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THE UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION
FORM II SECONDARY EDUCATION EXAMINATION, 1987

0031

PHYSICS

TIME 2 Hours.

INSTRUCTIONS

1. This paper consists of fifty (50) questions in three sections; A, B, and C.
2. Answer ALL questions in all the three sections.
3. Read the instructions given under each section ver carefylly.
4. Answer sheets [illegible] for section C should be written on the answer sheets 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. Acceleration is the rate of change of
   A. position
   B. displacement
   C. speed
   D. velocity ( )

2. A body moves from rest with a uniform acceleration of $10m/s^2$. During the first 8 seconds the body covered a distance of
   A. 320m
   B. 302m
   C. 230m
   D. 203m ( )

3. The density of a substance may be given in terms of its volume V and mass M as,
   A. $M \times V$
   B. $V \times \frac{1}{M}$
   C. $M \times \frac{1}{V}$
   D. $\frac{1}{M} \times \frac{1}{V}$ ( )

4. If the density of mercury is 13.5 gm/cm^3, then the volume of 1 kg. of mercury is
   A. 0.07 cm^3
   B. 0.74 cm^3
   C. 7.41 cm^3
   D. 74.07 cm^3

5. In order to measure the length of your desk accurately, you need a
   A. vernier calliper
   B. micrometre screw gauge
   C. metre rule
   D. metre bridge ( )

6. A body of mass 30 kg is supported 50m above the ground. If we take the acceleration due to gravity as $10m/s^2$, the potential energy possessed by the body is
   A. 15000j
   B. 1500j
   C. 900j
   D. 800j ( )

7. The kinetic energy of a body of mass 5 kg. moving at velocity 10m/s is
   A. 15j
   B. 50j
   C. 250j
   D. 500j ( )

8. The liquid pressure at the inside bottom of a beaker that is half - filled with some liquid
   A. increases if the quantity of liquid in the beaker is increased.
   B. decreases if the quantity of liquid in the beaker is increased.
   C. increases if the density of the liquid is decreased
   D. decreases if the density of the liquid is increased. ( )

9. The aneroid barometer makes use of
   A. partial vacuum and mercury
   B. partial vacuum and alcohol
   C. partial vacuum and water
   D. no liquid at all. ( )

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10. If the space above the mercury column in a Fortin's barometer contains some air, the readings of the barometer will be
    A. greater than they should be
    B. less than they should be
    C. as accurate as they should be
    D. sometimes greater and sometimes less than they should be. ( )

11. The operation of the siphon depends upon
    A. Archimede's principle
    B. atmospheric pressure
    C. diffusion
    D. osmosis. ( )

12. A body that has no acceleration must be
    A. at rest
    B. in uniform motion
    C. having zero displacement
    D. at rest or in uniform motion ( )

13. The SI unit of energy is
    A. N/M B. J C. W D. kg. m ( )

14. If a certain machine has mechanical advantage MA, velocity ratio VR and efficiency E, then
    A. MA = E X VR
    B. E = MA X VR
    C. VR = E X M
    D. $\frac{VR}{MA}$ ( )

15. The amount of work can one do in one hour is a measure of his/her
    A. force
    B. power
    C. energy
    D. strength. ( )

16. For any two perfectly smooth surfaces
    A. the coefficient of static friction = 1
    B. the coefficient of kinetic friction = 1
    C. the coefficient of static friction is greater than zero ( )
    D. the coefficient of kinetic friction = 0

17. A body of mass 10kg. that is moving at velocity 2 m/s has linear momentum which if given in SI units would have a magnitude equal to
    A. 0.2 B. 5 C. 20 D. 40 ( )

18. Energy has the same SI units as
    A. work B. torque C. inertia D. momentum ( )

19. The molecules of water at $10^{o}C$ have less kinetic energy than the molecules of
    A. ice at $0^{o}C$
    B. water at 5^{o} C
    C. water vapour
    D. water /$34^{o}F$ ( )

20. If the temperature of body A is higher than that of body B, then the total thermal energy of body A is
    A. greater than that of body B
    B. not necessarily greater than that of body B

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C. greater than or equal to that of body B
D. at least equal to that of body B. ( )

21. Several images of the same object are formed by means of mirrors in
A. the pinhole camera
B. proof - planes
C. virus
D. kaleidoscopes. ( )

22.

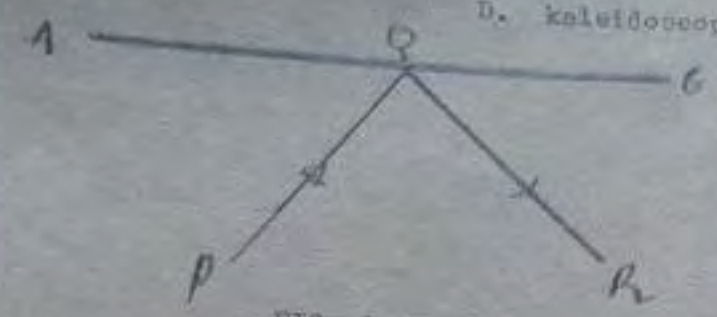


FIG 1

Fig. 1 above shows a ray of light PQ which is reflected along QR by the plane mirror AB. If AB is rotated through an angle of 40°, the reflected ray QR will be rotated through an angle of

A. 80° B. 50o C. 40° D. 20° ( )

23. Knowledge about conduction, convection and radiation is important in the construction of a
A. thermometer
B. thermos flask
C. radiator
d. thermostat. ( )

24. According to Boyle's law, the volume V of a given gas is related to the pressure P of the same gas at constant temperature by
A. P & V
B. $\frac{1}{P}$ & $\frac{1}{V}$
C. P & $\frac{1}{V}$
D. P = V ( )

25. The pressure of any particular fluid varies with its
A. height of the column
B. acceleration due to gravity
C. density ( )
D. mass.

26. The fact that pressure affects boiling and freezing points of liquids is made use of in
A. hygrometers
B. maximum - and - minimum thermometers
C. hypsometers ( )
D. pressure cookers.

27. Three examples of magnetic substances are
A. iron, gold and steel
B. iron, nickel and steel
C. iron, copper and steel ( )
D. iron, rubber and nickel

28. Magnetic fields can easily be mapped out using
A. fine pieces of dry paper
B. fine dust particles
C. copper filings ( )

D. Iron filings.

29. There is no place in Tanzania where the local angle of declination is
A. between - 10° and 60°
B. between 20° and 180°
C. between 0° and 40°
D. between 0° and 180° ( )

30. In practice it is possible to change
A. magnetic substances only
B. non - magnetic substances only
C. both non - magnetic and magnetic substances ( )
D. soft iron and steel only.

SECTION B

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

The objects stated in numbers 31 - 35 belong to the classes of levers listed below. Match the objects with the correct classes of levers by writing the letter A, B or C against each object.

A. First Class levers
B. Second Class levers ( )
C. Third Class levers

31. Human arm ( )
32. A wirecutter ( )
33. A wheelbarrow ( )
34. A steelyard ( )
35. A nutcracker ( )

The list below gives the SI units of the physical quantities numbered 36 - 40. Match each of the physical quantities with the correct unit by writing the letter A, B, C, D, E, F, G, or H against it.

A. Watt
B. Joule
C. Metre per Second per second
D. Metre per second
E. Kilogramme
F. Kilogramme metre per second per second
G. Kilogramme metre per second
H. Newton.

36. Acceleration ( )
37. Force ( )
38. Power ( )
39. Mass ( )
40. Work ( )

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The group of words numbered 41 - 45 are the definitions of the terms listed below. Match each group of words with the Correct term by writing the letter A, B, C, D, E, or F against it.

A. Distance
B. Displacement
C. Speed
D. Velocity
E. Terminal velocity
F. Acceleration.

41. Distance from a point in a specified direction ( )
42. The change in distance per unit time. ( )
43. The change in displacement per unit time. ( )
44. The rate of change of velocity. ( )
45. The Constant velocity attained by a body falling through a fluid ( )

SECTION C

The section consists of five (5) short answer questions. Answer ALL questions in this section on the answer sheet of paper provided.

46. (a) State Archimedes principle.
(b) A certain lipuid is poured into a 1 litre measuring cylinder up to the 85 c.c mark. A hydrometer of mass 9.0 gm. is then floated into the measuring cylinder in order to measure the relative density of the liquid. If the hydrometer reads 1.8, up to what level does the liquid in the cylinder rise? (Density of pure water = 1000 kg/m^3).

47. (a) State Newton's second law of motion.
(b) A body moving at uniform speed of 10 m/s is subjected to a uniform retardation of 2 m/s^2. How much distan e will be covered by the body before it is brought to a stop by the retarding force?

48. Describe the Brownian motion experiment and state one conclusion that may be drawn from this experiment.

49. (a) How can several images of one object be formed at the same time by means of plane mirror (s)?
(b) Explain, with the help of a suitable diagram, the princi le upon which a periscope operates.

50 Mention one important application of
(i) permanent magnets
(ii) temporary magnets
(iii) the electrophorus.
(b) Briefly explain how you would
(i) shield a watch from external magnetic fields
(ii) make a metal sphere have a net negative electric charge.