Time: 2 ½ hours	Max Marks: 80

Important Instructions: This paper consisting of short-Answer Questions (Section 'B') and descriptive-answer question (Section 'C') is being after 30 minutes. Its total duration is 2 ½ hours only.

SECTION "B"

(SHORT-ANSWER QUESTIONS) (Marks: 40)

(PART-A)

Note: Answer any FIVE questions from this section.

2. Write two contributions of each of the following:

i. Yaqoob Al Kindi ii. Al-Beruni

OR

What is Physics? Define branches of physics about solid material, nucleus of atoms and astronomical bodies.

OR

Write three laws of motion.

3. Give scientific reasons:

I. Why is a gap left between two pieces of a railway track?

II. Why in an ammeter, low resistance is connected in parallel with the coil**.**

III. Why does a snail sink in water whereas a ship having a much bigger mass floats on the surface of water.

IV. Why it is difficult to jump from a fast moving vehicle?

4. Write two points of difference between each:

i. Distance and Displacement

ii. Stress and strain

iii. Stable Equilibrium and Unstable Equilibrium

OR

i. Heat and Temperature

ii. Kinetic energy and Potential energy

iii. P-type and N-type substance

5. State the following Laws:

I. Hooke's law

II. Snell's law

III. Boyle's law

OR

i. Ohm's law

ii. Law of conservation of momentum

iii. Law of inertia

6. Define the following:

I. Viscosity **II.** Surface tension **III.** Specific heat **IV.** Electronics

OR

Define the following:

a. Power of lens **b.** Beats **c.** Interference **d.** Dispersion of light.
e. Nuclear Reactor **f.** Half-life of an element

7. What is a P-N Junction? How it connects to a battery to get maximum and minimum current?

OR

Define rectification. Describe the working of a semiconductor diode as a rectifier.

OR

What is an electromagnet? Illustrate it with a labelled diagram and write down its three uses.

OR

Write any four properties of Alpha rays

8. Define Elastic Potential Energy and derive the equation of Elastic Potential energy = ½ Kx^2

OR

Define Frequency and Time period. Derive the expression of wave velocity.

OR

Define evaporation and write down four factors on which the rate of evaporation depends.

OR

What is Power? Prove that product of mass and velocity is equal to power.

9. Describe any four Electromagnetic Waves with their ranges.

OR

State Pascal's principle and write its four uses in daily life.

OR

With the help of trigonometric ratios. Find the magnitude of horizontal and vertical component of a vector.

(PART-B)

Note: Answer any FIVE questions from this section.

10. Find the distance between the Mars and Sun. the light reaches Mars in 13 min 6 seconds.

OR

A Car is moving on a straight road with a velocity of 72 km/hr. when the brakes are applied the car comes to rest after covering a distance of 10 cm. Calculate the acceleration.

11. A force of 100N acts on a block by making an angle of 30^0 with the horizontal surface. Find the Horizontal and Vertical component of the force.

OR

A ball is dropped from a tower; it reaches the ground in 10 seconds. Calculate the height of the tower? (Take g =10m/s^2)

12. The mass of proton is 1.67X10^{-27} Kg, convert it into:
i) Gram ii) milligram iii) centigram iv) microgram

13. Calculate the Orbital velocity of satellite required moving around the earth where radius of Earth is 6 X 10^6 m and value of g is 10 m/s^2?

OR

A 5 m long beam pivoted into a wall a force of 10N is applied vertically at the far end of beam. Find the torque produced.

14. What is the Kinetic Energy of a 2000Kg car which is travelling with a velocity of 36 km/hr?

OR

What is the pressure of 200 moles of a gas in a 100dm^3cylinder at 20^0C?

15. 600 waves pass through a point on the surface of pond in one minute. The distance between two consecutive crests is 35cm. find the velocity of the waves.

OR

How much amount of heat is required to raise the temperature of 100g of water from 20^0Cto 80^{-0}C?
(Specific heat of water is 4200 J/Kg.^{0}C)

16. Find the resistance of a bulb, if 0.6A current is passing through the bulb and the potential difference across the bulb is 90 volts.

OR

Find Energy in Kilo Watt Hours, if the power is 200W bulb used in 30 min?

17. An object is placed in front of a concave mirror of focal length 4cm if the image is 4cm high. Find the height of the object.

OR

An object is placed 20 cm from a convex lens of the focal length of 30cm. find the position and magnification of the image.

SECTION "C"

(DESCRIPTIVE-ANSWER QUESTIONS)

(Marks: 26)

Note: Answer any TWO questions from this section.

18. a) Derive the relation S = Vit + ½ at^2

OR

Derive an expression how the value of 'g' decreases with a change in altitude.

b) State Pascal's law and explain the working of hydraulic lift with the help of diagram

OR

With the help of labeled diagram explain the construction and working of an Electric Bell.

OR

Derive Gas equation

19. a) With the help of ray diagram derive the mirror equation $\frac{1}{f} = \frac{1}{p} + \frac{1}{q}$

OR

Define coefficient of Linear and Volumetric Expansion. Also prove that $\beta = 3\alpha$

OR

Define the capacity of a Capacitor. Write down three factors upon which capacity of capacitor depends and derive q = Cv

b) Draw a ray diagram of Astronomical telescope / Compound microscope and also describe it's working.

20. a) define Simple harmonic motion and prove that the motion of a body attached to the end of spring is executed harmonic motion.

OR

Two bodies of unequal masses are attached with a string of both ends and passes over a frictionless pulley. Derive an expression for its acceleration and tension produce in the string.

b) What is Wheel and Axle with the help of labeled diagram, calculate its mechanical advantages.

OR

What is the fission reaction? Explain chain reaction with the help of diagram also write its equation.

OR

Write two advantages and disadvantages of Friction and write the methods to reduce the friction.

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