AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS X

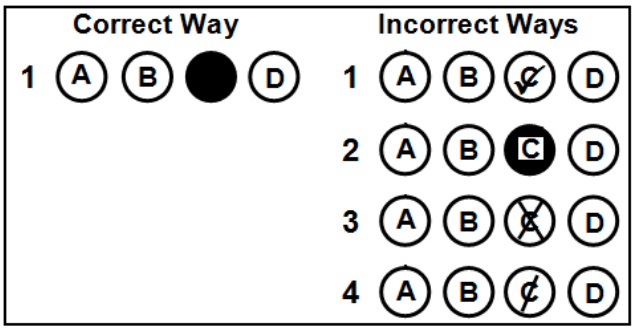
MODEL EXAMINATION PAPER 2023 AND ONWARDS

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.



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 particles of a medium vibrate in the direction of propagation of the wave, then it is called a/ an

   A. surface wave.
   B. transverse wave.
   C. longitudinal wave.
   D. electromagnetic wave.

2. If the frequency of a wave is doubled, then the time period of the wave will

   A. become double.
   B. decrease to half.
   C. remain the same.
   D. decrease to a quarter.

3. If the time period of a simple pendulum is 2 s on the surface of the Earth, then the time period of the same pendulum on the surface of the Moon will be

   A. greater than 2 s.
   B. equal to 2 s.
   C. less than 2 s.
   D. equal to 0 s.

4. If a mechanical wave moves from a rare to the denser medium, then which of the following factors will change during refraction?

   I. Wavelength
   II. Speed of the wave
   III. Frequency of the wave

   A. I only
   B. III only
   C. I and II
   D. II and III

5. The sound energy passes per second through a unit area held perpendicular to the direction of propagation of sound waves.

   The characteristics of the sound identified from the given statement is its

   A. pitch.
   B. quality.
   C. intensity.
   D. loudness.

6. When sound is incident on the surface of a medium, it bounces back into the first medium. This phenomenon is called

   A. an echo.
   B. the acoustic.
   C. the loudness of sound.
   D. the amplitude of sound.

7. Which of the following characteristics of a musical sound depends upon the frequency?

   A. Pitch
   B. Quality
   C. Loudness
   D. Amplitude

8. Four vibrating objects X_1, X_2, X_3 and X_4 are producing sounds. The object that produces the loudest sound is

	Vibrating Objects	Area of Objects	Amplitude of Vibration
A	X_1	5 m^2	4 cm
B	X_2	6 m^2	4 cm
C	X_3	10 m^2	1 cm
D	X_4	10 m^2	5 cm

9. All of the following are the uses of a compound microscope EXCEPT it

   A. is used for observing microorganisms.
   B. helps human beings in the field of medical testing.
   C. helps to find the heavenly bodies in the outer space.
   D. is used in forensics to examine evidences collected from a crime scene.

10. An object is placed between the principal focus (F) and the centre of curvature (2F).

    An image will be formed on the other side of the convex lens

    A. at F.
    B. at 2F.
    C. beyond 2F.
    D. between F and 2F.

11. If an image is formed at a distance of 32 cm from a concave mirror with focal length of 12 cm, then the object's distance is

    A. – 0.052 cm.
    B. – 19.2 cm.
    C. 20.0 cm.
    D. 32.0 cm.

12. The floor of a filled water tank appears at a depth of 3 m. If the refractive index of water is 1.33, then the actual depth of the water is

    A. 0.44 m.
    B. 1.67 m.
    C. 2.25 m.
    D. 3.99 m.

13. Which of the following statements is TRUE about the image formed by a convex mirror?

A. It is real.
B. It is inverted.
C. It is smaller than the object.
D. It is always formed at the principal focus.

14. Two capacitors of capacitance 6 µF and 3 µF are connected in a series across a cell of 18 V.

The equivalent (effective) capacitance will be

A. 2 µF.
B. 3 µF.
C. 6 µF.
D. 9 µF.

15. All of the following are the precautions which should be taken during installation of any electrical equipment EXCEPT

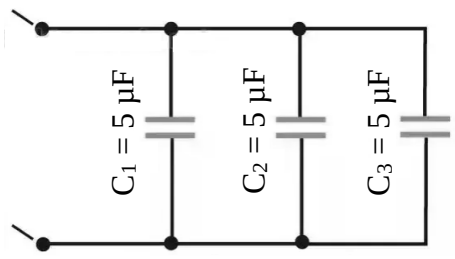
A. turn off any attached peripherals.
B. wear shoes with non-conductive rubber soles.
C. attach the electrical equipment to the AC power.
D. disconnect any telecommunication lines from the system.

16. The electric force of repulsion between two electrons at a distance of 1 m is

(**Note**: The value of the constant of proportionality is 9×10^9 Nm^2/C^2 and the charge on electron is 1.6×10^{-19} C.)

A. 1.29×10^{-1} N.
B. 1.44×10^{-9} N.
C. 2.30×10^{-28} N.
D. 2.30×10^{-30} N.

17. The equivalent capacitance of the given combination of the capacitors will be



A. 0.067 µF.
B. 0.6 µF.
C. 5 µF.
D. 15 µF.

18. All electrical appliances are connected in parallel to each other between the live and neutral wires.

In light of the given statement, which of the following options is TRUE for electric current and potential difference?

	Electric Current	**Potential Difference**
A	Remains the same	Remains the same
B	Remains the same	Varies
C	Varies	Remains the same
D	Varies	Varies

19. If the length and diametre of a solid cylindrical shape conductor is doubled, then the resistance will

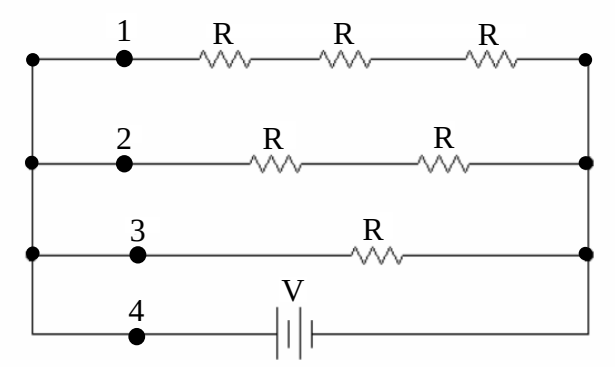
A. reduce to half.
B. reduce to quarter.
C. increase two times.
D. increase four times.

20. Consider two metallic conductors **A** and **B**. Suppose, the length of a metallic conductor **A** is increased and the cross-sectional area of the metallic conductor **B** is also increased.

With reference to the given situations, the resistance of the conductors

Resistance of the		
	Conductor A	**Conductor B**
A	increases	increases
B	increases	decreases
C	decreases	increases
D	decreases	decreases

21. Which of the following points (1 to 4) in the given circuit will receive the lowest magnitude of current?



A. 1
B. 2
C. 3
D. 4

22. The purpose of using a transformer in an electric circuit is to

A. alter the electrical power.
B. adjust the electrical energy.
C. fluctuate the magnetic field.
D. change the voltage or current.

23. The direction of force on a current carrying conductor placed in a magnetic field can be determined by

A. Joule's law.
B. Coulomb's law.
C. Head to tail rule.
D. Fleming's left-hand rule.

24. If a conductor passes through a magnetic field twice with different speeds, then which of the following option is CORRECT with respect to speed and induced electromotive force (e.m.f.)?

	Speed	**Induced Electromotive Force**
A	High	Increased
B	Low	Unchanged
C	Low	Increased
D	High	Decreased

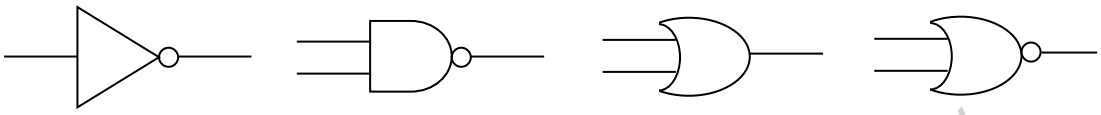
25. If the current through a coil of an electromagnet reverses, then the

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

26. Electromagnets are commonly used in all of the following electrical instruments EXCEPT

A. irons.
B. motors.
C. toasters.
D. generators.

27. Which of the following symbolises of a NAND gate?



A B C D

28. Cathode Rays Oscilloscope (CRO) is NOT used

A. as a voltmeter.
B. to measure alternating and direct currents.
C. to measure the effects of background radiation.
D. to study the effects of electric field on moving charges.

29. All of the following are the fundamental gates EXCEPT

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

30. In thermionic emission, a beam of tiny particles is emitted upon heating the filament. These particles are known as

A. protons.
B. electrons.
C. beta particles.
D. alpha particles.

31. In electronics, the characteristics of an analogue quantity is that it

A. can be represented by discrete levels.
B. randomly selects the sets of quantities.
C. has a continuous set of values over a given range.
D. can be described with a finite number of mathematical steps.

32. Nowadays, laptops are light in weight, small in size and consume less power.

All of the following components of information technology (IT) are used to make this possible EXCEPT

A. hard drive.
B. world wide web.
C. read only memory.
D. random access memory.

33. All of the following are the advantages of the internet EXCEPT

A. faster communication.
B. strong computer security.
C. big source of information.
D. quick access to online services.

34. Light is confined within the core of a simple optical fibre by

A. refraction.
B. diffraction.
C. polarisation.
D. total internal reflection.

35. The largest amount of information can be stored in a/ an

A. hard disc.
B. floppy drive.
C. compact disc.
D. audio cassette.

36. According to the Rutherford model, the positive charge in an atom is

A. concentrated at its nucleus.
B. at the circular orbits of the atom.
C. at a certain distance from its nucleus.
D. uniformly spread throughout the atom.

37. Isotopes of an element can be identified by their

I. mass number (A)
II. charge number (Z)
III. neutron number (N)

A. I only.
B. I and II.
C. I and III.
D. II and III.

38. Gamma rays have penetration power that is

A. less than alpha and beta particles.
B. more than alpha and beta particles.
C. less than alpha, but more than beta particles.
D. more than alpha, but less than beta particles.

39. If a radioactive element has a half-life of 60 seconds, then the quantity of the isotope after 120 seconds will be

A. one-half.
B. one-sixth.
C. one-fourth.
D. one-eighth.

40. Nuclear fission reaction can be produced in $_{92}U^{238}$ by the bombardment of

I. fast neutron
II. slow neutron
III. thermal neutron

A. I only.
B. II only.
C. I and III.
D. II and III.

END OF PAPER

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