

**CAMEROON COLLEGE OF ARTS, SCIENCE AND TECHNOLOGY
(CCAST) BAMBILI
UPPER SIXTH SCIENCE I & II
TRIAL PHYSICS MULTIPLE CHOICE QUESTIONS.**

December 11, 2004

ADVANCED LEVEL PHYSICS

Subject Title	Physics
Paper No	Paper 1
Subject Code No.	780

One hour forty minutes

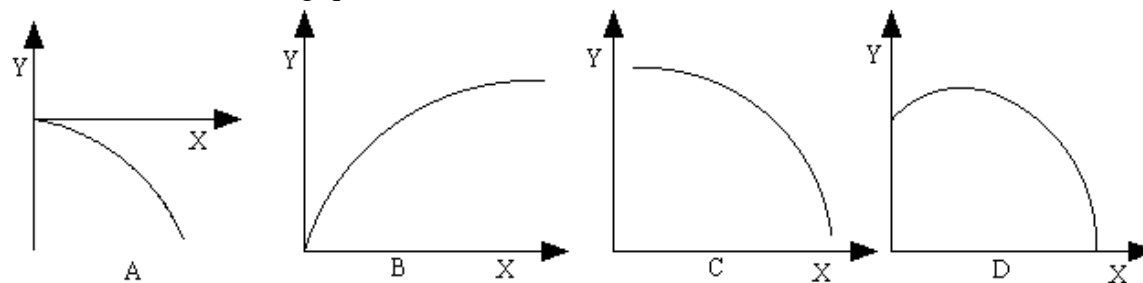
NB: A mark will be subtracted for each wrong answer.

Questions 1-6 (Six questions)

Directions: Each group of questions below consists of four lettered headings followed by a list of numbered questions. For each numbered questions select the one heading which is most clearly related to it. Each heading may be used once, more than once or not at all.

Questions 1-3

Choose from the list A to D below, the graph which best describes the variable Y in relation to X in each of the following questions.



- | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| <p>1. Displacement of a body falling from a cliff</p> <p>2. Charge on capacitor plates during charging</p> <p>3. Surface tension of a liquid</p> | <p>Y</p> <p>X</p> <p>time</p> <p>time</p> <p>Temperature</p> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|

Questions 4 - 6

Choose from the list A to D below the term or phrase which best matches the description in each of the following questions.

The following are four commonly used terms in properties of matter.

- A** Flexible
- B** Tenacity
- C** Resilience
- D** Interstitial atoms

Which of these

4. shows a small stress that produces a large strain
5. shows the ability to stand up to hysteresis
6. is related to the breaking stress of the material?

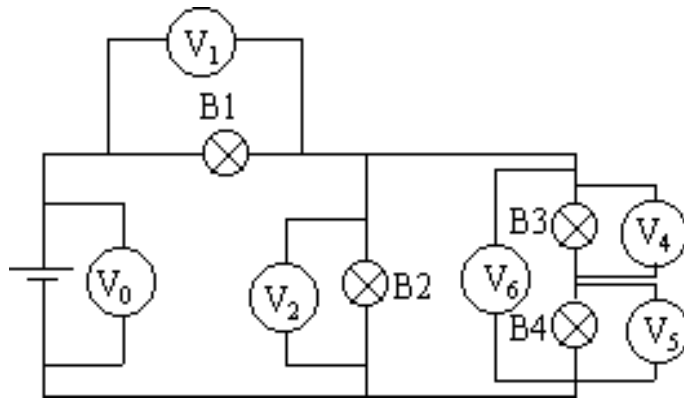
Questions 7-28

(twenty-two questions)

Directions: Each of the questions or incomplete statements in this section is followed by four suggested answers. Select the best answer in each case.

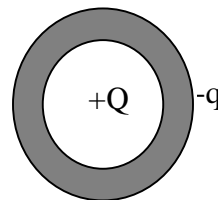
7. A pendulum suspended from the ceiling of a railroad car is observed to hang at an angle of 10° to the right of vertical. Which of the following could explain this phenomenon?
 - A the rail road car is accelerating to the right.
 - B The rail road car is accelerating to the left
 - C the car is moving at uniform velocity
 - D the car is descending a steep slope

8. B1, B2, B3, B4, are identical light bulbs. The voltmeters do not have any effect on the circuit. If B2 were to burn out completely, which voltmeters would read zero volts.
 - A None will read zero.
 - B 1 and 2 will read zero
 - C 1 and 3 will read zero
 - D 3 and 4 will read zero



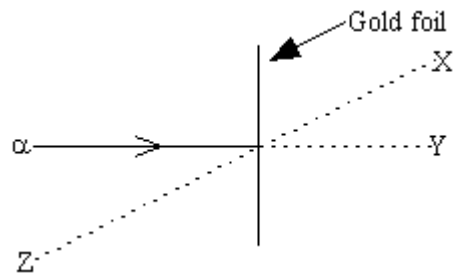
9. A transmission diffraction grating is ruled with 5000 lines per cm. Through what angle will the first order maxima be deflected when light with a wavelength of 4.5×10^{-7} m strikes the grating at an angle of incidence of 0° .
 - A 5.2
 - B 6.4
 - C 13
 - D 12.5

10. A spherical shell with an inner surface radius b, is made of conducting material. A point charge $+Q$ is placed at the centre of the spherical shell and a total charge $-q$ is placed on the shell. Charge distribution on the sphere at equilibrium is



- A $-Q$ on the inner surface, $-q + Q$ on the outer surface.
- B $Q - q$ on the inner surface, $-q + Q$ on the outer surface.
- C $-Q$ on the inner surface, $-q - Q$ on the outer surface.
- D $-Q$ on the inner surface, $+Q$ on the outer surface.

11. In the α -particle scattering experiment below, the ratio of the α -particles detected at the positions X, Y and Z respectively could be



	X	Y	Z
A	3	7	1
B	3	8	0
C	1	7	3
D	2	2	7

12. A particle with positive charge q and mass m travels along a path perpendicular to a magnetic field. The particle describes a circle of radius R with frequency f . What is the magnitude of the B -field

- A $2\pi fm/Q$
- B $2\pi fQ/m$
- C $\pi fQ/2m$
- D $fm/2\pi Q$

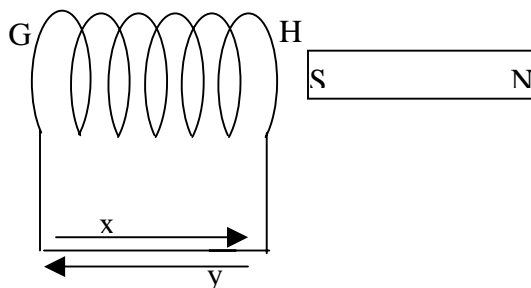
13. When a capillary tube is immersed in water, the water rises in the tube because

- A The pressure on the air side is higher than that on the water side
- B The pressure on the water side is higher than that on the air side
- C The surface of the water curves upward
- D The hydrostatic pressure, $h\rho g$, has to increase.

14. The wave nature of light is demonstrated by

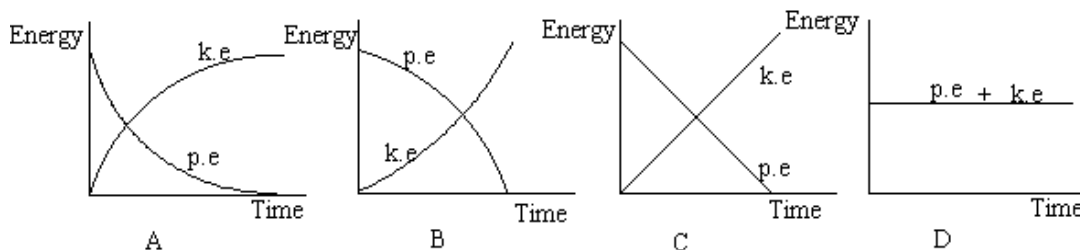
- A photoelectric effect
- B colour
- C the speed of light
- D diffraction

15. A bar magnet is thrust into a coil of wire as indicated in the diagram. Which of the following statements, concerning this experiment is correct.



- A the polarity of coil at H is south, at G is north and the induced current is indicated by arrow y
- B the polarity of coil at H is north, at G is south and the induced current is indicated by arrow y
- C the polarity of coil at H is north, at G is south and the induced current is indicated by arrow x
- D the polarity of coil at H is south, at G is north and the induced current is indicated by arrow x.

16. Which of the following graphs show the relationship between energy and time for a body falling from rest from a height, h , above the earth's surface ?



17. The table shows the speeds of some particles.

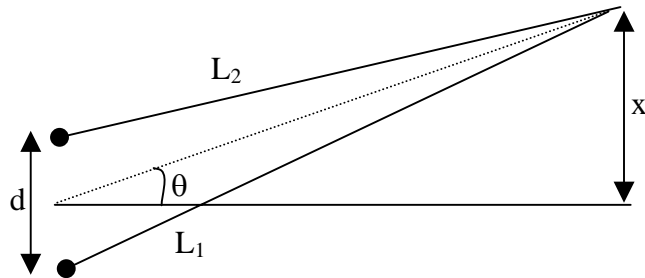
Speed/ m s^{-1}	5	10	20
No. of particles	3	6	4

The root mean square speed of the molecules in m s^{-1} is

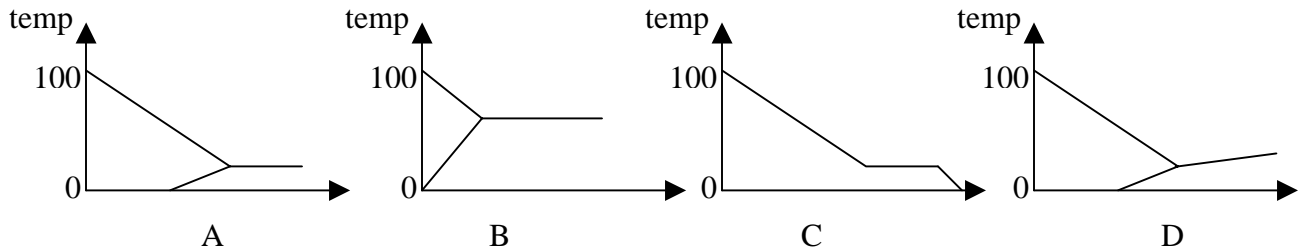
- A $2275/13$
 - B $(525/13)$
 - C $(525/13)^{1/2}$
 - D $(2275/13)^{1/2}$
18. Which one of the following is NOT true about the tuning circuit of a radio receiver?
- A It is possible to have a parallel inductor –capacitor tuning circuit
 - B Resonance for the parallel L –C circuit occurs when the impedance of the circuit is infinite assuming the ohmic resistance of the circuit is negligible
 - C For the series L – C –R circuit, current flow is maximum at resonance but the impedance is greater than R.
 - D Resonance is sharp when the value of R is very small and this reduces interference effects.
19. The dimensions of capacitance of a capacitor is
- A $[\text{M}]^{-1}[\text{L}]^{-2}[\text{T}]^2$
 - B $[\text{Q}]^{-1}[\text{M}][\text{L}]^2[\text{T}]^{-2}$
 - C $[\text{C}]^2[\text{M}]^{-1}[\text{L}]^{-2}[\text{T}]^2$
 - D $[\text{Q}]^2[\text{M}]^{-1}[\text{L}]^{-2}[\text{T}]^2$
20. When a microammeter with resistance 1000Ω reading up to $100 \mu\text{A}$ is to be converted to an ammeter reading up to 1.0 A , the value of the effective resistance is
- A less than 0.1Ω
 - B 0.1Ω
 - C 1.0Ω
 - D 0.01Ω

21. A circuit contains a battery of emf E , a switch, a resistor, R , and an inductor of inductance L .
Which of the following statements is incorrect?
- A When the switch is closed, an induced emf initially acts in the same direction as the battery emf.
 - B The initial rate of rise of current is E/L
 - C The maximum current is ER^{-1}
 - D Opening the switch can cause a spark to jump across the switch gap

22. Two sources, in phase and at a distance d apart, each emit a wave of wavelength λ .
Which of the choices for the path difference δL is identical to $L_1 - L_2$ will always produce destructive interference at point P?



- A $d \sin \theta$
 - B x/L_1
 - C x/L_2
 - D $\lambda/2$
23. If 20 g of ice at 0°C is mixed with 200 g of boiling water at 100°C , which of the following graphs would best represent the temperature versus time of the two components of the mixture?



24. Cathode rays are considered as electrons because
- A of the nature of their deflection in both magnetic and electric fields.
 - B their speed is less than that of light.
 - C of their specific charge value.
 - D electrons are emitted from hot cathodes.
25. A bird resting on a high tension line does not get electrocuted because,
- A current does not kill a bird.
 - B its legs are close together.
 - C current does not go through it.
 - D there is negligible potential difference between its legs.