



Sanjay Ghodawat University, Kolhapur

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

2019-20

EXM/P/09/00

B. Sc-II

School of Science

Sem III

PHS201

Physics-III

Max

Marks: 20

Day: Monday

Date: 18/11/2019

Section-A
End Semester Examination
Time: 30 minutes

10:30am to 11am

Seat No.:

PRN No.:

Student Sign:

Invigilator Sign:

Examiner Sign:

Marks Obtained:

Instructions:

- 1) All Questions are compulsory.
- 2) Mark \surd to the correct option. Do not circle.
- 3) More than one options marked will not be considered for assessment.
- 4) Rough calculations on paper are not allowed.
- 5) Use of non-programmable calculator is allowed.

Q.1 Select the correct alternative

Marks	Bloom's level	CO
(12)		

- | | | | | |
|----|---|----|-----------|-------|
| 1. | The property that is independent on mass of the system is called as ----- property. | 01 | L3 | 201.1 |
| a) | extensive | b) | intensive | |
| c) | thermal | d) | physical | |
| 2. | Algebraic sum of net heat and work interaction between system and surrounding in a thermodynamic cycle is ----- | 01 | L1 | 201.1 |
| a) | Zero | b) | One | |
| c) | Two | d) | Three | |
| 3. | For isothermal expansion, entropy ----- | 01 | L1 | 201.2 |
| a) | Increases | b) | Decreases | |
| c) | Remains same | d) | Zero | |
| 4. | Helmholtz free energy is given by ----- | 01 | L1 | 201.2 |



Sanjay Ghodawat University, Kolhapur

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

2019-20

EXM/P/09/00

B. Sc II

School of Science

Sem III

Course code
PHS201

Course title Physics III
Section-B
(Thermal Physics and Statistical Mechanics)

Max
Marks: 80

Day: Monday

End Semester Examination

Date: 18/11/2019

Time: 2.30 hr

11am to 1.30pm.

Instructions:

- 1) All Questions are compulsory.
- 2) Rough calculations on paper are not allowed.
- 3) Use non-programmable calculator is allowed.

Q.2	Answer the following questions	Marks (12)	Bloom's level	201.1
a)	Explain thermodynamic process and quasi equilibrium state.	8	L2	
b)	Derive the expression for specific heat at constant pressure.	4	L3	
OR				
b)	Derive the expression for work done during an isothermal process.	4	L3	
Q.3	Answer the following questions	Marks (12)	Bloom's level	201.2
a)	Explain thermodynamic potentials in detail.	8	L2	
OR				
a)	State and prove Carnot's theorem.	8	L2	
b)	What is the size of a degree?	4	L4	
OR				
b)	A Carnot's engine has an efficiency of 30 % when the temperature of the sink is 27 °C. What must be the change in temperature of the source to make its efficiency 50 %.	4	L4	

ESE

Q.4	Answer the following questions	Marks (28)	Bloom's level	201.3
a)	Derive Maxwell-Boltzmann distribution and calculate values of constants.	16	L3	
b)	Derive the expression for root mean square (r.m.s.) velocity.	8	L2	
OR				
b)	What is a transport of thermal conductivity? Derive the expression for coefficient of thermal conductivity.	8	L2	
c)	Derive the expression for mean free path.	4	L1	

Q.5	Answer the following questions	Marks (28)	Bloom's level	201.4
a)	Derive Planck's radiation law.	16	L3	
b)	Derive Stefan's Law from Planck's radiation law.	8	L3	
OR				
b)	Derive Fermi-Dirac Distribution law.	8	L3	
c)	What is Phase space?	4	L1	