ZIAUDDIN UNIVERSITY EXAMINATION BOARD

Total Time 3 hours
Total Marks: 100

Class: XI
Time Allowed: 20 minutes
Q1:

MODEL PAPER EXAMINATION 2026
SUBJECT: PHYSICS
SECTION "A"

Marks: 16

Note: Attempt all questions from this section. Each question carries **ONE** mark.

1) Two bodies of masses 1 kg and 2 kg have equal momentum. What is the ratio of their kinetic energies?
    A. 2:1   B. 3:1   C. 1:3   D. 1:1

2) If the wavelength of an electromagnetic wave is about the diameter of a cricket ball, what type of radiation is it?
    A. X-ray   B. Ultraviolet   C. Radio waves   D. Visible light

3) The experimental evidence of the transverse nature of light is:
    A. Diffraction   B. Interference   C. Polarization   D. Dispersion

4) What is the frequency range of signals that can be transmitted using a twisted pair of wires?
    A. 10 MHz to 15 MHz   B. 5 MHz to 10 MHz
    C. 100 Hz to 5 MHz   D. 10 Hz to 100 Hz

5) A weightlifter consumes 500 J of energy to lift a load in 2 seconds. The power consumed is:
    A. 125 watts   B. 500 watts   C. 250 watts   D. 1000 watts

6) One radian is approximately:
    A. 25°   B. 37°   C. 45°   D. 57°

7) The escape velocity of a planet depends on:
    A. The mass of the planet only   B. The radius of the planet only
    C. Both mass and radius of the planet   D. The density of the planet

8) The force between two charges placed in air is F , if air is replaced by a medium of relative permittivity $\in r$ then force is reduced to:
    A. $F \in r$ B. $r F \in$ C. $r F \in$ D. $\in \in r$

9) The work done by centripetal forces is always:
    A. Maximum   B. Minimum   C. Zero   D. None of these

10) A dependent variable is:
    A. Cause   B. Effect   C. Cause and effect   D. Reason

11) Data on a compact disc is stored in the form of:
    A. Analog signal   B. Digital signal   C. Noise   D. Both A and B

12) If the speed of a moving body is halved, its kinetic energy becomes:
    A. One fourth   B. Double   C. Half   D. Four times

13) The product of charge "q" and small separation "d" between two charges of the same magnitude and opposite nature is known as:
    A. Electric dipole   B. Moment arm   C. Electric dipole moment   D. Flux of electric field

14) A simple pendulum performs S.H.M. with a time period T. If its length is doubled, the new time period will be:
    A. 2T   B. 0.5T   C. 2.5T   D. 1.414T

15) Which among the following is a supplementary unit?
    A. Mass   B. Time   C. Solid angle   D. Luminosity

16) If momentum is increased by 20%, the kinetic energy increases by:
    A. 44%   B. 55%   C. 66%   D. 77%

PRACTICAL BASED ASSESSMENT

Marks 16

Note: Attempt all questions. Each question carries **TWO** marks..

17) The total distance covered by a free-falling object in 3 seconds will be:

(**Note:** The acceleration due to gravity 'g' is 10 m/s².)

    A. 15m   B. 30m   C. 45m   D. 60m

18) When two vectors are added, the resultant vector is represented by:

    A. A straight line joining their midpoints   B. The diagonal of the parallelogram formed by the vectors

    C. The difference between their magnitudes   D. A vector perpendicular to both

19) A simple pendulum has a bob made of ice that melts continuously during oscillations. How will the time period of the 2nd oscillation compare to that of the 100th oscillation?

    A. Less   B. More   C. Same   D. Unpredictable

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20) Calculate the wave length of the sound wave, if the frequency and velocity of a sound wave are 40 Hz and 320 m/s respectively.

    A. 8 m   B. 40 m   C. 80 m   D. 12800 m

21) Two sound waves have frequencies of 250 Hz and 300 Hz. The speed of sound is 340 m/s. What is the difference between the wavelengths of the two waves?

    A. 0.23 m   B. 1.1 m   C. 1.4 m   D. 6.8 m

22) A ball is thrown vertically upwards. Air resistance is negligible. Which statement is correct?

    A. By the principle of conservation of energy, the total energy of the ball is constant throughout its motion.
    B. By the principle of conservation of momentum, the momentum of the ball is constant throughout its motion.
    C. The kinetic energy of the ball is greatest at the greatest height attained.
    D. The potential energy of the ball increases at a constant rate during its ascent.

23) A man is running a race in a straight line. What is an approximate value of his kinetic energy?

    A. 10 J   B. 100 J   C. 1000 J   D. 10000 J

24) What correctly expresses the volt in terms of SI base units?

    A. $A\,\Omega$ B. $W\,A^{-1}$ C. $kgm^{2}\,s^{-1}\,A^{-1}$ D. $kgm^{2}\,s^{-3}\,A^{-1}$

END OF SECTION A

Class: XI

MODEL PAPER EXAMINATION 2026

Time: 2 hours 40 minutes

SUBJECT: PHYSICS SECTION "B" AND SECTION "C"

SECTION "B" SHORT ANSWER QUESTIONS

Total Marks 68

36 Marks

Q2:

NOTE: Answer any **NINE**-part question from this section. All question carries equal marks. Draw diagram where necessary.

(i)   Explain the work-energy theorem and derive its mathematical expression.
(ii)   How do factors such as gravity, mass, and amplitude of oscillation affect the period of a simple pendulum? Discuss each factor in detail.
(iii)   If the moment of inertia of a rotating body is reduced by half, what happens to its angular velocity?
(iv)   A canal lock gate is 20 m wide and 10 m deep. Given the water's density as 1000 kg/m³ and gravitational acceleration as 9.8 m/s², calculate the thrust acting on the gate.
(v)   Define core and cladding in optical fibers. On what principle does optical fiber communication work?
(vi)   An electron moves with a speed of 10^6 m/s. Calculate its energy in electron volts (eV).
(vii) In a Michelson interferometer, if 92 bright fringes appear on the screen as one of the mirrors is moved by 25.8 micrometers, what is the wavelength of light used?
(viii) A 70 kg man runs up a hill with a height of 3 m in 2 seconds:
    a) Calculate the work done against the gravitational field.
    b) Determine the average power output during the activity.
(ix)   Why is the terminal voltage of a cell lower than its emf?
(x)   When a male voice undergoes modulation and transmission, it sounds like a female voice to the receiver. Explain why this happens.
(xi)   For an isolated rotating body, explain the relationship between angular velocity and radius.
(xii) A diffraction pattern is observed from a single slit of width 0.020 mm. The screen is placed 1.20 m away, and the wavelength of light used is 430 nm. What is the width of the central maximum?
(xiii) At what angle does the range of a projectile become equal to its maximum height?
(xiv) List two practical applications of Bernoulli's principle.
(xv) What is resonance frequency? Explain its relationship to the natural frequency of an oscillating system.

SECTION "C" DETAILED ANSWER QUESTIONS   **32 Marks**

Note: Answer any **TWO** questions from this section. All question carries equal marks. Draw diagrams where necessary.

    Your answer should not exceed 30 - 40 lines.

3. a) Explain the concept of the independence between horizontal and vertical motion in projectile motion.
   b) Calculate the combined capacitance of capacitors in series and parallel.

4. a) Discuss the Doppler effect for sound waves. How do the motion of the source and the observer affect the perceived frequency and pitch of the sound?
   b) State the three equations of motion for uniformly accelerated motion and derive them.

5. a) Define Simple Harmonic Motion (SHM). Discuss the key characteristics of a system undergoing SHM.
   b) Explain Archimedes' Principle and how it can be used to determine the purity of gold using density.

END OF PAPER