabus and scheme of work.

9. Outline three characteristics of good mathematics test items.

10. Differentiate a textbook from a supplementary book as a source of learning materials.

SECTION B (30 Marks)

Answer **two (2)** questions from this section.

11. (a) Given that P(E) is a probability that an event E will happen, and P(E') is a probability that an event E does not happen. Show that $P(E) + P(E') = 1$.
    (b) The probability of two events A and B are such that $P(A) = 0.3$, $P(B) = 0.4$ and $P(A \cup B) = 0.5$; show that A and B are neither independent nor mutually exclusive.

2. (a) Deduce the double angle formula for cosine from compound angle formula.

(b) Determine the solution of the equation $\sin 3x + \sin x = 0$ for value of x from -180^0 to 180^0.

(c) Given that $\cos\theta = \frac{1}{\sqrt{5}}$, evaluate $\cos\left(\theta + 5\frac{\pi}{2}\right)$.

13. (a) Find $\int \sin 3x \cos 2x \, dx$.

(b) Using the knowledge of integration prove that the volume of a cone of height h and base r is $\frac{1}{3}\pi r^2 h$.

14. (a) Find a unit vector to the direction of vector $\underline{a} = 2\underline{i} + \underline{j} - 2\underline{k}$.

(b) Use cross product to find the formula for finding the area of the parallelogram ABCD. Hence, deduce the area of a triangle ABC.

SECTION C (40 Marks)

Answer **two (2)** questions from this section.

15. Describe teaching and learning activities to use when leading students to the proof of the theorem of intersecting chords.

16. By giving four points in each, explain the uses, advantages and disadvantages of lecture method in teaching Mathematics.

17. State six ways a teacher may use to develop students interest towards mathematics learning.

18. Explain six advantages of analysing syllabus, textbook and teachers guide before teaching Mathematics.