Shree H.N.Shukla College of Science Rajkot
B.Sc. (Sem. -IV) Prelims Exam (CBCS)
[401-PHYSICS]

DATE: - 13/03/2018 **Total marks- 70**

Q-1(A) Give the answer of following question. **[04]**

1) What is call open system?
2) What is call sink in heat engine?
3) What is value of J?
4) What is Mayer's formula?

(B) Give the answer any one of following question. **[02]**

1) What is zero law of thermodynamics?
2) Define isochoric process

(C) Give the answer any one of following question **[03]**

1) Explain working of a porous plug experiment.
2) Discuss operation 1 of a Carnot's cycle.

(D) Give the answer any one of following question. **[05]**

1) Explain specific heat of gases.
2) Describe reversible and irreversible processes.

Q-2(A) Give the answer of following question. **[04]**

1) What is the unit of entropy?
2) What is value of entropy at absolute zero?
3) What is called-S diagram?
4) Kirchhoff's law tells that _____absorbers are ____emitters.

(B) Give the answer any one of following question. **[02]**

1) Draw the temperature-entropy diagram.
2) Give the name of three parts of the process: Entropy of a stem.

(C) Give the answer any one of following question **[03]**

1) Explain third law of Thermodynamics.
2) Write the equation of entropy per unit mass of a perfect t gas in terms of (i) T and V (ii) T and P and (iii) P and V.

(D) Give the answer any one of following question. **[05]**

1) Discuss: application of the entropy principle.
2) Derive Stefan –Boltzmann's law.

Q-3(A) Give the answer of following question. **[04]**

1) Fill up the blank, for a _____Process, the change in enthalpy is equal to the ____.
2) What is the equation of enthalpy H?
3) Write the change in Gibb's free energy of the system in terms of S, T, V and P.
4) In which process enthalpy becomes constant?

(B) Give the answer any one of following question. **[02]**

1) What is first TDS equation?
2) What is Maxwell's second thermodynamic relation?

(C) Give the answer any one of following question **[03]**

1) Show that $C_p - C_v = R$.
2) Prove that $(E_S/E_T) = (C_P/C_V)$.

(D) Give the answer any one of following question. **[05]**

1) State the Maxwell's four thermodynamically relation and describe Joule-Thomson effect and Joule-Thomson co-efficient.
2) Write the Maxwell's four thermodynamically relations and drive clapeyron's latent heat equation.

Q-4(A) Give the answer of following question. **[04]**

1) Photo diode converts _____ energy into _____energy.
2) Thermistor made up from _____types of materials.
3) Write a full name of UJT.
4) What is encoder?

(B) Give the answer any one of following question. **[02]**

1) State De-Morgan's theorems.
2) Define the type of thermistor NTC and PTC.

(C) Give the answer any one of following question **[03]**

1) Explain the characteristics of Varactor diode.
2) Explain LED as a seven-segment display.

(D) Give the answer any one of following question. **[05]**

1) Explain universal gates.
2) 2draw an equivalent circuit of a UJT and discuss its working using it.

Q-5(A) Give the answer of following question. **[04]**

1) The power factor of an R-L circuit lies between _____ and ____.
2) Which type of instrument is used as a detector?
3) An oscillator which does not require any input signal and still produces wave of specific frequency is known as _____.
4) $kA_v \geq 1$ is known as _____.

(B) Give the answer any one of following question. **[02]**

1) Define the LC oscillators.
2) Write conditions that must be satisfied for bridge balance.

(C) Give the answer any one of following question **[03]**

1) Explain R-L series circuit.
2) State the advantage and disadvantage of Hartley oscillator.

(D) Give the answer any one of following question. **[05]**

1) Explain Owens's bridge.
2) Explain the working of Hartley oscillator.