BLOW UP SYLLABUS
I PUC PHYSICS - 33
(THEORY)

UNIT-I

Chapter 1: PHYSICAL WORLD (2 hours)

Physics: Scope and excitement of physics - Physics, technology and society - Mention of fundamental forces in nature - Nature of physical laws.

Chapter 2: UNITS AND MEASUREMENTS (4 hours)

Unitof measurement - System of units - SI units - Fundamental and derived units - Length, mass and time measurements - Accuracy and precision of measuring instruments.

Errors in measurement: Significant figures,

Dimensions of physical quantities - Dimensional analysis and its applications: (a) Checking of dimensionalconsistency of equations and (b) Deducing relation among physical quantities, Numerical Problems.

UNIT-II

Chapter 3: MOTION IN A STRAIGHT LINE (8 hours)

Position and frame of reference - Definitions of path length and displacement - Definitions of average speed and average velocity, instantaneous speed and instantaneous velocity& uniform and non-uniform motion - Uniformly accelerated motion.

Position-time graph - Velocity-time graph: to show that area under the velocity time curve is equal to displacement.

Kinematic equations for uniformly accelerated motion: Derivation of $v = v_o + at$,$x = v_o t + ½ at^2$ and $v^2 = v_o^2 + 2 a x$using$v$-t graph - Relative velocity.

Elementaryconceptsof differentiationand integration for describing motion, Numerical Problems.

Chapter 4: MOTION IN A PLANE (12 hours)

Scalars and vectors – Positionand displacement vectors - Equality of vectors - Multiplication of a vector by real number.

Addition and subtraction of two vectors: Triangle method and parallelogram method.Unit vector - Resolution of a vector: Rectangular components. Resultant of two concurrent vectors, *(Refer example 4.2 of text book)*.

Scalar and vector products of two vectors with examples (*Refer Chapter 6 & 7 of text book)*.

Motion in a plane with constant acceleration.

Projectile motion: Derivations of equation of path, time of flight, maximum height and horizontal range, of a projectile.

Uniform circular motion: Derivation of centripetal acceleration, Numerical Problems.

UNIT-III

Chapter 5: LAWS OF MOTION (11 hours)

Aristotle's fallacy - Newton's first law of motion: Concept of inertia and force – Concept of momentum - Newton's secondlaw of motion: Derivation of $\vec{F} = m\,\vec{a}$anddefinition of SI unit of force - Impulse, impulsive force and examples - Newton's third law of motion: Identification of action and reaction pairs with examples in everyday life.

Law of conservation of linear momentum: Statement and proof in the case of collision of two bodies. Condition for equilibrium of a particle under the action of concurrent forces,

Friction: Static and kinetic friction - Laws of friction - Rolling friction - Methods of reducing of friction.

Dynamics of uniform circular motion: Derivation of maximum speed of a carmoving on banked circular road and discuss in the case of level circular road, Numerical Problems.

UNIT-IV

Chapter 6: WORK, ENERGY AND POWER (11 hours)

Work: Definition of Work – $W = \vec{F} \,.\, \vec{d}$ and discussion of various cases - Work done by a constant force and a variable force.

Kinetic energy - Work-energy theorem: Statement and proof in the case of rectilinear motion under constant acceleration.

Concept of potential energy - Principle of conservation of mechanical energy: Statement and illustration in the case of freely falling body.

Conservative and non-conservative forces with examples.

Potential energy of a spring - Mention of expression $V(x) = ½\, kx^2$.

Power: Definition and derivation ofpower $p = \vec{F} \,.\, \vec{v}$.

Collisions: Elastic and inelastic collisions - Collisions in one dimension: Derivation of loss of kinetic energy in completely inelastic collisions -Derivation of final velocity of masses undergoing elastic collision - Collisions in two dimensions, Numerical Problems.

UNIT-V

Chapter 7: SYSTEMS OF PARTICLES AND ROTATIONAL MOTION (12 hours)

Definitions of a rigid body, translatory motion and rotatory motion - Centre of mass of a two-particle system - Mention of expression for position coordinates of centre of mass of (a) n particle system (b) a rigid body and (c) a uniform thin rod.

Definition of angular velocity and mention of the relation $v = r\omega$ - Definitions of angular acceleration and moment of a force – torque - Angular momentum of a particle: Derivation of $\frac{d\vec{l}}{dt} = \tau$.
Equilibrium of rigid body: Mention of conditions for mechanical equilibrium of a rigid body.
Definitions of moment of inertia and radius of gyration -Theorems of parallel and perpendicular axes: Statement and explanation - Mention of expressions for moment of inertia of a simple geometrical objects.
Kinematics of rotational motion about a fixedaxis: Mention of equation of rotational motion - Comparison of linear and rotational motion.
Principle of conservation of angular momentum: Statement and illustrations, Numerical Problems.

UNIT-VI

Chapter 8: GRAVITATION (9 hours)
Kepler's laws of planetary motion: Statement and explanation - Universal law of gravitation: Statement and explanation.
Acceleration due to gravity: Derivation of relation between g and G.
Variation of acceleration due to gravity with altitude (height) and depth: Derivation of acceleration due gravity ata point (a) above and (b) below, the surface of earth.
Gravitational potential energy: Derivation of gravitational potential energy.
Escapespeed: Definition and derivation of expression for escape speed from the principle of conservation of energy.
Earth satellites: Derivation of orbital speed of earth satellite - Geostationary and polar satellites, Numerical Problems.

UNIT-VII

Chapter 9:MECHANICAL PROPERTIES OF SOLIDS (5 hours)
Elasticity and plasticity -Elastic behavior of solids -Stress and strain - Hooke's law - Stress-strain curve - Elastic moduli: Definitions and expressions of Young's modulus, Bulk modulus and Shear modulus of rigidity.
Refer supplementary material of text book:Poisson's ratio - Elastic energy, Numerical Problems.

Chapter 10: MECHANICAL PROPERTIES OF FLUIDS (5 hours)
Pressure: Definition - Derivation of pressure at a point inside a liquid - Gauge pressure. Pascal's law: Statement and its applications (hydraulic lift and hydraulic brakes).
Streamline flow: Equation of continuity - Turbulent flow –Criticalspeed.
Bernoulli's principle: Statement - Explanation of Bernoulli's equation - Illustration ofBernoulli's principle in the case of (a) blood flow and heart attack (b) dynamic lift of a ball and aerofoil.

Viscosity: Definition and mention of expression for coefficient of viscosity.Stokes' law.
Reynolds number: Mention of expression - Classification of nature of flow on the basis of Reynolds number.
Surface tension: Surface energy and surface tension - Angle of contact - Applications of surface tension ideas todrops, bubbles, capillary rise and action of detergents, Numerical Problems.

Chapter11: THERMAL PROPERTIES OF MATTER (10 hours)

Temperature and heat - Thermal expansion of solids: linear, area and volume expansion of solids - Thermal expansion of liquids: Anomalous expansion of water - Thermal expansion of gases: Derivation of $\alpha_V = 1/T$ for ideal gas.
Specific heat capacity: Definition of heat capacity and specific heat capacity - Molar specific heat capacity at constant pressure and at constant volume.
Principle of calorimetry - Change of state: melting, fusion, melting point,regelation, boiling point, sublimation point - Latent heat: Latent heat of fusion and vaporisation.
Heat transfer: Conduction and thermal conductivity - Convection: Sea breeze and land breeze - Radiation: Newton's law of cooling.
Refer supplementary material of text book:Stefan's law - Qualitative ideas of black body radiation - Wien's displacement law - Greenhouse effect, Numerical Problems.

UNIT-VIII

Chapter 12: THERMODYNAMICS (8 hours)

Thermal equilibrium – Zerothlaw of Thermodynamics: Statement and explanation. - Heat, internal energy and work - First law of thermodynamics: Statement and explanation -Isothermal process: Derivation of work-done in isothermal process.
Adiabatic process: Mention of the expression PV^{γ} = constant, for adiabatic process.
Heat engines: Schematic representation and efficiency.
Refrigerators (Heat pumps): Schematic diagram and coefficient of performance.
Second law of thermodynamics: Kelvin-Planckstatementand Clausiusstatement - Reversible and irreversible processes.Carnot's engine: Carnot cycle and efficiency, Numerical Problems.

UNIT-IX

Chapter 13:KINETIC THEORY (5 hours)

Equation of state of a perfect gas - Kinetic theory of an ideal gas: Derivation of $P = \frac{1}{3} mn\bar{v}^2$ - Kinetic interpretation of temperature: Mention of expression for average kinetic energy of a molecule in terms of absolute temperature - Definition of rms speed of gas molecules.
Degrees of freedom - Law of equipartition of energy: Statement and applicationto specific heat capacities of monatomic, diatomic and polyatomic gases -Concept of mean free path, Numerical Problems.

UNIT-X

Chapter 14:OSCILLATIONS (8 hours)

Periodic and oscillatory motion: Definitions of Period and Frequency - Displacement as a function of time - Periodic functions.

Simple harmonic motion: Definition, equation, graphical representation of displacement with time – Phase - Mention of expressions for velocity and acceleration- Force law for simple harmonic motion : $F(t) = -kx(t)$ - Energy in simple harmonic motion: Derivations of kinetic energy, potential energy and total energy.

Oscillations due to a spring- Restoring force & force constant -Mention of expression for time period.

Simple pendulum: Derivation of expression for time period - Qualitative ideas of damped, forced and free oscillations –Resonance, Numerical Problems.

Chapter 15:WAVES (10 hours)

Wave motion – Longitudinaland transverse waves - Mention of displacement relation in a progressive wave - Amplitude and phase - Wavelength and angular wavenumber - Period, frequency and angular frequency - Speed of traveling wave: Mention of expression for $v = \upsilon\lambda$ -Mention of expression for speed of transverse wave on a stretched string$v = \sqrt{\frac{T}{\mu}}$.

Speed of a longitudinal wave(sound): Newton's formula and Laplace's correction.Qualitative explanation of principle of superposition of waves.

Reflection of waves at rigid and open boundary.

Standing waves and normal modes: Theory, extension to stretched string and air columns -Fundamental mode and harmonics - Theory of beats.

Doppler effect: Explanation of the phenomenon -Derivation of apparent frequency in the case of (a) moving source and stationary observer, (b) moving observer and stationary source and (c) both source and observer moving, Numerical Problems.

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SYLLABUS
I PUC PHYSICS - 33
(Practical)

Experiments:

1) To measure diameter of a small spherical/cylindrical body using Vernier Callipers.
2) To measure internal diameter and depth of a given beaker/calorimeter using Vernier Callipers and hence find its volume.
3) To measure diameter of a given wire using screw gauge.
4) To measure thickness of a given sheet using screw gauge.
5) To measure volume of an irregular lamina using screw gauge.
6) To determine radius of curvature of a given spherical surface by a spherometer.
7) To determine the masses of two different objects using a beam balance.
8) To find the weight of a given body using parallelogram law of vectors.
9) Using a simple pendulum, plot L-T and L-T^2 graphs. Hence find the effective length of a second'spendulum using appropriate graph.
10) To study the relationship between force of limiting friction and normal reaction and to find the coefficient of friction between a block and a horizontal surface.
11) To find the downward force, along an inclined plane, acting on a roller due to gravitational pull of the earth and study its relationship with the angle of inclination (θ) by plotting graph between force and *sin* θ.
12) To determine Young's modulus of elasticity of the material of a given wire.
13) To find the force constant of a helical spring by plotting a graph between load and extension.
14) To study the variation in volume with pressure for a sample of air at constant temperature by plotting graphs between P and V, and between P and 1/V.
15) To determine the surface tension of water by capillary rise method.
16) To determine the coefficient of viscosity of a given viscous liquid by measuring the terminal velocity of a given spherical body.
17) To study the relationship between the temperature of a hot body and time by plotting a coolingcurve.
18) To determine specific heat capacity of a given (i) solid (ii) liquid, by method of mixtures.
19) (i) To study the relation between frequency and length of a given wire under constant tension using sonometer.
    (ii) To study the relation between the length of a given wire and tension for constant frequency using sonometer.
20) To find the speed of sound in air at room temperature using a resonance tube by two resonance positions.

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Design of Question Paper
I PUC PHYSICS (33)

Time: 3 Hours 15 Minutes (*of which 15 minutes for reading the question Paper*).
Max. Marks: 70

The weightage of the distribution of marks over different dimensions of the question paper shall be as follows:

A. Weightage to Objectives:

Objective	Weightage	Marks
Knowledge	40%	43/105
Understanding	30%	31/105
Application	20%	21/105
Skill	10%	10/105

B. Weightage to content/subject units:

Unit No.	Chapter No.	Topic	No. of Hours	Weightage of marks
I	1	Physical world	2	2
	2	Units and measurement	4	3
II	3	Motion in a straight line	8	7
	4	Motion in a plane	12	11
III	5	Laws of motion	11	10
IV	6	Work energy and power	11	10
V	7	System of particles and rigid body	12	10
VI	8	Gravitation	9	8
VII	9	Mechanical properties of solids	5	4
	10	Mechanical properties of fluids	5	4
	11	Thermal properties of matter	10	9
VIII	12	Thermodynamics	8	7
IX	13	Kinetic theory	5	4
X	14	Oscillations	8	7
	15	Waves	10	9
TOTAL			**120**	**105**

Note: Variation of 1Markper chapter is allowed, however the total marks should not exceed 105.

C. Weightage to forms of Questions:

Part	Question Main	Type of questions	Marks	Number of questions to be set	Number of questions to be answered
A	I	Very short answer(VSA)	1	10	10
B	II	Short answer(SA1)	2	8	5
C	III	Short answer(SA2)	3	8	5
D	IV	Long answer(LA)	5	3	2
	V	Long answer(LA)	5	3	2
	VI	Numerical Problems(NP)	5	5	3

Note:

1. ***L A Questions in IV and V mains should not be split in to SA and VSA type Questions.***
2. ***L A Questions in IV Main must be set from Unit I to V.***
3. ***L A Questions in V Main must be set from Unit VI to X.***
4. ***N P Questions in VI Main must be set such that one Numerical Problem is from every 2 successive units.***

D. Weightage to level of difficulty:

Level	Weightage	Marks
Easy	40%	43/105
Average	40%	42/105
Difficult	20%	20/105

General instructions

- Questions should be clear, unambiguous, understandable and free from grammatical errors.
- Questions which are based on same concept, law, fact etc. and which generate the same answer should not be repeated under different forms (VSA, SA, LA and NP).
- Questions must be set based on the blow up syllabus only.

I P.U.C PHYSICS (33)
Blue print for Model question paper – I

Unit	Chapter	Topic	Teaching Hours	Marks allotted	1 mark (VSA)	2 mark (SA1)	3 mark (SA2)	5 mark (LA)	5 mark (NP)
I	1	Physical world	2	2		✓			
	2	Units and measurement	4	3	✓	✓			
II	3	Motion in a straight line	8	7		✓		✓	
	4	Motion in a plane	12	11	✓	✓	✓		✓
III	5	Laws of motion	11	10		✓	✓	✓	
IV	6	Work energy and power	11	9	✓		✓		✓
V	7	System of particles and rigid body	12	11	✓	✓	✓	✓	
VI	8	Gravitation	9	8			✓		✓
VII	9	Mechanical properties of solids	5	4	✓		✓		
	10	Mechanical properties of fluids	5	4	✓✓	✓			
	11	Thermal properties of matter	10	9	✓		✓		✓
VIII	12	Thermodynamics	8	6	✓			✓	
IX	13	Kinetic theory	5	4	✓		✓		
X	14	Oscillations	8	7		✓		✓	
	15	Waves	10	10				✓	✓
TOTAL			**120**	**105**	**10**	**16**	**24**	**30**	**25**

MODEL QUESTION PAPER-I
I P.U.C PHYSICS (33)

Time: 3 hours 15 min. **Max Marks: 70**

General instructions:

1) *All parts are compulsory.*
2) *Answers without relevant diagram / figure / circuit wherever necessary will not carry any marks.*
3) *Direct answers to the Numerical problems without detailed solutions will not carry any marks.*

PART - A

I Answer the following. **10 × 1 = 10**

1. Mention the method of determining the mass of planets, stars etc.,
2. What is the minimum number of vectors required to give zero resultant?
3. What is the value of One kilowatt hour (kWh) in joules?
4. Define rigid body.
5. State Hooke's law.
6. Write the equation of continuity for the flow of incompressible fluids.
7. Give an importance of Reynolds number.
8. Name the principle used in calorimetry.
9. State Zeroth law of thermodynamics.
10. Write the equation of state of perfect gas.

PART – B

II Answer anyFIVE of the following questions. **5 ×2=10**

11. Name two fundamental forces of nature.
12. Mention two uses of dimensional analysis.
13. A player throws a ball vertically upwards. What is the direction of acceleration during upward motion? What is the velocity at the highest point of its motion.
14. Define the terms: unit vector and equal vectors.
15. Mention two methods of reducing friction.
16. Write the conditions of mechanical equilibrium of a rigid body.
17. Define surface tension. Why there is no surface tension in gases?
18. What is a periodic motion? Give an example.

PART – C

III Answer anyFIVE of the followingquestions. 5 x 3 =15

19. What is centripetal acceleration? Write the expression for the centripetal acceleration and explain the terms.
20. Derive F = ma with usual notations.
21. Obtain the expression for power, $P = \vec{F}.\vec{v}$
22. State and explain the perpendicular axis theorem.
23. Arrive at the expression for escape speed of the body from the surface of earth.
24. Draw a typical stress-strain curve for a metal. Mention yield point and fracture point.
25. Mention three factors on which heat flow by conduction in a bar depends.
26. Define degrees of freedom of a molecule. State and explain law of equipartition of energy.

PART – D

IV Answer any TWO of the followingquestions. 2 x 5 = 10

27. What is v-t graph? Derive $x = V_o t + \frac{1}{2}at^2$ using v-t graph.
28. State the principle of conversation of mechanical energy. Illustrate it in the case of freely falling body.
29. Define angular momentum and Torque. Derive the relation between them.

V Answer any TWO of the followingquestions. 2 x 5 = 10

30. Define latent heat of fusion and latent heat of vaporisation. Explain the variation of temperature with heat (energy) for water at oneatmosphere with a graph.
31. What are beats? Give the theory of beats.
32. What is a Carnot engine? Explain the Carnot cycle with a diagram.

VI Answer anyTHREE of the followingquestions. 3x5=15

33. A cricket ball is thrown at a speed of $56\ ms^{-1}$ in a direction, making an angle 30^o with the horizontal. Calculate
    a) Maximum height,
    b) Total time taken by the ball to return to the earth and
    c) The distance from thrower to the point where the ball returns to the earth.
34. A well 20m deep and 7m in diameter is full of water. Calculate the work done in pumping the whole of water up to ground level.

35. If the mass of the earth is 100 times that of the moon and its diameter 5 times that of moon, compare the weight of a body on the surface of the moon with its weight on the surface of the earth.

36. A thermo coal ice box is a cheap and efficient method for storing small quantities of cooked food in summer in particular. A cubical ice box of side 30 cm has a thickness of 5 cm. If 4.0 kg of ice is put in the box, estimate the amount of ice remaining after 6 hrs. The outside temperature is 45^{o}C and co-efficient of thermal conductivity of thermo coal is 0.01 $Js^{-1} m^{-1} k^{-1}$.

[Heat of fusion of water = $335 \times 10^3 \ \mathrm{J\,kg^{-1}}$]

37. A train standing at the outer signal of a railway station blows a whistle of frequency 400Hz in still air.

(i) What is the frequency of whistle for a platform observer when the train (a) approaches the platform with speed of $10 \ \mathrm{ms^{-1}}$

(b) Recedes from the platform with the speed of $10 \ \mathrm{ms^{-1}}$

(ii) What is the speed of sound in each case?

[The speed of sound in still air = 340 $\mathrm{ms^{-1}}$]

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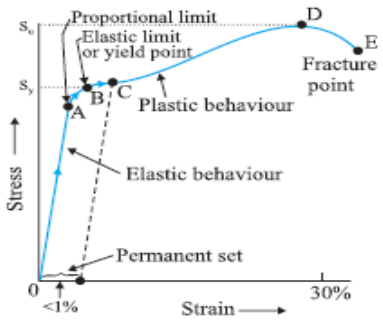
I PU PHYSICS (33)

SCHEME OF EVALUATION OF MODEL QUESTION PAPER-I

Qn. No.		Marks Allotted
I	**PART – A**	
1	Gravitational method	**1**
2	Two	**1**
3	3.6×10^6 J	**1**
4	Definition	**1**
5	For small deformation, the stress and strain are directly proportional to each other	**1**
6	Av = constant, i.e. volume flux or rate flow of incompressible fluids is a constant.	**1**
7	Reynolds number is used to determine the flow of liquid streamline or turbulent.	**1**
8	Heat gained by the hot body = heat lost by the cold body	**1**
9	Two systems in thermal equilibrium with a third system separately are in thermal equilibrium with each other.	**1**
10	PV = RT	**1**
II	**PART – B**	
11	Gravitation force, Electromagnetic force, strong force and weak force. (Any two)	**1+1**
12	To check the correctness of the equation To convert one system of units to other (Any two)	**1** **1**
13	Vertically downwards and zero	**1+1**
14	A vector of unit magnitude is called unit vector. Two vectors of same magnitude and same direction are called equal vectors.	**1** **1**
15	Using lubricants Using ball bearings (any two methods)	**1** **1**
16	Mention of two conditions	**1+1**
17	It is the force/unit length (or surface energy per unit area) acting in the plane of the interface between the plane of the liquid and any other substance. Gases do not have free surfaces, hence no surface tension.	**1** **1**

18	A motion that repeats itself at regular intervals of time is called periodic motion. Oscillations of a simple pendulum (any one example)	1 1
III	**PART – C**	
19	In a circular motion, the acceleration of a particle is always directed towards the centre. This acceleration is called centripetal acceleration.	1
	$a = v^2/r$	1
	v = speed, r= radius of circular motion	1
20.	$F \propto \frac{dp}{dt} \Rightarrow F = K\frac{dp}{dt}$	1
	For a body of fixed mass m $\frac{dp}{dt} = \frac{d}{dt}(mv) = m.\frac{dv}{dt} = ma$	1
	F = Kma K = 1 Arriving F = ma	1
21	$P = \frac{W}{t}$	1
	$P = \frac{\vec{F}\cdot\vec{x}}{t}$	1
	$P = \vec{F}\cdot\vec{v}$	1
22	The moment of inertia of a planar body about an axis perpendiculr to its plane is equal to the sum ot its moments of inertia about two perpendicular axes concurrent with perpendicular axis and lying in the plane of the body. Explanation Iz = Ix + Iy	2 1
23	By the principle of energy conservation $\frac{mv_i^2}{2} - \frac{GmM_E}{(h+R_E)} = \frac{mv_f^2}{2}$	1
	$\frac{mv_i^2}{2} - \frac{GmM_E}{(h+R_E)} \geq 0$	1
	Arriving $(v_i)_{min} = \sqrt{2gR_E}$	1

24	 marking of yield point and fracture point	**Graph 1** **1 mark each**
25	1. Area of cross section of the bar (A). 2. Difference in temperature $(T_1 - T_2) = T$, between the two faces. 3. time 't' for which the heat flows 4. distance between the two faces 'd' of the bar. **Any three dependence**	**1 mark each**
26	Degrees of freedom of a molecule ; *Number of co-ordinates required to specify the configuration of system of molecules* Statement of law of equipartition of energy. Explanation	**1** **1** **1**
	PART – D	
IV	**Answer any two**	
27	Explanation of V-t graph	**1**
	Correct graph	**1**
	$x = \frac{1}{2}(v - v_0)t + v_0 t$	**1**
	Arriving at $x = v_0 t + \frac{1}{2}at^2$	**2**
28	Statement	**1**
	Diagram	**1**
	Proof	**3**
29	Definition of angular momentum.	**1**
	Definition of Torque.	**1**
	Derivation of $\frac{d\vec{l}}{dt} = \tau$	**3**

V	**Answer any two**	
30	Definition of latent heat of fusion	**1**
	Defintion of laent heat of vapourisation	**1**
	Graph	**1**
	Explanation	**2**
31	Definition of beats	**1**
	$s_1 = a\cos\omega_1 t$ and $s_2 = a\cos\omega_2 t$	**1**
	$S = S_1 + S_2 = a\left(\cos\omega_1 t + \cos\omega_2 t\right)$	**1**
	Arriving at $S = \left[2a\cos\omega_b t\right]\text{cas}\omega_a t$	**1**
	Showing $\upsilon_{beat} = \upsilon_1 - \upsilon_2$	**1**
32	Definition of Carnot engine	**1**
	Diagram	**1**
	Explanation of Carnot cycle	**3**
VI	**Answer any three**	
33	The maximum height , $h_m = \frac{(v_0 \sin\theta_0)^2}{2g}$	**1**
	$h_m = 40\text{m}$	**1**
	The time taken to return to to same level $T_f = \frac{(v_0 \sin\theta)}{g}$ = 5.8s	**1**
	$R = \frac{(v_0{}^2 \sin 2\theta_0)}{g}$	**1**
	$R = 276\text{m}$	**1**
34	Formula WD = mgh = $\rho v g h_{av}$ Substitution and calculation Arriving at 7.546×10^7J unit	**1** **2** **1** **1**
35	$g_m = \frac{GM_m}{R_m{}^2}$ ----------(1) formula $g_E = \frac{GM_E}{R_E{}^2}$ ----------(2) *dividing eqn* 1 *and* 2 $\frac{g_m}{g_E} = \frac{M_m}{M_E}\frac{R_E{}^2}{R_m{}^2}$ substitution and simplification	**1** **1** **2**

	arriving at $\frac{g_m}{g_E} = \frac{1}{4}$	**1**
36	$Q = \frac{KA(T_1 - T_2)t}{x}$	**1**
	Substitution and arriving at $Q = 104976J$	**1**
	$Q = ml$	**1**
	$m = \frac{Q}{l} = 0.313Kg$	**1**
	Mass left after 6 hrs, 4 – 0.313 = 3. 687 kg	**1**
37	i) a) $\upsilon' = \left(\frac{v - v_0}{v - v_s}\right)\upsilon$	**1**
	Substituion and arriving at $\upsilon' = 412.12$ Hz	**1**
	b) $\upsilon' = \left(\frac{v - v_0}{v + v_s}\right)\upsilon$	**1**
	Substitution and arriving at $\upsilon' = 384$	**1**
	ii) Speed of sound in each case = $340 ms^{-1}$	**1**

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I PUC PRACTICAL EXAMINATION
PHYSICS (33)

General instructions:

- Duration of practical examination: 2 hours.
- Maximum marks allotted: 30 marks.
- At least TEN (10) different experiments have to be set in the practical Examination.

Scheme of Evaluation

A. Weightage of marks

Sl. No.	Particulars	Marks
I	Performing the Experiment	20
II	Viva -voce	04
III	Practical Record	06
TOTAL		**30**

B. Distribution of marks

I. Performing the Experiment

Sl. No.	Particulars	Marks
1	Writing the principle of the experiment	2
2	Writing the formula and explaining the terms	2
3	Writing the diagram / figure / circuit with labeling (At least two parts)	2
4	Writing the tabular column/ observation pattern	2
5	Constructing the experimental set up/ circuit	3
6	Performing the experiment and entering the readings into the tabular column / Observation pattern	4
7	Substitution and calculation/plotting the graph and calculation	3
8	Result with unit	2
Total		**20**

NOTE FOR SL. NO. 6:

- At least three (3) trials have to be taken in case of finding mean value.
- At least six (6) readings have to be taken in case of plotting the graph.

II. Viva- voce

1. Four questions must be asked and each question carries 1 mark.
2. The questions in the *viva- voce*should be simple, direct and related to the experiment to be performed by the student.

III. Practical Record

Sl. No.	Particulars	**Marks**
1	If the student has performed and recorded 13 experiments or more (91% to 100% of the experiments prescribed for the practical examination or more)	**6**
2	If the student has performed and recorded 11 or 12 experiments. (81% to 90% of the experiments prescribed for the practical examination)	**5**
3	If the student has performed and recorded 10 experiments.(71% to 80% of the experiments prescribed for the practical examination)	**4**
4	If the student has performed andrecordedbelow 10 and above 5 experiments. (41% to 70% of the experiments prescribed for the practical examination)	**3**
5	If the student has performed and recorded 5 or less than 5 experiments. (40% & below 40% Of the experiments prescribed for the practical examination)	**0**

NOTE: AtleastFOURTEEN(14) experiments have to be conducted in the practicalclasses.

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