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THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION

FORM TWO SECONDARY EDUCATION EXAMINATION, 1998

0031 PHYSICS

TIME 2 Hours.

INSTRUCTIONS

1. This paper consists of fifty (50) question in three sections A, B, and C.
2. Answer ALL questions in ALL the three sections.
3. Read the instructions given under each section very carefully.
4. Answers for section C should be written on the answer papers provided and then attach them at the end of this paper.

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SECTION A

This section consists of thirty (30) multiple choice questions. Answer ALL questions in this section.

1. The length between two points cann be measured by using:
   A. a spring balance
   B. a galvanometer
   C. a metre rule
   D. a beam balance ( )

2. The weight of an object
   A. does not change from place to place
   B. changes from place to place
   C. sometimes can change and sometimes remains constant
   D. cannot be zero.

3. A stone is thrown vertically upward with an initial velocity of 14m/s. Neglecting air resistance, the maximum hight reached by the stone will be (Acceleration due to gravity $g = 10m/s^2$)
   A. 140m
   B. 20m
   C. 10m
   D. 9.8m ( )

4. A piece of silver has a colume of $150cm^3$ and a density of $10.5gm/cm^3$. Its mass is
   A. 1575 gm
   B. 157.5 kg
   C. 15.75 kg
   D. 1.575 kg

5. The mass of an empty relative density bottle is X gm. The same bottle weighs Y gm. When full of pure water and Zgm. When full of a certain oil. The relative density of the oil is.
   A. $\frac{X - Z}{X - Y}$
   B. $\frac{Z - X}{X - Y}$
   C. $\frac{Y - X}{Z - X}$
   D. $\frac{Z - X}{Y - X}$ ( )

6. A bus carrying a very heavy load on its topmost part can easily overturn because
   A. It cannot run fast
   B. Its centre of gravity is high
   C. Its centre of gravity is low
   D. Its equilibrium is neutral ( )

7. The following is a "standard" barometer:
   A. Aneroid barometer
   B. Fortin's barometer
   C. Torricellian barometer
   D. Barograph ( )

8. When a given mass of water

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8. When a given mass of water is absorbing latent heat, its temperature.

A. rises fast

B. remains constant

C. falls slowly

D. varies ( )

9. Heat travels through vacuum by

A. convection

B. Conduction

C. Radiation

D. Conduction and Radiation ( )

10. If $X^{o}C = Y^{o}F$, Then

A. $X = \frac{5}{9}(Y - 32)$

B. $X = \frac{5}{9}(Y + 32)$

C. $X = \frac{9}{5}(Y - 32)$

D. $X = \frac{9}{5}(Y + 32)$ ( )

11. $100^{o}F$ is equal to

A. $73.3^{o}C$

B. $47.8^{o}C$

C. $37.8^{o}C$

D. $33.3^{o}C$ ( )

12. The rate at which moisture evaporates from the skin does not depend on

A. Amount of moisture on the skin

B. Temperature

C. Amountoof water vapour in the air

D. Rate of movement of air over the skin ( )

13. A square hole is made on a metal plate. If the plate is heated

A. the hole will becope larger

B. the hole will remain at the same size

C. the hole will become smaller

D. the hole will become circular ( )

14. The anomelous expansion of water is noted at

A. $96^{o}C$ to $100^{o}C$

B. $28^{o}C$ to $32^{o}C$

C. $8^{o}C$ to $12^{o}C$

D. $0^{o}C$ to $4^{o}C$ ( )

15. The coefficient of volume expansion of oxygen gas is

A. less than that of nitrogen gas

B. equal to that of nitrogen gas

C. greater than that of nitrogen gas

D. sometimes less than taht of nitrogen gas but at other times greater than that of nitrogen gas.

16. Charles' law relates the following variables of a gas

A. Pressure and volume

B. Pressure and temperature

C. Volume and temperature

D. Expansivity and pressure.

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17. Boyle's law relates the following variables of a gas

A. Volume and pressure

B. Volume and temperature

C. Pressure and temperature

D. Expansivity and temperature ( )

18. Relative humidity of air is equal to

A. $\frac{\text{Saturated vapour pressure at ice point}}{\text{Saturated vapour pressure at air temperature}}$

B. $\frac{\text{Saturated vapour pressure at standard temperature}}{\text{Saturated vapour pressure at air temperature}}$

C. $\frac{\text{Saturated vapour pressure at dew point}}{\text{Saturated vapour pressure at air temperature}}$

D. $\frac{\text{Saturated vapour pressure at normal temperature}}{\text{Saturated vapour pressure at air temperature}}$

19. A liquid stored in a thermost flask does not lose or gain heat for seve al hours if the liquid is

A. Hot only

B. Cold only

C. Warm only ( )

D. At any temperature

20 The radiating powes of different surfaces may be compared by means of

A. the Leslie's cube experiment

B. the smoke - in - a box experiment

C. Hope's experiment

D. both Hope's experiment and Leslie's cube experiment

21. Standard temperature and pressure means

A. 0^oK and 76 cm of mercury

B. 0^oF and 76 cm of mercury ( )

C. 0^oC and 76 cm of mercury

22. If the coefficients of static and dynamic friction between two surfaces are represented by US and UD respectively, then

A. US = UD

B. US > UD

C. US < UD

D. Sometimes US - Ud sometimes UD > UD

23. Magnetic substances

A. attract each other before and after magnetisation

B. repel each other before and after magnetisation

C. are made of pure metal

D. can be magnetised and demagnetised. ( )

24. Whether an electric charge is positive or negative can be found out by using.

A. a thermometer

B. a gold - leaf electroscope

C. a hydrometer ( )

D. a periscope

25. Diffusion in liquids supports the theory that molecules

A. are very small spheres

B. move at very high speeds

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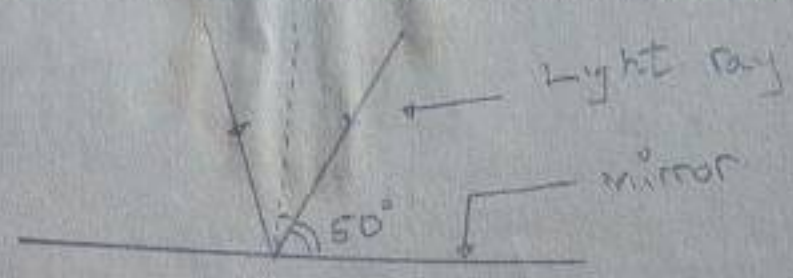
25 C. attract one another

D. are in constant motion ( )

26. The angle of incidence i (in degrees) in the figure below is equal to



A. 30°

B. 40°

C. 50°

D. 60° ( )

27. After passing through a concave lens, a parallel beam of light

A. Converges

B. Forms a real image

C. Diverges

D. Diffuses ( )

28. The angle of dip at the Equator is normally equal to

A. 0°

B. 90°

C. 180°

D. 270°

29. An object placed 20 cm. in front of a convex mirror of focal length 15 cm. gives rise to an image which is

A. magnified and erect

B. magnified and inverted

C. diminished and inverted

D. diminished and erect. ( )

30. A ray lights is reflected from a plane mirror. If the mirror is rotated through 30°, the reflected ray will rotate through.

A. 0°

B. 15°

C. 30°

D. 60°

SECTION B

This section consists of fifteen (15) matching questions. Answe ALL questions in this section.

The statements in numbers 31. - 35 describe the physical phenomena or processes listed below. Match each of the statments with the correct phenomenon or process by writing the letters A B C D E F or G against it.

A. Inertia

B. Acceleration

C. Polarization

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D. Buoyance

E. Local action

F. Lateral inversion

G. Colour blindness

31 The rate of change of velocity per unit time ( )

32. The tendency of a body to remain at rest or in motion if disturbed. ( )

33. The formation of H_2 layer in cells on to Cupole and setting a back e.m.f.[2] ( )

34. The tendency of all bodies immersed in fluid to be supported partly in their weight. ( )

35. The formation of local cells as a result of H_2 bubble formation due to impurities (i.e Fe, C) on Zinc (Zn) pole. ( )

The group of words numbered 36 - 40 give the proper definitions of the physics concepts given below:
Match each of the group of words with the correct concept by writing letters A B C D E F or G against it.

A. Pressure

B. Upthrust

C. Power

D. Temperature

E. Magnetic field

F. Momentum

G. Kinetic energy

36. The degree of hotness or coldness of a body ( )

37. The rate of doing work ( )

38. The space in which the magnetic effects of attraction or repulsion is detected.

39. Force acting per unit area ( )

40. The product of mass and its velocity.

The [illegible] statement 41 - 45 are leading to definitions of the words A B C D E or F. Match against each sentence with these corresponding letters.

A. Mechanical advantage

B. Velocity ratio

C. Efficiency

D. Neutral equilibrium

E. Thermometer

F. Hydrometer

41. The ratio of the distance moved by effort to the distance moved by load.

42. The ratio of the work done on the load to the work done by the effort.

43. The body remains where it is after being displaced slightly.

44. The ratio of the load to the effort.

45. Is an instrument used to measure temperature.

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SECTION C

This section consists of five (5) short answer questions. Answer ALL questions in this section in the answer papers provided.

46. Summarise the results of Leslie's cube experiment.

47. (a) A man applied a force of 100N on a motion less wall for 15 seconds. What is the total work done by the man?

48. (b) A certain machine wa operated at 1 kilowatt for 4 seconds. What is the total work done by the machine?.

48. (a) What causes atmospheric pres ure?

(b) The pressure of the atmosphere at a certain Town is 76 cm. of m roury. Express this pressure in SI units given that mercury has a density of 13600kg ./m^3 and th t gravi ational acceleration is $10m/s^2$.

49. Explain clearly and with the aid of illustrations how each of the following is formed:

(a) a partial solar eclipse

(b) a total solar eclipse

50. Draw circuits which illustrate:

(a) four resistors connected in parallel

(b) four resistors connected in series

(c) a battery connected in series with an ammeter.