Subject: Physics   **Assignment No: IV**
Allotment Date: 25 /01/2019   **Submission Date: 04/02/2019**

S.No	QUESTION	MARKS	LEVEL
	OBJECTIVE TYPE		
1.	What are two characteristics of oscillating system?	1	Knowledge
2.	Plot the graphs for displacement-time and velocity-time in simple harmonic motion.	1	Understanding
3.	A motor tyre pumped to a pressure of 3 atmosphere suddenly bursts. Calculate the fall in temperature due to adiabatic expansion. The temperature of air before expansion is 27^0 C Given γ= 1.4	1	hot
	SHORT ANSWER TYPE I		
4.	What is simple pendulum? Show that motion executed by the bob of the pendulum is simple harmonic. Derive an expression for its time period	2	knowledge
5.	Establish the relation between two specific heats of a gas.	2	understanding
6.	At what distance from the mean position in S.H.M. the energy is half the kinetic and half potential.	2	logic
7.	A body is dropped in a hole drilled across the diameter of the earth. This body shall executes S.H.M What is the time period of SHM	2	Hot
	SHORT ANSWER TYPE II		
8.	A spring is of spring constant k=15N/m. It is cut into 3 equal parts, which are joined in parallel. What is the spring constant of the combination?	3	understanding
9.	A displacement in S.H.M. is given by y=5 (sin3πt+√3cos3πt) Where y and t are in meter and seconds respectively. Deduce amplitude and frequency in the motion.	3	Multi conceptual
10.	Derive an expression for work done during an isothermal process. A box is with insulating walls is divided into two parts by a partition. Half of the box is occupied by ideal gas. Other half is completely evacuated. Will there be any temperature change if the partition is suddenly removed	3	Multi conceptual
	Long NSWER TYPEA II		
11.	Explain the formation of standing waves in a case of a pipe closed at one end by applying superposition principle to wave functions of incident and reflected waves Describe the various modes of vibrations	5	Logic
12.	a. A heat engine is having a source at temperature 527^0C and sink at 127 ^{0}C If the useful work is required to be done by the engine at the rate of 75 watt, then find out the amount of heat absorbed by the engine per second from the source. Also find the efficiency of heat engine. b. Discuss the four steps of a Carnot cycle and show that the efficiency of Carnot cycle is η=1-T_2/T_1	5	Hot