



**CHRIST HIGH SCHOOL PLOT 5, CHS
STREET, KM 32, ABUJA-KEFFI ROAD
UKE, NASARAWA STATE**

**END OF SECOND TERM
EXAMINATION 2024/2025
ACADEMIC SESSION**

SUBJECT: PHYSICS

CLASS: SS 2

TIME: 2 Hours 15 minutes

NAME.....

CANDIDATE'S ADMISSION NO.

INSTRUCTION

**Write your name and number in the space
provided on your answer booklet. Write
your name on any extra sheet used.**

Answer all questions.

**At the end of the examination, staple all
your work securely together.**

FOR EXAMINER'S USE

Total Score:

+

SECTION A: ANSWER ALL QUESTIONS

1. Absolute zero temperature can be defined as the temperature
 - (a) at which the average kinetic energy of its particles making up the body is zero
 - (b) at which pure water changes to ice at standard atmospheric pressure
 - (c) of zero-degree Celsius scale
 - (d) at which pure water and steam co-exist
 - (e) at zero degree Fahrenheit
2. The temperature at which the pressure of the water is equal to the saturation vapour pressure is called
 - (a) the dew point
 - (b) boiling point
 - (c) condensation point
 - (d) humidity
 - (e) freezing point
3. The measure of the wetness of the atmosphere is called
 - (a) the dew point
 - (b) boiling point
 - (c) condensation point
 - (d) humidity
 - (e) evaporation

4. Water of mass 120g at 50 c is added to 120g of water at 10 c and the mixture is well stirred. Calculate the temperature of the mixture

(a) 60° C

(b) 40° C

(c) 30° C

(d) 10° C

(e) 20° C

5. A waterfall is 630m high. What is the change in temperature of a quantity of water that falls from the top of the waterfall? ($g=10\text{ms}$)

(a) 0.15° C

(b) 1.50° C

(c) 15.00° C

(d) 21.00° C

(e) 25.00° C

6. When 30g of water at 30 c is mixed with 12g of hot water, the resulting temperature of the mixture is 40 c. Calculate the temperature of the hot water assuming no loss of heat to the surroundings

(a) 35° C

(b) 44° C

(c) 55° C

(d) 65° C

(e) 75°C

7. How long will it take to heat 3kg of water from 28°C to 88°C using an electric kettle, which taps 6A from 210V supply

(a) 5.6minutes

(b) 9.6minutes

(c) 10.0minutes

(d) 19.3minutes

(e) 25.6 minutes

8. The amount of heat given out or absorbed when a substance changes its state without a change in temperature is called

(a) latent heat

(b) heat capacity

(c) specific latent heat

(d) specific heat capacity

(e) latent heat of fusion

9. Calculate the energy required to vaporize 50g of water initially at 80°C

(a) 113000J

(b) 117200J

(c) 234400J

(d) 420000J

(e) 11300J

10. Which of the following physical quantity affects the saturated vapour pressure of a liquid?

- (a) temperature
- (b) volume
- (c) mass
- (d) density
- (e) all of the above

11. Water in a pressure cooker boils at a temperature higher than 100 c. This is because

- (a) heat supplied is increased
- (b) rate of heating reduced
- (c) cooker maintains a higher pressure
- (d) cooker is used at high altitude
- (e) none of the above

12. A hygrometer is an instrument used to measure

- (a) dew point
- (b) temperature
- (c) relative humidity
- (d) vapour pressure
- (e) atmospheric pressure

13. The phenomenon whereby the water vapours in the atmosphere is cooled down to its dew point in the air to reduce visibility to less than 200m is

- (a) hail
- (b) cloud
- (c) snow
- (d) mist
- (e) fog

14. A gas which obeys gas laws, occupies a volume V cm at a pressure of P mmHg at room temperature. If the volume increases to $3V$ when the temperature and mass of the gas is fixed, calculate the pressure at the new volume

- (a) $2P$
- (b) $3P$
- (c) $P/2$
- (d) $P/3$
- (e) P

15. The volume of a given mass of an ideal gas at 327K and 9.52×10^5 Pa is 40cm^3 . Calculate the volume of the gas at 273K and 1.034×10^5 Pa

- (a) 68.23cm^3
- (b) 47.91cm^3
- (c) 44.60cm^3
- (d) 307.5cm^3

(e) 100.22cm^3

16. The volume and pressure of a given mass of gas at 120°C is 1200cm^3 .

Calculate its volume at 100°C if the pressure remains constant

(a) 300 cm^3

(b) 400 cm^3

(c) 1000 cm^3

(d) 1600 cm^3

(e) 1800 cm^3

17. The volume and pressure of a given mass of gas at 27°C are 76 cm^3 and

80cmHg respectively. Calculate its volume at 0°C and 760mmHg

(a) 36.2 cm^3

(b) 72.8 cm^3

(c) 100.0 cm^3

(d) 808.9 cm^3

(e) 1200.5 cm^3

18. When the pressure of a fixed mass of gas is doubled at constant temperature,
the volume of the gas is

(a) increased four times

(b) double

(c) unchanged

(d) halved

(e) zero

19. An electromagnetic radiation has a speed of 3×10^4 m/s and a frequency of 10 Hz, calculate its wavelength

(a) 3.3×10^2 m

(b) 3.0×10^2 m

(c) 3.0×10^4 m

(d) 3.3×10^3 m

(e) 3.0×10^3 m

20. Mercury has an advantage over the liquids as thermometric liquids because it

(a) has low expansivity

(b) has higher density

(c) vaporizes easily

(d) has relatively low freezing point

(e) it is opaque in nature

21. A body oscillates in simple harmonic motion according to the equation $y = 0.01 \sin 2\pi x$ where x is expressed in metres. What does 0.01 represents

(a) velocity

(b) frequency

(c) period

(d) amplitude

(e) wavelength

22. Compressions and rarefactions are terms associated with

- (a) transverse waves
- (b) electromagnetic waves
- (c) longitudinal waves
- (d) water waves
- (e) light waves

23. Which of the following properties explains the change in speed and direction of the waves

- (a) diffraction
- (b) reflection
- (c) refraction
- (d) interference
- (e) polarization

24. A wave represented by the equation $y = 0.5 \sin 0.4\pi(x-60t)$ where the distance (x) is measured in centimeters and time (t) in seconds. What is the wavelength of the wave?

- (a) 0.2cm
- (b) 0.4cm
- (c) 0.8cm
- (d) 4.0cm
- (e) 5.0cm

25. If two waves of equal frequency and amplitude travel in the opposite directions along a string, the wave set up in the string is called

- (a) transverse
- (b) progressive
- (c) longitudinal
- (d) resonance
- (e) stationary

26. The amplitude of a wave is the

- (a) distance between two successive trough of the wave
- (b) separation between adjacent particles
- (c) maximum displacement of the wave particle from the equilibrium displacement
- (d) distance travelled by a wave in a complete cycle of its motion
- (e) time taken for the to complete one cycle

27. Which of the following is/are common to all waves? I. diffraction II. Refraction III. Interference

- (a) I only
- (b) III only
- (c) I and III only
- (d) I and II and III
- (e) I, II and III

28. Virtual image is one

- (a) formed by the intersection of actual rays
- (b) which is not visible to the eye
- (c) through which the rays of light do not pass
- (d) which can be formed on the screen
- (e) none of the above

29. A ray of light strikes a plane mirror normally. If the mirror is rotated through an angle of 20° , what is the angle through which the reflected ray rotates?

- (a) 10°
- (b) 20°
- (c) 40°
- (d) 60°
- (e) 80°

30. A man 1.74m tall stands 3m in front of a mirror 1m long. What is the size of his image?

- (a) 5.22m
- (b) 1.74m
- (c) 0.74m
- (d) 0.58m
- (e) 1.0m

31. The inverse of the time required for a wave to complete one full cycle is called

- (a) Wave length

- (b) Period
- (c) Frequency
- (d) Amplitude
- (e) Phase

32. Which of the following is not a mechanical wave?

- (a) Wave propagated in a stretched string
- (b) Waves in closed pipes
- (c) Radio waves
- (d) Water waves
- (e) Sound waves

33. If V is the velocity of a wave, λ its wavelength and T its period, the V , λ and T are related by the expression

- (a) $\lambda = VT$
- (b) $\lambda = \frac{V}{T^2}$
- (c) $T^2 = \lambda V$
- (d) $V = \lambda T$
- (e) $V = \frac{T}{\lambda}$

34. Transverse and longitudinal waves travelling in the same direction in a medium differ essentially in their

- (a) Wavelength
- (b) Amplitude
- (c) Frequency
- (d) Direction of vibration of the particles of the medium

(e) Period of vibration of the particles of the medium

35. Which of the following is not a property of transverse waves?

(a) Compression

(b) Period

(c) Amplitude

(d) Wavelength

(e) Frequency

36. A rod or spoon appears bent or broken when it is partially immersed in water due to

(a) Reflection

(b) Refraction

(c) Diffraction

(d) Polarization

(e) Interference

37. All are precaution taken when conducting an optical experiments except

(a) Ensuring the image focused on the screen is blur

(b) Avoiding error due to parallax in measuring with the metre rule

(c) Ensuring a proper alignment of object, lens or mirror, and screen

(d) Ensuring a sharp image is properly focused on the screen

(e) Optical pins should be vertical and well spaced

38. When a ray of sunlight passes obliquely through a rectangular glass block,

(a) It emerges without displacement parallel to the incident ray

(b) It gets dispersed into seven visible colours without dispersion

- (c) It deviates without dispersion
- (d) It gets laterally displaced, and the emergent ray is parallel to the incident ray
- (e) Both dispersion and deviation take place

39. A ray of light travels from glass to water. What other condition is required for this ray to be totally internally reflected? The

- (a) Angle of incidence in the denser medium must be equal to 30°
- (b) Angle of incidence at the glass-water boundary must be greater than the critical angle for the two media
- (c) Incident ray must lie along the boundary of the two media
- (d) Ratio of the sine of angle of incidence to the sine of angle of refraction must be equal to the sine of the critical angle
- (e) Incident ray must strike the boundary between the two media perpendicularly

40. The ratio $\frac{\sin i}{\sin r}$ is called

- (a) Reflective index
- (b) Refractive index
- (c) Reflective frequency
- (d) Refractive frequency
- (e) Diffractive index

41. ----- is the angle of incidence in the denser medium when the angle of refraction in the less dense medium is 90°

- (a) Normal angle
- (b) Apparent angle
- (c) Critical angle
- (d) Real angle
- (e) Deviation angle

42. The following are good conductors of heat except.

- (a) steel
- (b) aluminum
- (c) copper
- (d) wool
- (e) none of the above

43. Which of the following surfaces will absorb radiant heat energy best?

- (a) White
- (b) Red
- (c) Yellow
- (d) Black
- (e) Blue

44. Which of the following explains why a thick glass cup cracks when boiling water is poured into it?

- (a) Large increase in the heat capacity of the cup
- (b) High density of water
- (c) Unequal expansion of interior and exterior walls of the cup
- (d) Anomalous expansion of water
- (e) Greater specific latent heat capacity of water compared with that of glass.

45. In which of the following is the expansion of solids a disadvantage?

- (a) The fitting of wheels in rims
- (b) Fire alarms
- (c) The thermostat
- (d) The bimetallic thermometer
- (e) The balance wheel of a watch

46. What is the angular speed of a body vibrating at 50 cycles per second;

- (a) $200 \pi \text{ rads}^{-1}$

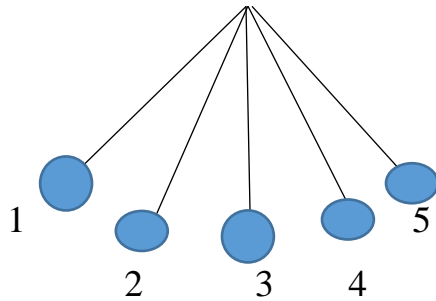
(b) $100 \pi \text{ rads}^{-1}$

(c) $50 \pi \text{ rads}^{-1}$

(d) $400 \pi \text{ rads}^{-1}$

(e) $0.01 \pi \text{ rads}^{-1}$

Use the figure below to answer question 67 and 68



47. The maximum kinetic energy of the simple pendulum occurs when the bob is at position

(a) 1

(b) 2

(c) 3

(d) 4

(e) 5

48. The maximum potential energy of the swinging pendulum occurs at position(s)

(a) 1 and 5

(b) 2 and 4

(c) 3 only

(d) 4 only

(e) 5 and 3

49. The motion of a body is simple harmonic if the:

(a) Acceleration is always directed towards a fixed point

(b) Path of motion is a straight line

(c) Acceleration is always directed towards a fixed point and proportional to its distance from the point

(d) Acceleration is proportional to the square of the distance from a fixed point

(e) Acceleration is constant and directed towards a fixed point

50. Which of the following correctly gives the relationship between linear speed V and angular speed ω of a body moving uniformly in a circle of radius r

(a) $V = \omega r$

(b) $V = \omega^2 r$

(c) $V = \omega r^2$

(d) $V^2 = \omega r$

(e) $V = \frac{\omega}{r}$

ESSAY (Answer any four questions)

1. State two reasons why simple harmonic motion is periodic.
(3marks)
 - b. with the aid of mathematical equation(s) state two factors that affect the period of oscillation of simple pendulum bob
(3marks)
 - c. Sketch a graph of the total mechanical energy, E , against displacement, y , for the motion of a simple pendulum from one extreme position to the other
(4marks)
2. a. Differentiate between specific heat capacity and specific latent heat.
(2marks)
 - b. Calculate the total energy required to evaporate completely 1kg of ice that is initially at -10°C . Given that: [Specific capacity of Ice = $2.2 \times 10^3 \text{ J/kg K}$, Specific heat that capacity of water = $4.2 \times 10^3 \text{ J/kg K}$, Specific latent heat of fusion of Ice = $3.36 \times 10^5 \text{ J/kg}$, Specific latent heat of vaporization = $2.26 \times 10^6 \text{ J/kg}$]
6marks
 - c. Define latent heat of vaporization
2marks
3. Write short note on these:
 - (i) Relative humidity
2marks
 - (ii) Dew point
2marks
 - (b) State Charles law
2marks
 - (c) A vessel is filled with a gas at a temperature 50°C and a pressure of 76cmHg. Calculate the final pressure if the volume of the gas is doubled while it is heated to 90°C
4marks
4. Define the following terms (include the unit) as used in waves
 - i. Period
2marks
 - ii. Wavelength
2marks
 - (b). A plane progressive wave is given by the equation $y = A \sin (0.5x - 2000\pi t)$ Calculate:

- (i) The wavelength of the wave 2marks
 - (ii) The speed 2marks
 - (iii) The frequency 2marks
 - (iv) The period 2mark
5. (a) What is a wave? 2marks
- (b) List and explain any two properties of wave 4marks
- (c) Give four characteristics of image formed by a plane mirror (4marks)
6. (a) What do you understand by the term lateral inversion? (2marks)
- (b) write the name of your physics teacher in block form to buttress (a) (2marks)
- (c) Two plane mirrors inclining at an unknown angle, forms 11 images. Find the value of the angle (4marks)
- (d) Mention two uses of plane mirrors (2marks)