

B.Sc. Semester - 2 (CBCS) Examination
March/April- 2019 (Old 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 any one question.**07**

1. What are stationary waves? Explain in graphically and mathematically treatment of stationary waves.
2. Write the Newton's formula for velocity of sound in gas and explain Laplace correction.

B Answer any one question.**04**

1. Derive the formula for the velocity of a wave on a stretched string.
2. Explain acoustics in buildings.

C Answer any three questions.**03**

1. Waves on a water surface is a mechanical waves. (True/False) _____
2. The waves motion are four types. (True/False) _____
3. Non – mechanical waves do not require a medium. (True/False) _____
4. When sound waves propagates in a solid material, Its velocity is given by $v = \sqrt{\beta/\rho}$ (True/False) _____
5. When two sound waves of slightly difference frequencies interfere, is called beats. (True/False) _____

Q - 2 A Answer any one question.**07**

1. Derive an expression for efficiency of half wave rectifier.
2. Explain common emitter connection in detail.

B Answer any one question.**04**

1. Explain use of zener diode as a voltage regulator.
2. Write a note on transistor.

C Answer any three questions.**03**

1. For full wave rectifier $I_{dc} =$ _____.
2. For half – wave rectifier maximum efficiency $\eta_{max} =$ _____
3. For full wave rectifier, ripple factor $\gamma =$ _____
4. Zener diode has _____ breakdown voltage.
5. The value of β ranges from _____

Q - 3 A Answer any one question.**07**

1. Explain Young's double slit experiment.
2. What is plane parallel thin film ? In case of plane parallel thin film discuss the interference due to reflected Light.

B Answer any one question.**04**

1. What do you mean by coherent sources ? Give a method for obtaining them.
2. Write a note on Lloyd's single mirror.

C Answer any three questions.

03

1. In interference the fringe width β is defined as _____.
2. Lloyd's mirror interference technique developed in the year _____.
3. How many types of interference ? _____.
4. A transparent thin film of uniform thickness bounded by two parallel surface is known as a _____ thin film.
5. Wedge – shaped thin film having zero _____ at one end.

Q - 4 A Answer any one question.

07

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

B Answer any one question.

04

1. Write a note on plane diffraction grating.
2. Write a note on Zone plate.

C Answer any three questions.

03

1. Transmission and reflecting is a types of diffraction grating. (True/False) _____
2. In Fraunhofer diffraction concave lens are used. (True/False) _____
3. $\pi b \lambda$ is a area of the each half period zone. (True/False) _____
4. In Fresnel diffraction, the source of light and the screen are at infinite distances from the obstacle.(True/False) _____
5. The radius of first half period zone is given by $= \sqrt{b}$ (True/False) _____

Q - 5 A Answer any one question.

07

1. Explain construction and action of a Nical prism. Discuss Nical prism as a polarizer and analyser.
2. Explain Fermat's principle and prove law of reflection.

B Answer any one question.

04

1. State and prove Malus's law.
2. Explain angular dispersion.

C Answer any three questions.

03

1. Polarisation by selective absorption is also known as _____.
2. In Brewster's law equation $\tan \theta_p$ or θ_p is _____.
3. Calcite crystal is also known as _____.
4. The deviation angle of red rays is _____ than violet rays.
5. A pair of conjugate points on the principal axis of the optical system having unit positive angular magnification are called the nodal points of the optical system. Is it true ? _____
