Somali Federal Ministry of Education, Culture & Higher Education

Form Four National Standardized Examinations.

MAY / JUNE 2022

SUBJECT: PHYSICS

TIME 2 HOURS

INSTRUCTION: Answer all questions in the ANSWER BOOKLET

Part one: Circle the letter of the correct answer (50 marks)

1. For a periodic motion, the time taken to make one complete cycle is called
   A. Frequency. B. Period. C. Amplitude. D. Angular frequency.
2. If Hassan transported a simple pendulum to the moon, then the time period
   A. Increases B. Decreases C. Remains the same D. Halved.
3. The numBer of neutrons in $technetium - 99$ $(^{99}_{43}Tc)$ is
   A. 43 B. 65 C. 50 D. 56
4. The process by which a heavy unstable nucleus splits into two or more smaller nucleus is
   A. Nuclear fission B. Nuclear fusion C. Reactor D. activation
5. An electron is travelling at a speed of $4 \times 10^{7} m/s$. The De-Broglie's wave length.($use\ h = 6.63 \times 10^{-34} Js, \mathrm{M}_e = 9.1 \times 10^{-31} kg$) is :
   A. $3.5 \times 10^{-11} m$ B. $2.4 \times 10^{-11} m$ C. $3.0 \times 10^{-11} m$ D. $1.8 \times 10^{-11} m$
6. The process by which electrons are emitted from the surface of a metal when an electromagnetic radiation falls on it is
   A. Photon B. Photoelectric effect C. Photocell D. Photovoltaic
7. Electronic circuits deal with the flow of electric charges through a _____Conductor.
   A. Metal B. Non-metal C. Metalloids D. Air
8. The process by which an electronic device converts DC power into AC power of any frequency is called
   A. Generation B. Rectification C. Adaptor D. Amplification
9. In forward biasing, the potential barrier is
   A. Increased B. Reduced C. Constant D. Too large.
10. The measurement of the total magnetic field which passes through a given Area is
    A. Magnetic field. B. Magnetic flux. C. Magnetic field lines. D. Materials.
11. The potential difference produced by the battery is
    A. Electric force B. Electromagnetic C. Electromotive force D. Electric force.

12. A straight wirE 0.8m long moves with a speed of $40m/s$ vertically on a horizontal vertical magnetic field of 0.5T. the induced Emf is

A. 14V B. 15V C. 16V D. 17V

13. The source of direct current is

A. Batteries B. Generators C. Sun D. Air

14. A machine that converts a mechanical energy into electrical energy is called

A. Inductor B. Motor C. Electric generator D. Oscillators

15. In order to produce a white light from the dispersed colours, we use

A. Dispersion B. Recombination C. Colours D. Pigment

16. When a white light is incident on a blue object, the object will appear

A. Green B. Blue C. Red D. Yellow.

17. To detect an original diamond from a fake diamond, we use

A. Infrared radiation B. Ultraviolet radiation C. Radio wave D. Microwave.

18. A capacitor is connected to $120V, 60Hz$ source. If its capacitance is 20μF. the capacitive reactance is

A. $1.33 \times 10^2\Omega$. B. $1.8 \times 10^2\Omega$ C. $1.9 \times 10^2\Omega$ D. $3 \times 10^2\Omega$

19. The reflection of sound is called

A. Reverberation B. Refraction C. Diffraction D. Echo

20. The frequency range of hearing in humans is between

A. 30Hz to 30Khz B. 40Hz to 40KhZ C. 20Hz to 20 KHz. D. 50Hz to 50kHz

21. Which mirror can produce an erect image with magnification equal to one?

A. Concave mirror B. Plane mirror C. Convex mirror D. Concave lens

22. If the angle of reflection is 30^0 then, the angle of incidence is

A. 90^0 B. 60^0 C. 450^0 D. 30^0

23. If the image formed by a lens is always diminished and erect, the nature of the image is

A. Concave lens B. Convex lens C. Biconvex lens D. Plano convex lens

24. Which of the following are sources of light?

A. Mountain B. Wall C. Insects D. Sun

25. A sound wave has a frequency of 200Hz and a speed of $400m/s$, its wave length is

A. 4m. B. $\frac{1}{2}$m. C. $2m$ D. 0.8×10^4m

Part two: Match Column A and Column B_____(10 marks)

Column A	Column B
1. The mechanical energy of a system is 150J. What is the kinetic energy of the system at the rest position?	( ) Cathode rays
2. Mass oscillates on a horizontal spring with a period $T = 2.0s$. what is the frequency?	( ) Kinetic energy is 150J
3. The atomic number of uranium isotope $^{238}_{92}U$ is	( ) Alpha
4. Which of the following particles are protons	( ) 0.5Hz
5. A stream of electrons at higher speed from a heated cathode is called	( ) 92
6. The process of adding impurity atoms to a pure semiconductor is called	( ) Weber
7. The region where the electrons and holes are emptied is called	( ) red
8. The SI unit of magnetic flux is	( ) depletion layer
9. Red filter absorbs all the colours of white light except	( ) $3x10^8$ m/s
10. The speed of light in a vacuum is	( ) doping

Part three: Structure Questions_____(40 marks)

Question one: oscillatory motion

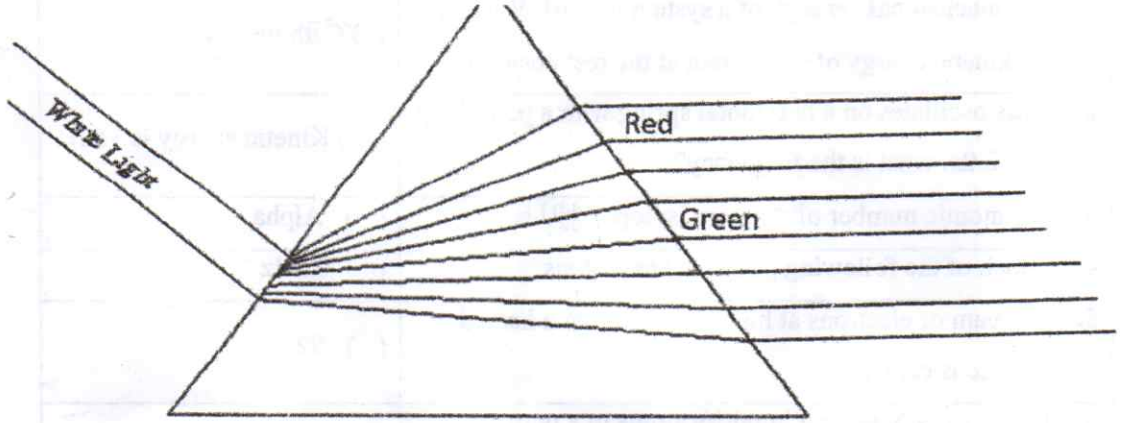
1. Write the formula of Hook's Law.___?_____(4 marks)
2. How much mass should be at the end of a spring of $K = 100N/m$ in order to have a period of $2s$._____(5 marks)

Question two: Reflection of light

1. State the types of reflection of light._____(2 marks)
2. Distinguish between real image and virtual image. _____(4 marks)
3. Farah stands at distance of 5m in front of a convex mirror of focal length 10m. calculate
   A. Position and magnification of image. _____(3 marks)
   B. State it's Nature. _____(3 marks)

Question three: Dispersion of light

1. Use the following prism below and then complete the missing colors.____(5 marks)



2. Use the information in the table below to fill the gabs _____(5 marks)

Visible light	Radio wave	infrared radiation	X-rays	Gama rays

A. It is used in photosynthesis process in the plants.....

B. It is used in TV remote controls.....

C. It locates bone fractures.....

D. It is used in communication.....

E. It is used for treatment of cancer cells.....

3. Distinguish between monochromatic light and polychromatic light_____(4 marks)

Question four: Sound wave

1. Determine the speed of sound at 40^0C_____(3 marks)
2. What is the relation b/w the frequency of a sound wave and its pitch? ____(2 marks)