THE UNITED REPUBLIC OF TANZANIA

PRESIDENT’S OFFICE

REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT – LINDI REGION

FORM FOUR REGIONAL MONTHLY TEST – FEBRUARY 2019.

031/1 PHYSICS 1

TIME: 3HOURS .

INSTRUCTIONS

1. This paper consist of section A, B and C with a total of eleven questions (11)
2. Answer all questions in section A, B and only one (1) question from section C.
3. Calculators, cellular phones and any unauthorized materials are not allowed in the examination room.
4. Write your Examination number on every page of your answer booklet(s), sheet(s) provided
5. Where necessary the following constants may be used
6. Acceleration due to gravity, g = 10m/s2 or 10N/kg
7. Specific heat capacity of mercury is 1395J/kgoc
8. 1g of water is equivalent to 1cm3
9. Pie , π = 3.14

**SECTION A (30 marks)**

1: For each of the following items (i) – (x), choose the correct answer from among the given alternatives and write its letter besides the item number in the answer booklet/ sheet provided

1. Which of the following is not a region of electromagnetic spectrum?
2. Radio waves
3. X – ray
4. Infrared light
5. Ultraviolet light
6. Invisible light waves
7. Which of the following is an example of a scalar quantity?
8. Electric current
9. Force
10. Velocity
11. Displacement
12. Acceleration
13. Why oil is used as lubricants?
14. Has low density
15. It is high viscous
16. It is flammable
17. It is inflammable
18. It is less viscous
19. What quantity of heat is required to raise the temperature of 25kg sample of mercury from 20oc to 30oc?
20. 1,743,750J
21. 348,750J
22. 345,750J
23. 1,550,750J
24. 413,750J
25. A total eclipse of the sun is due to:-
26. The moon coming between the earth and the sun
27. The earth coming between the moon and the sun
28. The moon reflecting light away from the earth
29. The sun coming between the earth and the moon
30. The earth reflecting light away from the moon
31. The weight of a body 20N in air , 15N when totally immersed in water and 18N when totally immersed in liquid. What is the relative density of liquid?
32. 5N
33. 0.4
34. 0.4N
35. 2.5N
36. 0.5
37. A convex mirror always forms
38. Real image only
39. Virtual image only
40. Inverted real image only
41. Magnified virtual image
42. Both real and virtual image at the same time
43. A wire carries a current I horizontally between the magnetic poles N and S which face each other on table

S

N

I

The direction of the force on the wire due to the magnet is

1. From N to S
2. From S to N
3. Opposite to the current direction
4. Vertically upward
5. In the direction of the current
6. What will be the resistivity of a wire of 2metre long with cross – sectional area of 0.50mm2 and a resistance of 2.20Ω
7. 5.5 x 10-7Ωm
8. 6.5 x 10-7Ωm
9. 2.3 x 10-7Ωm
10. 1.1 x 10-6Ωm
11. 5.5 x 10-6Ωm
12. A lens is used to form an image of a bright object on a screen. The effect of covering the top half of the lens with a card is to:-
13. Make the image less bright
14. Make the image go out of focus
15. Make the image disappear
16. Remove the top half of the image
17. Remove the bottom half of the image

2: Match the items in List A with the responses in List B by writing the letter of the correct response besides the item number in the answer booklet(s) or sheet(s) provided

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| --- | --- |
| **LIST A** | **LIST B** |
| 1. Mirage 2. Refractive index 3. Critical angle 4. Floating body 5. Brownian 6. Viscosity 7. The siphon 8. A couple 9. Capillarity 10. Surface tension | 1. The surface of friction between molecules of the same substance which exist on the surface of water 2. Caused by total internal refraction of light 3. Liquids whish are different to stir and do not flow easily 4. Angle of reflection for which the angle of incidence is 900 5. A very thin pipe which enables the hydrometer to float upright in liquid 6. The ratio of sine of angle of refraction to the size of angle of incidence 7. Attraction force which allows the moon to move around the earth 8. The property of water surface to support the needle 9. A glass tube used for releasing an accurate amount of liquid 10. Angle of incidence for which the angle of refraction is 900 11. Consists of two equal and opposite parallel forces and has turning effect 12. Force that causes elastic material to twist 13. Apparent weight is zero 14. Upthrust of a liquid is equal to the apparent weight of the floating body 15. The pull that resists the flow of liquid 16. The ratio of speed of light in air to that in media 17. Tendency of liquid to be drawn into small openings 18. Random motion of water molecules 19. The chain and ball flushing tank 20. Irregular motion of tiny particles suspended in fluid 21. Bending of light which makes objects appear at incorrect position |

3: For each of the following items (i) – (x), fill in the blank spaces by writing the correct answer in your answer sheet

1. The rate of change of displacement is called ………………………………………………..
2. The process whereby the eye can alter its focal length in order to form images of objects at different distance is known as……………………………………………………
3. The rule used to deduce the direction of the magnetic field lines due to solenoid or a circular coil is called
4. The function of an induced coil is to produce ………………………………………………..
5. The whetstone bridge is an electric device used to measure …………………………..
6. A force which causes anticlockwise rotation is said to have a positive …………………………………
7. The kinetic theory of matter has been used to account for electricity, surface tension and ………………………………
8. The quantity of a note produced by musical instrument depends on its fundamental frequency and ………………..
9. The name given to the collection of heavenly bodies that revolve around the sun is ………………………………………..
10. The increase in the average temperature of the world’s atmosphere refers to …………………………

**SECTION B (60 marks)**

4: (a): i/ Explain the terms opaque and translucent materials

Ii/ What is the difference between real and virtual image as formed by curved mirror

(b): i/ Give two reason why convex mirrors are used as driving mirror

Ii/ A convex mirror of focal length 18cm, produce an image on its axis 6cm away from the mirror. Calculate the

position of the object

5: (a): Define the following terms

1. Ampere
2. Coulomb
3. Volt
4. Ohm

(b): i. State Ohm’s law and two (2) of its limitations

1. List three (3) factors that affect the resistance of a wire

(c): In the circuit below, the total resistance between X and Y is 2Ω. Calculate the unknown resistance Q

Q

4Ω

6Ω

X

Y

I = 2A

6: a/ i) Name three (3) basic radiation that occur naturally

(ii) Define mass number and atomic number

b/ Thorium disintegrates in the following manner

90Th 232 88Ra 228 89Ac 228 90Th 228 88R 224

State the particles emitted at each part of the disintegration

c/ Differentiate Nuclear fission from Nuclear fusion.

7: a) Define the following terms as applied in waves

1. Period
2. Amplitude
3. Wavelength
4. Frequency
5. Crest

b) (i) Write the difference between electromagnetic waves and mechanical waves

(ii) Mention four (4) behaviors of waves

8: (a) Define the following terms

1. Electromagnetism
2. The transformer

(b) A current of 0.4 is passed through a step up transformer with a primary coil of 200 turns. A current of 0.1 A is obtained in the secondary coil. Determine the number of turns in the secondary coil and the voltage across if the primary coil is connected to a 240V mains

9: (a) Define the following terms

1. Binding energy
2. Thermonuclear fusion

(b) (i) How does the rate of escape of electrons from a metal relates to its temperature?

(ii) A sample containing 400g of iodine – 131 has a half – life of 8 days. How much of the sample will remain undecayed after 40 days?

(c) A radioactive material is denoted by the symbol 88X 226 . Write down the composition of the nucleus during the end of the following stages of disintegration

1. The emission of an alpha – particles
2. The further emission of a beta – particle

**SECTION C (10 marks)**

10: (a) i) Distinguish between longitudinal and transverse waves

ii) Explain how beats are formed

(b) A light wave is refracted into optically less medium. What change will occur in

1. The frequency
2. The speed
3. The wavelength

(c) i) What is an echo?

ii) A sound is sent out from the ship and its reflection from the floor of the ocean returns one second later.

Assuming that the velocity of sound in water is 1500m/s, how deep is the ocean?

11 (a) i) State the functions of the air springs in a moving coil galvanometer

ii) Explain why moving coil galvanometer is unsuitable for measuring alternating currents

(b) i) Draw the magnetic field lines pattern in a horizontal plane due to a current carrying straight conductor when d.c flow through it.

ii) What would happen on the pattern if a.c were used instead of d.c?

(c) i) What should be done in order to increase the speed of rotation in a d.c electric motor

ii) An electric motor is connected by cable to a generator and produces a current of 10A at 240V. Calculate the resistance of the cable