Progressive Education Society's
Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16
End Semester Examination: Jan.2022
Faculty: Science and Technology

Program: Biotech (04) **Semester: I** **SET: C**
Program (Specific): B.Sc. (Biotechnogoly) **Course Type: Core**
Class: F. Y. B. Sc. (Biotechnology)
Max. Marks: 35
Name of the Course: Fundamentals of Physics
Course Code: 22 BBT 102 **Time: 2Hr**
Paper: -

Instructions to the candidate:

1) ***There are 4 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 well labelled diagram wherever necessary.***
5) ***Use of calculator and log table is allowed.***

SECTION: A

Q1) Answer the following questions (Attempt any 5/6) 5

1. **What are derived units? Give two examples.**
2. **What is meant by atmospheric pressure?**
3. **State Newton's law of viscosity.**
4. **What is wettability of a liquid?**
5. **Write do you understand by capillary action?**
6. **What is optical power.**

SECTION: B

Q2) Short answer questions (Attempt any 5/6) 10

1. **Classify the following unites into fundamentals and derived unites: Kilogram, ampere, Newton, Candela, Kelvin, joule, volt, ohm, area, volume.**
2. **Write the use of sound waves in medicine and navigation.**
3. **Define beats. Explain what is waxing and waning.**
4. **Give four applications of capillary action.**
5. **State and explain Doppler effect.**
6. **Define coefficient of viscosity and obtain its units.**

SECTION: C

Q3) Short answer questions (Attempt any 2/4) 8

1. **How does Physics help in explaining the facts in life sciences?**

2. **Describe soap bubble method to determine the surface tension of a liquid. Derive necessary formula.**
3. **A train is travelling at a speed of 90Km/hour. The frequency of note produced by the whistle of train is 520 Hz. Find the frequency of sound heard by a stationary observer when the train approaches him. (Velocity of sound=340 m/sec)**
4. **A glass of unknown index of refraction is shaped in the form of isosceles prism with an apex angle of 25^0. In the laboratory, with the help of laser beam and a prism table, the minimum angle of deviation for this prism is measured carefully to be 15.8^0. What is the refractive index of the glass material?**

SECTION: D

Q4) Long answer Questions (Attempt any 2/4) 12

1. **With the help of a neat diagram explain construction and working of an Ostwald's viscometer. Derive the necessary formula.**
2. **Explain the principle, construction and working of compound microscope with the help of a diagram.**
3. **What is interference? Give the analytical treatment for obtaining expressions for maximum and minimum intensity in an interference pattern.**
4. **Define surface tension. Describe Jaeger's method to determine surface tension of a liquid.**