



Progressive Education Society's
Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16
End Semester Examination: **2023-24**
Faculty: Science and Technology

Program: B.Sc. Blended Semester: I SET: A
Program (Specific): BSc. Blended (Chemistry) Course Type: Core course
Class: F.Y.B.Sc Blended Max. Marks: 30
Name of the Course: Introductory Classical Physics
Course Code: PHY101 Time: 2 Hr
Paper: II

Instructions to the candidate:

- 1) *There are 3 sections in the question paper. Write each section on separate page.*
- 2) *All Sections are compulsory.*
- 3) *Figures to the right indicate full marks.*
- 4) *Draw a neat, labelled diagram wherever necessary.*
- 5) *Use of calculator and log table is allowed.*

Q1) Select the correct option. (Any 5 out of 7)

[1M x 5 = 5M]

1. Select the scalar term from the following.
a) energy
b) force
c) dT = 0
d) dT = constant
2. For an isothermal process _____.
a) $dT = 0$
b) $dQ = 0$
c) $dT = \text{constant}$
d) $dQ = \text{constant}$
3. When the temperature of the system increases, internal energy _____.
a) decreases
b) increases
c) remains constant
d) becomes zero
4. Entropy is a measure of _____.
a) perfect order
b) available energy
c) disorder
d) increase in temperature
5. _____ force is an example of pseudo force.
a) Centripetal
b) Centrifugal
c) Nuclear
d) Gravitational
6. _____ force is the strongest and short distance force in nature.
a) Gravitational
b) Nuclear
c) Electromagnetic
d) None of these
7. When particle moves in circular path work done is _____.
a) 0
b) infinite
c) 1
d) -1

Q2) Answer the following (Any 5 out of 7)

[2M x 5 = 10M]

1. A coolie lifts a load of 30 kg and puts it on his head which is 200 cm above the surface of platform. Calculate the work done.
2. State work-energy theorem.
3. Calculate the work done by motion of a particle along a vector $\vec{r} = (3\vec{i} - \vec{j} + 6\vec{k})$ meter if the applied force is $\vec{F} = (\vec{i} - 3\vec{j} + 2\vec{k})$ newton.
4. State zeroth law of thermodynamics.
5. Explain reversible change using an appropriate example.
6. What are conservative and non-conservative forces?
7. State Kepler's third law.

Q3) Answer the following (Any 3 out of 5)

[5M x 3= 15M]

1. The initial velocity of a body is 20m/sec, evaluate its velocity after 2.5 sec if it accelerates uniformly at 4.5 m/sec².
2. The position of a car on a straight road with time is given by the following function of time $x(t) = 10 + 25t + 5t^2$, where x is in metres and time in seconds. Calculate the instantaneous velocities at time t= 1 sec, 2sec, 5 sec.
3. Calculate the work done during an isothermal expansion of 4 moles of an ideal gas from a volume of 4 litres to 16 litres at 0°C. (R = 8.3 J/mole/K)
4. 1.2 litres of hydrogen at 137 °C and 10⁶ dyne/cm² pressure expands isothermally, until its volume is doubled. Find the pressure of the gas.
5. State and prove Bernoulli's theorem.

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