

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS X

ANNUAL EXAMINATIONS (THEORY) 2024

Physics Paper I

Time: 1 hour 10 minutes Marks: 40

INSTRUCTIONS

1. Read each question carefully.
2. Answer the questions on the separate answer sheet provided. DO NOT write your answers on the question paper.
3. There are 100 answer numbers on the answer sheet. Use answer numbers 1 to 40 only.
4. In each question there are four choices A, B, C, D. Choose ONE. On the answer grid black out the circle for your choice with a pencil as shown below.

Correct Way		Incorrect Ways	
1		1	
		2	
		3	
		4	

Candidate's Signature

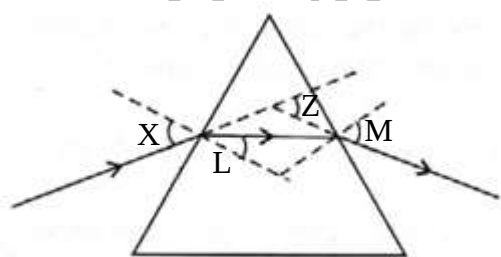
5. If you want to change your answer, ERASE the first answer completely with a rubber, before blacking out a new circle.
6. DO NOT write anything in the answer grid. The computer only records what is in the circles.
7. You may use a simple calculator if you wish.

1. If the length of the inextensible string of a simple pendulum is 0.5 m, then the time period of a simple pendulum is

(**Note:** Take the value of acceleration due to gravity as 9.8 m/s^2 .)

- A. 0.320 s.
 - B. 0.709 s.
 - C. 1.419 s.
 - D. 2.838 s.
2. Suppose if the bob of a simple pendulum is replaced with the planet Earth, then the time period of the pendulum will
- A. increase.
 - B. decrease.
 - C. remain the same.
 - D. vary unpredictably.
3. If the velocity of a sound wave is 340 m/s and its frequency is 200 Hz, then the wavelength of this sound wave will be
- A. 0.6 m.
 - B. 1.7 m.
 - C. 140 m.
 - D. 540 m.
4. One end of a horizontal inelastic string is oscillating vertically while the other end is attached to a fixed object. The wave that will travel along the string will be a/ an
- A. radio-waves.
 - B. transverse wave.
 - C. longitudinal wave.
 - D. electromagnetic waves.
5. The example(s) of transverse wave is/ are
- I. light waves
 - II. radio-waves
 - III. sound waves
- A. II only.
 - B. III only.
 - C. I and II.
 - D. I and III.
6. Two sounds of the same loudness and pitch can be distinguished by the
- A. audible range.
 - B. quality of sound.
 - C. amplitude of sound.
 - D. frequency of sound.

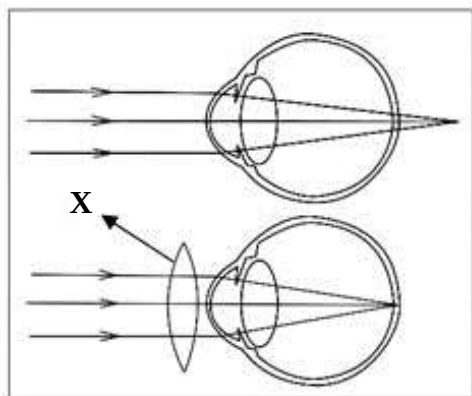
7. A sound wave is a mechanical wave. This means that
- A. sound wave transports energy through vacuum.
 - B. particles of the medium move with the speed of light.
 - C. a medium is required for sound wave to transport energy.
 - D. particles of the medium move perpendicular to the direction of motion.
8. Acoustic protection is an important technique that is used in propagating sound waves to
- A. reduce the quality of sound.
 - B. absorb the undesirable sound.
 - C. enhance the intensity of sound.
 - D. increase the loudness of sound.
9. If an object is placed at the principal focus (F) of a converging lens, then the image will be formed at the
- A. infinity.
 - B. principal focus.
 - C. pole of the lens.
 - D. centre of curvature (2F).
10. A convex lens has a focal length of 10 cm. If the distance between the object and the principal focus is 20 cm, then the image will be formed at a distance of
- A. 5 cm.
 - B. 10 cm.
 - C. 20 cm.
 - D. 40 cm.
11. The path of a ray of light passing through a glass prism is shown below.



The CORRECT representation of the angle of deviation in the given diagram is

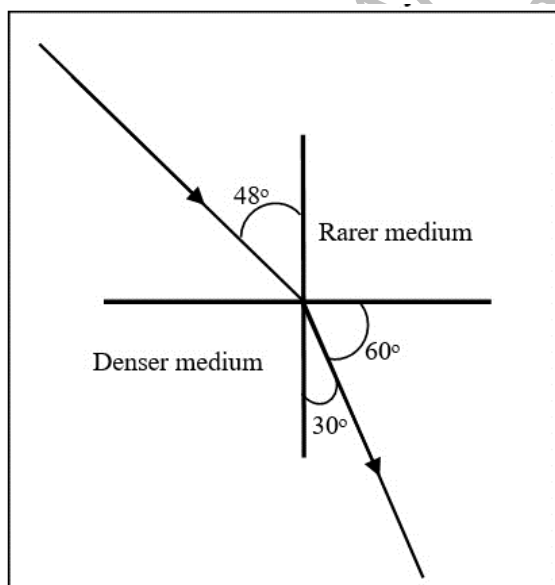
- A. X
- B. Z
- C. M
- D. L

12. In the given ray diagram, a defect and its correction in a human eye is shown.



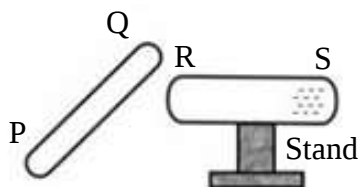
The optical media X used to correct this defect is a

- A. convex lens.
 - B. concave lens.
 - C. convex mirror.
 - D. concave mirror.
13. In the given diagram, the refractive index of the denser medium with respect to the rarer medium can be calculated by



- A. $\frac{\sin 48^\circ}{\sin 30^\circ}$
- B. $\frac{\sin 30^\circ}{\sin 48^\circ}$
- C. $\frac{\sin 48^\circ}{\sin 60^\circ}$
- D. $\frac{\sin 60^\circ}{\sin 48^\circ}$

14. If two capacitors of $8\ \mu\text{F}$ each is connected in parallel with one another, then their effective capacitance will be
- $0.12\ \mu\text{F}$.
 - $0.25\ \mu\text{F}$.
 - $8\ \mu\text{F}$.
 - $16\ \mu\text{F}$.
15. A charged body PQ and a metallic body RS attract each other, when they are brought closer.



If side S is negatively charged, then the charges on the PQ and the side R would be

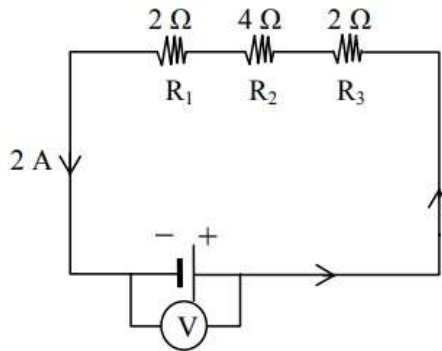
	Charge on PQ	Charge on side R
A	Negative	Positive
B	Negative	Negative
C	Positive	Positive
D	Positive	Negative

16. According to Coulomb's law when two opposite charges come closer to each other, the directions of line of action of forces are
- -
 -
 -
17. The force per unit charge is known as
- electric flux.
 - electric current.
 - electric potential.
 - electric field intensity.
18. The quantity that remains the same in parallel combination of resistance is
- voltage.
 - conductance.
 - electric power.
 - electric current.

19. A 12 V battery, a $12\ \Omega$ resistor and a $4\ \Omega$ resistor are connected in the series combination. The combined resistance of the circuit will be

A. $0.3\ \Omega$.
B. $3.0\ \Omega$.
C. $8.0\ \Omega$.
D. $16\ \Omega$.

20. For the given circuit diagram, the voltmeter reading will be

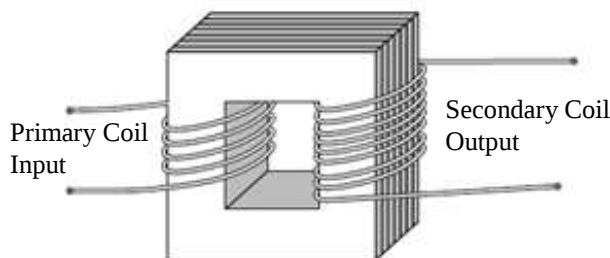


A. 4 volts.
B. 8 volts.
C. 12 volts.
D. 16 volts.

21. If current of 20 A flows through the live wire, then the current in the neutral wire will be

A. 0 A.
B. 10 A.
C. 20 A.
D. 40 A.

22. Which of the following statements is CORRECT about the given transformer?

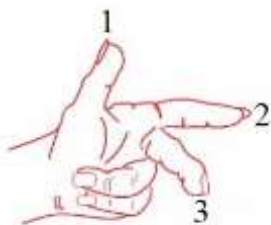


A. It is a step-down transformer.
B. It will increase the resistance.
C. The input current is less than the output current.
D. The input voltage is less than the output voltage.

23. The magnitude of an induced electromotive force is NOT affected by the

- A. resistance in the coil.
- B. number of turns in the coil.
- C. amount of current passing through the coil.
- D. speed of relative motion between the coil and the magnet.

24. Which of the following combinations is a CORRECT representation of Fleming's left-hand rule?



	1	2	3
A	Field	Force	Current
B	Current	Force	Field
C	Force	Field	Current
D	Force	Current	Field

25. An electric motor converts one form of energy to another.

The conversions of energy applicable to the above statement is

- A. electrical to solar.
- B. electrical to chemical.
- C. electrical to mechanical.
- D. electrical to geo-thermal.

26. If the current through a coil of an electromagnet reverses, then the

- A. magnetic field increases.
- B. magnetic field decreases.
- C. direction of the magnetic field reverses.
- D. direction of the magnetic field remains the same.

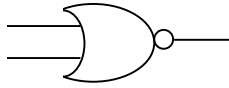
27. When a filament is heated in thermionic emission, a beam of tiny particles is emitted.

These particles are known as

- A. protons.
- B. neutrons.
- C. electrons.
- D. alpha particles.

PLEASE TURN OVER THE PAGE

28. The name of the given logic gate is



- A. OR
- B. NOR
- C. NOT
- D. NAND

29. When a NAND gate combines with a NOT gate, it becomes a/ an

- A. OR gate.
- B. NOT gate.
- C. NOR gate.
- D. AND gate.

30. In electronics, the quantity that maintains a constant rate of change in a particular span of time is known as

- A. binary.
- B. digital.
- C. discrete.
- D. analogue.

31. The logic gate that belongs to the given truth table is

Input A	Input B	Output
0	0	0
0	1	0
1	0	0
1	1	1

- A. OR.
- B. AND.
- C. NOT.
- D. NOR.

32. The tangible components of information technology are
- I. application software
 - II. system software
 - III. scanner
 - IV. printer
- A. I and II.
 - B. I and III.
 - C. II and IV.
 - D. III and IV.
33. Which of the following statements is/ are TRUE about the computer memory?
- I. Secondary memory is a volatile memory.
 - II. Read only memory (ROM) is a volatile memory.
 - III. Random access memory (RAM) is a volatile memory.
- A. I only
 - B. III only
 - C. I and II
 - D. II and III
34. A part of computer system that translates instructions and performs arithmetic calculations is
- A. router.
 - B. modem.
 - C. memory unit.
 - D. central processing unit.
35. The MAIN use of word processing is
- A. typing.
 - B. monitoring.
 - C. controlling.
 - D. data managing.
36. Which of the following nuclear emission leaves both atomic number and atomic mass unchanged?
- I. Alpha particles
 - II. Beta particles
 - III. Gamma rays
- A. I only
 - B. III only
 - C. I and II
 - D. II and III

37. During alpha decay which parts of the atom decrease in number?
- I. Protons
 - II. Neutrons
 - III. Electrons
- A. II only
 - B. III only
 - C. I and II
 - D. I and III
38. If a radioactive substance reduces to $1/16$ of its original mass in 20 days, then its half-life is
- A. 3 days.
 - B. 5 days.
 - C. 16 days.
 - D. 20 days.
39. Alpha particles are highly ionised due to their greater
- A. energy and high speed.
 - B. density and low speed.
 - C. charge and low speed.
 - D. mass and high speed.
40. All the radioactive substances MUST be handled carefully at nuclear power plants because they produce
- A. high voltage.
 - B. greenhouse emission.
 - C. high amount of current.
 - D. rays which damage living cells.

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