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

PHYSICS 1

731/1

Time: 3 Hours **Thursday, 19th May 2011 a.m.**

INSTRUCTIONS

1. This paper consists of sections A, B and C.
2. Answer **all** questions in section A and **two (2)** questions from each of sections B and C.
3. Sections 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).

This paper consists of 4 printed pages

SECTION A (30 Marks)

Answer **all** questions in this section.

1. (a) Distinguish fundamental physical quantities and derived physical quantities.

   (b) The rate of flow (volume per second) of a liquid in a pipe of length ℓ is found to depend on the pressure gradient P, coefficient of viscosity η, and the radius of the pipe r. Using dimensional analysis, find the relationship between the rate of flow and the given quantities.

2. Give the meaning of the following terms:

   (a) Thermionic emission.

   (b) Electron volt.

   (c) Cathode rays

3. (a) Mention two reasons why water is unsuitable as a thermometric liquid.

   (b) The temperature of a substance is $15^0 C$. Convert it into the Fahrenheit scale.

4. (a) State two practical applications of projectile motion.

   (b) A ball is kicked from the ground and moved with initial velocity of 8m/s at an angle of 30^o to the ground. Calculate the distance of the ball from the ground after 60 seconds.

5. (a) Define an "electric shock."

   (b) List two possible causes of death due to an electric shock.

6. State three assumptions of the kinetic theory of an ideal gas.

7. (a) State Kirchhoff's laws of electrical network.

   (b) Write down the benefit of each law stated in (a) above.

8. Mention six purposes of the classroom assessment during teaching and learning of Physics.

9. In teaching and learning Physics, teacher needs to have a plan for teaching. Briefly explain three things the teacher should consider when planning for teaching.

10. Outline six reasons why a physics teacher should prepare and use lesson notes in teaching physics.

SECTION B (30 Marks)

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

11. (a) Distinguish the following terms:
    (i) Transverse and longitudinal waves.
    (ii) Progressive and stationary waves.

    (b) If a plane progressive wave is represented by the equation $y = A\sin 2\pi\left(\frac{B}{\lambda}+\frac{C}{\lambda}\right)$, what does A, B and C represent?

    (c) (i) Calculate the angular separation between the first and second order images of diffraction (fringes) when light of wave length $\lambda = 5.9\times10^{-7}\,m$ is incident normally on a diffraction grating having 6000 lines/slits.
    (ii) State the maximum number of fringes that can be produced by this grating.

12. (a) Explain the difference between the term error and mistake as applied to laboratory measurements.

    (b) State how the mistake can be completely eliminated.

    (c) An experiment was done to find the acceleration due to gravity using the formula $T = 2\pi\sqrt{\frac{L}{g}}$ where, T is the periodic time = 2.22 seconds, L is the length of pendulum = 121.6cm and g is the acceleration due to gravity. Given that the error due to the meter rule is 0.05m and the error due to stopwatch is 0.1sec and the clock losses 3seconds in 5minutes, determine the error in measuring g.

13. Using a diagram, describe a modern form of X-ray tube and identify three uses of it.

14. (a) Give the difference between intrinsic and extrinsic semiconductors.

    (b) Briefly describe with the aid of diagram the mechanism of doping intrinsic semiconductor to get the p-type material.

SECTION C (40 Marks)

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

15. The following table shows examination score obtained by physics student teachers at Monduli T.C.

Name	Pery	Rila	Jery	Anita	Rita
Score	20%	25%	30%	90%	35%

Standardize the examination score for Rila to get his T score.

16. Discuss five classroom challenges experienced by a student teacher during the Block Teaching Practice (BTP) in physics teaching.

17. Prepare 80 minutes lesson plan for form two students on the topic: 'Work, Energy and Power.'

18. Discuss four important factors to be considered in arranging the experiments of Physics subject.