Progressive Education Society's

Modern College of Arts, Science & Commerce Ganeshkhind, Pune – 16, NEP 2020 (Autonomous)

End Semester Examination: March/April 2024

***Total No. of Questions**: 4 /19* ***Total No. of Pages**: 1*

First Year (B.Sc. (Blended))
PHY201: Modern Physics
(Semester II)

Program: B.Sc. Blended **Credits:** 2
Program Specific: B.Sc. Blended (Chemistry) **Time:** 2 Hours
Course Type: CC **Max. Marks:** 30
SET: A

Instructions to the candidate:

1) *All questions are compulsory.*
2) *Figures to the right indicate full marks.*
3) *Draw a well labeled diagram wherever necessary.*

Q1] Answer the following (Attempt any 5/6) **[5 X 1= 5]**

i) What is interference of light.
ii) State two conditions of diffraction.
iii) Draw the sketch of different types of convex lenses.
iv) State Coulomb's law.
v) State the postulates of special theory of relativity?
vi) State Kirchhoff's current law.

Q2] Answer the following (Attempt any 5/7) **[5 X 2 =10]**

i) Find refractive index of the lens if angle of incidence is 30^o and angle of refraction is 20^o.
ii) What is electrical potential energy of system?
iii) Calculate the force between two balls each having a charge of 12μC and 8cm apart. (Given- $1/ 4\pi\varepsilon_0 = 9 \times 10^9$ Nm^2/ C^2)
iv) What is the value of capacity if capacitor stores 0.6 Coulomb charges at 20 volt?
v) What are non-polar materials?
vi) What are Galilean transformations?
vii) State Ohm's law.

Q3] Answer the following/Write short notes on following (Attempt any 2/4) **[2 X 5 = 10]**

i) Distinguish between conductors and insulators.
ii) Derive lens formula.
iii) Calculate the focal length of a plano-convex lens for which the radius of curved surface is 25 cm and refractive index 1.5.
iv) Derive relation for length contraction.

Q4] Answer the following (Attempt any 1/2) **[1 X 5 = 5]**

i) 4 point charges 10 μC, 15μC, 10μC and -20μC are placed on 4 corners A,B,C and D respectively of square ABCD of side 4 m. calculate the total force on 15μC due to other three charges.
ii) Draw diagram for Michelson Morley experiment. Explain the physical significance of negative result.

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