647510 **BSC2PhyC201x** **Seat No :_____**

B.Sc. Semester - 2 (*CBCS*) Examination
March/April – 2023 (New Course)
PHYSICS (CORE)

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

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Q.1(A) Answer the following questions. (Any Two) **(10)**

1. What is Doppler Effect? Discuss its effect when observer is stationary and source is moving?
2. Explain velocity of transverse wave on a string.
3. Explain speed of sound in a material medium.

Q.1(B) Answer the following question. (Any One) **(04)**

1. Write a note on acoustics of buildings.
2. Explain in brief: Laws of transverse vibrations of a string.

Q.2(A) Answer the following questions. (Any Two) **(10)**

1. Explain characteristics of CE transistor connection.
2. Discuss the use of zener diode as a voltage regulator.
3. What is half wave rectifier? Prove that the maximum efficiency of a half wave rectifier is 40.6%.

Q.2(B) Answer the following question. (Any One) **(04)**

1. Why common emitter (CE) configuration is most preferred in circuit?
2. Describe the basic principle of filter circuit.

Q.3(A) Answer the following questions. (Any Two) **(10)**

1. Explain Lloyd's single mirror and derive the formula of wavelength of light.
2. Discuss interference by reflected light.
3. Explain Huygens Principle of wavefront.

Q.3(B) Answer the following question. (Any One) **(04)**

1. Write the conditions for interference of light.
2. Describe superposition of waves.

Q.4(A) Answer the following questions. (Any Two) **(10)**

1. Write a short note on zone plate.
2. Explain Fraunhofer diffraction due to a single slit.
3. Discuss diffraction pattern of a straight edge.

Q.4(B) Answer the following question. (Any One) **(04)**

1. Give the difference between Fresnel and Fraunhofer diffraction.
2. Compare the grating spectra with prism spectra.

Q.5(A) Answer the following questions. (Any Two) **(10)**

1. Discuss electric field around uniformly charged spherical shell.
2. Discuss energy stored in magnetic field.
3. State and derive Gauss's theorem.

Q.5(B) Answer the following question. (Any One) **(04)**

1. Write a note on mutual inductance.
2. Discuss electric field around an infinite line of charge.

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