

Examination: BA/BSc.

Maximum Marks: 40

Paper: Physics-II (B)

Max. Time Allowed: 3 Hrs.

Note: Attempt any FIVE questions selecting TWO questions from each SECTION-II and SECTION-III. Q.No.1 is compulsory in SECTION-I.

SECTION - I

Give short answers of any FOUR parts of the followings.

S.No.	Questions	Marks
Q.No.1	a) What happens to the frequency of a swing as its oscillations die down from large amplitude to small?	2
	b) Explain why the temperature of a gas drops in an adiabatic expansion.	2
	c) Explain why the specific heat at constant pressure is greater than the specific heat at constant volume?	2
	d) Give some examples of the irreversible process in nature.	2
	e) Why do radio wave diffract around building although light wave do not?	2

SECTION - II

Q.No.2	a) What is Physical Pendulum? Show that its motion is Simple Harmonic. Also derive a relation for its time period.	4
	b) Derive the relation for Wave Equation.	4
Q.No.3	a) Define the adiabatic process. Derive the relation for the work in adiabatic process?	4
	b) Show that $C_p - C_v = R$.	4
Q.No.4	a) What is Carnot Engine? Explain it. Also derive the relation for Efficiency of Carnot Engine.	4
	b) Explain Young's Double Slit Interference Experiment. Derive the relations for maxima and minima.	4

SECTION - III

Q.No.5	a) A simple pendulum of length 1.53 m completes 72 vibrations in 180 s. Find the value of acceleration due to gravity at this point.	4
	b) Calculate the speed of transverse wave in a cord of length 2.15 m and mass 62.5 g under a tension of 487 N.	4
Q.No.6	a) (i) Find the speed of wave on an 870 mg string 22 cm length, if the frequency of fundamental is 920 Hz. (ii) Calculate the tension in the string.	4
	b) At what temperature is the average translational kinetic energy of a molecule is an ideal gas equal to 1.00 eV?	4
Q.No.7	a) A sample of 'n' mole of an ideal gas undergoes an isothermal expansion. Find the heat flow into gas in terms of the initial and final volumes and the temperature.	4
	b) How much water remains unfrozen after 50.4 KJ of heat have been extracted from 258 g of liquid water initially at 0°C?	4
Q.No.8	a) Find the slit separation of a double slit arrangement that will produce bright interference fringes 1.00° apart in angular separation. Assume a wavelength of 592 nm.	4
	b) A slit of width "a" is illuminated by white light. For what value of "a" does the first minimum for red light $\lambda = 650$ nm fall at $\theta = 15^\circ$?	4