

B.Sc. Semester - 4 (CBCS) Examination
April/May -2022 [OLD COURSE]
PHYSICS (CORE)

Time: 2:30 Hours**Marks: 70****Instructions:**

1. All questions are compulsory.
 2. Figures to the right indicate marks.
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Q - 1 A Answer any one question. **07**

1. Write note on thermodynamic system.
2. Explain first law of thermodynamic.

B Answer any one question. **04**

1. Derive the formula for the work done during an adiabatic process.
2. Discuss porous-plug experiment.

C Answer any three questions. **03**

1. Thermos flask is an example of isolated system in thermodynamics.
(True/False) _____
2. Specific heat of a gas at constant pressure (C_p) is greater than the specific heat at constant volume (C_v). (True/False) _____
3. If a system undergoes a change in which the pressure is kept constant the Process is called _____ process.
4. The experiment for the study of Jule-Thomson effect is known as _____ experiment.
5. $C_p - C_v = R$ is known as _____ formula.

Q - 2 A Answer any one question. **07**

1. Discuss distribution of energy in black body spectrum and discuss its results.
2. Explain change in entropy in reversible and irreversible process.

B Answer any one question. **04**

1. Explain concept of entropy.
2. Define Stefan - Boltzmann law.

C Answer any three questions. **03**

1. When irreversible process occur, the entropy of the universe increases.
(True/False) _____
2. In a cycle of reversible process, the total change in entropy is always zero.
(True/False) _____
3. Stefan's law state that $E = \sigma T^4$. (True/False) _____
4. Kirchhoff's law tells that good absorbers are not good emitters.
(Yes/No) _____
5. $\lambda_m T = \text{constant}$, this is known as Wien's law. (Yes/No) _____

Q - 3 A Answer any one question. **07**

1. Define thermodynamic potentials. Discuss : Enthalpy and Gibb's function.
2. State the Maxwell's thermodynamical relations and deduce TdS equations.

B Answer any one question. **04**

1. Explain Helmholtz free energy(F).
2. Discuss internal energy of the system in terms of thermodynamic variables.

C Answer any three questions.

03

1. The Helmholtz free energy remains constant during isothermal isochoric Process. (True/False) _____
2. Enthalpy not remains constant in a reversible isobaric adiabatic process. (True/False) _____
3. The relation between Gibb's function and Helmholtz function is $G = F + PV$? (Yes/No) _____
4. Enthalpy is $H = U + PV + R$? (Yes/No) _____
5. The first law of thermodynamics is $dQ = dU + dW$ (Yes/No) _____

Q - 4 A Answer any one question.

07

1. What do you meant by logic gate ? Explain main three logic gate.
2. Write a note on U J T

B Answer any one question.

04

1. Discuss U J T relaxation oscillator.
2. Write full form of LED and describe multicolour LEDS.

C Answer any three questions.

03

1. A photo diode is always connected in forward biased (True/False) _____
2. A signal which is continuously varying with respect to time is called digital signal (True/False) _____
3. NOT gate has only one input and one output and it is known as inverter. (True/False) _____
4. NOR gate is a known as Universal gate. (True/False) _____
5. JFET is a Unipolar device. (True/False) _____

Q - 5 A Answer any one question.

07

1. Write principle and action of phase shift oscillator and discuss its advantages and disadvantages.
2. Write a note on L-C-R series a.c. circuit.

B Answer any one question.

04

1. What is colpitt oscillator ? Describe in detail.
2. Write a note on De sauty's bridge.

C Answer any three questions.

03

1. The process in which small portion of output is re-introduced as input to an amplifier is known as _____.
2. The number of cycle per second (unit time) of an alternating current is known as a _____.
3. The frequency of LC oscillation is given by $f =$ _____.
4. In owen's bridge the value of capacitor c_3 is much larger than the _____.
5. In phase shift oscillator's circuit gives small output because distortion level is nearly _____ %
