Name: ..... **Index No.** .....

School: ..... **Date:** ..... **Candidate's Sign** .....

232/2
PHYSICS
PAPER 2 (THEORY)
FORM 4
MARCH / APRIL 2013
TIME: 2HOURS

WESTERN ZONE JOINT EXAMINATIONS - 2013 (WEZOJE)

Kenya Certificate of Secondary Education (K.C.S.E)

INSTRUCTIONS TO CANDIDATES

- Write your name admission number and class I the spaces provided
- This paper consists of two sections, A and B.
- Answer ALL the questions in the spaces provided.
- All working must be clearly shown in the spaces provided in this booklet
- Mathematical tables and Electronic calculators may be used.

FOR EXAMINER'S USE ONLY

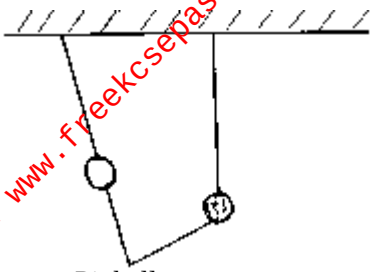
Section	Question	Maximum Score	Candidate's Score
A	1 - 14	25	
B	15	13	
	16	13	
	17	11	
	18	11	
	19	07	
Total			

This paper consists of 8 printed pages.
Candidates should check the question paper to ensure that all pages are printed as indicated and no questions are missing.

SECTION A: (25MARKS)

Answer all the questions in spaces provided.

1. The figure below shows an uncharged pith ball under the attraction of a charged ball.



Pinballs

State and explain what would be observed after the two pith ball touch. (2marks)

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2. Two similar pins were placed one on a wooden block and the other on an iron block. The two blocks were placed near a magnet. Explain the observation noted. (2marks)

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3. A battery is rated 120AH. How long will it work if it steadily supplies a current of 4A. (2marks)

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4. What is meant by the term spherical observation? (1mark)

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5. The human ear can distinguish two sounds as separate only if they need it at least 0.1 seconds apart. How far from a wall must an observer be in order to hear an echo when he shouts. (speed of sound = 330m/s) (3marks)

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6. Calculate the wavelength of the KBC fm radio waves transmitted at a frequency of 95.6 mega Hertz. ($V = 3.0 \times 10^8 m/s$) (2marks)

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7. Give a condition necessary for diffraction of waves to occur. (1mark)

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8. 11 images are formed when two mirrors are inclined at an angle θ between them. Determine the angle θ. (2marks)

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9. A spherical metal sphere is charged positively and brought to contact with the inside surface of a hollow conductor. It is then transferred to the cap of an electroscope. State and explain what is observed on the leaf of the electroscope. (2marks)

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10. Explain why a thin wire feels warm when electric current passes through it for some time. (2marks)

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11. State one difference between the human eye and the camera. (1mark)

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12. State any two ways of increasing the strength of an electromagnet. (2marks)

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13. State one reason why prisms produce better optical instruments than plane mirrors. (1mark)

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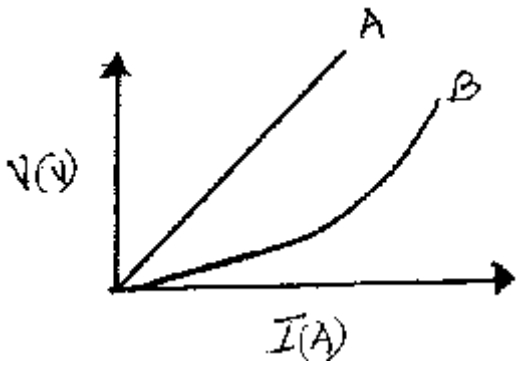
14. The following is a graph of voltage against current for two conductors A and B.



Use the graph to differentiate between the two conductors A and B stating the reason. (2marks)

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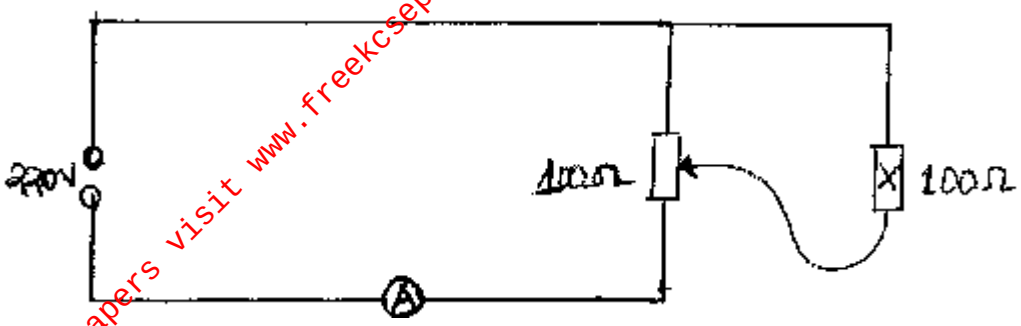
SECTION B: (55MARKS)

Answer all the questions in the spaces provided.

15. In the circuit diagram below, X is a fixed resistor while Y can be varied between 0Ω and 100Ω using a sliding jockey



a) Calculate

i) The minimum possible current in the circuit (3marks)

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ii) The maximum possible current in the circuit (2marks)

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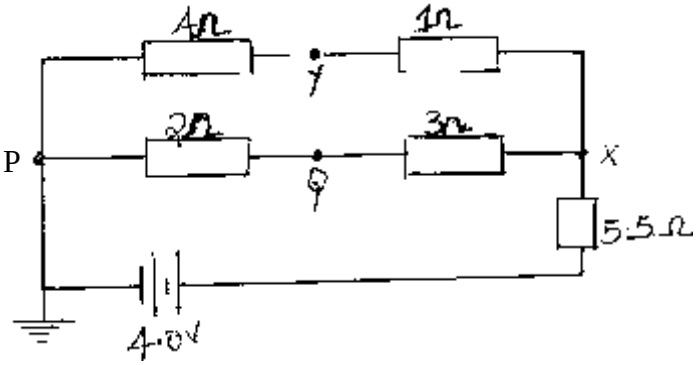
b) The following figure shows an electric circuit in which five resistors are connected to a battery of e.m.f 4.0V and negligible internal resistance.



Determine:

i) The total resistance of the circuit (3marks)

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ii) The potential difference between Y and Q (3marks)

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c) State two factors that affect the resistance of a metallic conductor. (2marks)

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16. a) Define the following terms as used in curved mirrors: (2marks)

i) Principal focus of a concave mirror

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ii) Focal length

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b) By use of a ray diagram, show how a concave mirror may be a dentist mirror. (3marks)

c) An object is placed 12cm from a convex mirror of radius of curvature 20cm. Calculate the position of the image. (3marks)

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d) A lady holds a large concave mirror of focal length 1.8m from her face. State two characteristics of her image in the mirror (2marks)

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e) A boy is standing between two cliffs A and B but nearer to cliff A than B. He stands 160M from wall BA and shouts once. He hears two echoes and discovers that the time interval between the two echoes is 0.8 seconds. Determine how far the boy is standing from cliff B given that the speed of sound in air is 340m/s (3marks)

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17. a) State two factors that affect the capacitance of a parallel plate capacitor. (2marks)

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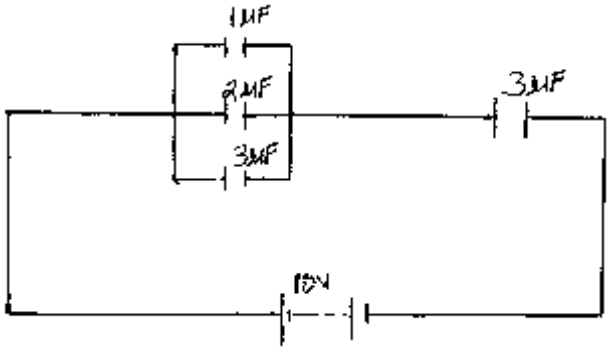
b) The diagram below shows an arrangement of capacitors in a circuit.



Determine;

i) The total capacitance (3marks)

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ii) The total charge (3marks)

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iii) The energy stored by the 2μF capacitor. (3marks)

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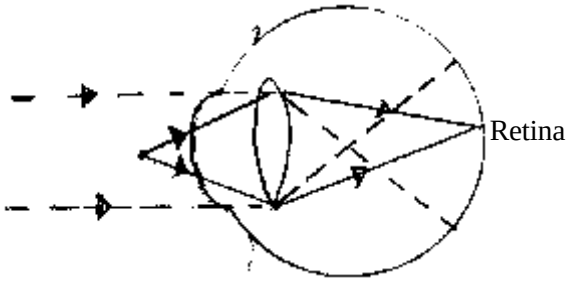
18. a) The figure below shows how rays from a distant and near objects are focused inside a human eye with a certain defect.



i) Name the defect (1mark)

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ii) State two causes of the defect. (2marks)

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iii) Suggest a corrective measure to the defect. (1mark)

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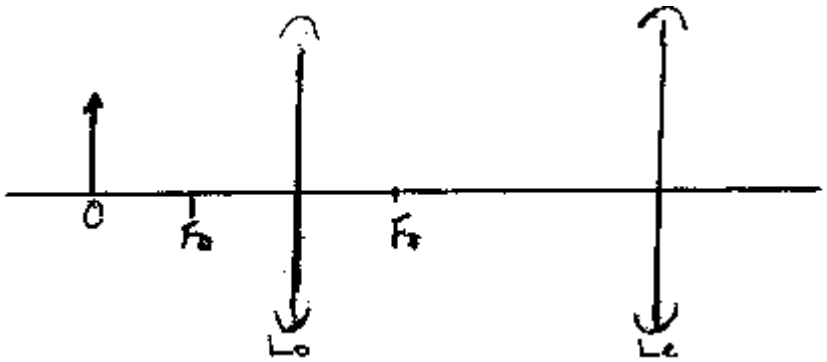
b) The figure below shows an object O placed in front of an objective lens L_o whose focal length f_o is less than f_e, the focal length of the eyepiece L_e. Complete using ray construction how the arrangement would produce a compound microscope (3marks)



c) An object of height 10cm is placed infront of a diverging lens of focal length 25cm and at a distance of 20cm from the lens. Calculate the height of the image formed. (4marks)

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19. a) State Snell's law (1mark)

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b) When does total internal reflection occur (2marks)

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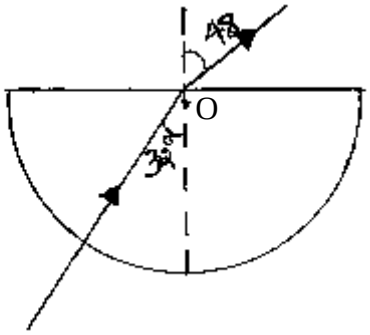
c) The figure below represents a ray of light falling normally on the curved surface of a semi-circular glass block A at an angle of 32^0 at O and emerging into air at tan angle of 48^0.



Calculate the absolute refractive index of the glass of which the block is made. (assume air is a vacuum) (3marks)

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d) Explain why should is audible at night than during the day? (1mark)

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