

BSC2PhyC201x
B.Sc. Semester - 2 (CBCS) Examination
March/April -2019 (New Course)
PHYSICS(CORE)

Seat No : _____

Time: 2:30 Hours

Marks: 70

Instructions:

1. All questions are compulsory.
 2. Figures to the right indicate marks.
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Q.1 (A) Answer any one question.**[7]**

1. Discuss the standing wave on a string fixed at both ends with necessary formulations.
2. Derive Newton's formula for speed of sound in an air with Laplace's correction.

Q.1 (B) Answer any one question.**[4]**

1. Write a note on the law of vibrating string.
2. Write a note on Musical scale.

Q.1 (C) Answer any three questions.**[3]**

1. Write the types of wave motion.
2. Sound waves are elastic waves. Is it true?
3. Write an equation for the velocity of sound in gaseous medium.
4. Loudness is measured in _____.
5. Define the Beats.

Q.2 (A) Answer any one question.**[7]**

1. Derive an expression for efficiency of full wave rectifier.
2. Explain common emitter connection in terms of (i) Amplification factor
(ii) Relation between α and β (iii) Expression for collector current.

Q.2 (B) Answer any one question.**[4]**

1. Write a note on capacitor input filter or π -filter.
2. Write a note on transistor.

Q.2 (C) Answer any three questions.**[3]**

1. Maximum efficiency of half wave rectifier is _____.
2. For half wave rectifier, the value of ripple factor is _____.
3. _____ diode is used as voltage regulator.
4. Which electronic device is used as an amplifier?
5. The value of current amplification factor ' α ' is always _____.

Q.3 (A) Answer any one question.**[7]**

1. What is interference of light? Explain Young's experiment demonstrating interference of light.
2. Explain Fresnel's biprism and derive the formula of wavelength of light, fringe width β , D and d.

Q.3 (B) Answer any one question.**[4]**

1. Write a note on Lloyd's single mirror.

2. Describe the condition for interference of light.

Q.3 (C) Answer any three questions.

[3]

1. Write the types of wave front.
2. In Lloyd's single mirror experiment the fringe width is given by _____.
3. Write the types of techniques of obtaining interference.
4. Newton's rings illustrate the Phenomenon of _____.
5. In Fresnel's biprism the thick angle of prism is about _____.

Q.4 (A) Answer any one question.

[7]

1. Discuss Fraunhofer diffraction due to a single slit. Derive condition for production of maxima and minima.
2. Explain the rectilinear propagation of light. Derive the radius and area of first and second half period zone.

Q.4 (B) Answer any one question.

[4]

1. Write a note on plane diffraction grating.
2. Discuss the action of zone plate and derive the formula of focal length.

Q.4 (C) Answer any three questions.

[3]

1. Which type of lens is used in Fraunhofer diffraction?
2. The radius of the 1st half period zone is given by _____.
3. Focal length of zone plate $f_n =$ _____.
4. For the Fresnel diffraction, the source of light and screen are effectively at finite distances from the obstacle. Is it true?
5. Write the types of diffraction grating.

Q.5 (A) Answer any one question.

[7]

1. State and derive Gauss's theorem.
2. Explain Mutual inductance and derive an equation of M.

Q.5 (B) Answer any one question.

[4]

1. Write a note on electric flux.
2. Explain Faraday's laws of induction.

Q.5 (C) Answer any three questions.

[3]

1. SI unit of electric flux is _____.
2. What is the value of solid angle in Gauss's theorem?
3. The electric field inside a Spherical charged shell is _____.
4. The unit of self-inductance is _____.
5. Define the Lenz's law.
