

B.Sc. Semester - 2 (CBCS) Examination
March/April - 2024 (As Per Syllabus Year-2016)
PHYSICS (CORE)

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

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

- Que.1(A) Answer any one question. (07)
- (1) Explain velocity of transverse wave on a string.
 - (2) Discuss Doppler effect in detail.
- Que.1(B) Answer any one question. (04)
- (1) Write a note on laws of vibrating string.
 - (2) Write a note on Musical scale.
- Que.1(C) Answer any three questions. (03)
- (1) Write types of wave motion.
 - (2) Radio waves are elastic waves. Is it true?
 - (3) For the n^{th} normal mode of a string $K = \underline{\hspace{2cm}}$.
 - (4) Loudness is measured in $\underline{\hspace{2cm}}$
 - (5) Velocity of sound in any medium is given by $u = \underline{\hspace{2cm}}$.
- Que.2(A) Answer any one question. (07)
- (1) Derive an expression for efficiency of full wave rectifier.
 - (2) Explain common base connection in detail.
- Que.2(B) Answer any one question. (04)
- (1) Write a note on capacitor input filter or π -filter.
 - (2) Write a note on transistor.
- Que.2(C) Answer any three questions. (03)
- (1) How many diode is used in half wave rectifier?
 - (2) The maximum efficiency of half wave rectifier is $\underline{\hspace{2cm}}\%$.
 - (3) Which electronic component is used as an amplifier?
 - (4) Zener diode is used as voltage regulator. Is it true?
 - (5) The current amplification factor β is in the range from $\underline{\hspace{1cm}}$ to $\underline{\hspace{1cm}}$.
- Que.3(A) Answer any one question. (07)
- (1) Write the conditions for interference and discuss the techniques of obtaining interference
 - (2) Explain Fresnel's Biprism and derive the formula of wavelength of light, fringe width β , D and d.

- Que.3(B) Answer any one question. (04)
- (1) Write a note on Lloyd's single mirror.
 - (2) Write a note on superposition of waves.
- Que.3(C) Answer any three questions. (03)
- (1) Write the types of wave front.
 - (2) In Lloyd's mirror central fringe is dark. Is it true?
 - (3) A plano convex lens is used in Newton's ring experiments. Is it true?
 - (4) In Fresnel's Biprism the thick angle of prism is about _____.
 - (5) How many types of interferences?
- Que.4(A) Answer any one question. (07)
- (1) Discuss Fraunhofer diffraction due to a double slit.
 - (2) Explain action of zone plate and derive the formula of focal length.
- Que.4(B) Answer any one question. (04)
- (1) Write a note on plane diffraction grating.
 - (2) Compare Fresnel and Fraunhofer diffraction.
- Que.4(C) Answer any three questions. (03)
- (1) Write types of diffraction grating.
 - (2) The radius of the 2nd half period zone is given by _____.
 - (3) In Fraunhofer diffraction, the source of light and screen are effectively at _____ distances from the obstacle.
 - (4) The area of half period zone is equal to _____.
 - (5) The angular separation between any two consecutive maxima = _____.
- Que.5(A) Answer any one question. (07)
- (1) Explain polarization by reflection and derive an equation of Brewster's law.
 - (2) Explain Fermat's principle and prove law of refraction.
- Que.5(B) Answer any one question. (04)
- (1) Write a note on Nicol Prism
 - (2) Explain angular dispersion.
- Que.5(C) Answer any three questions. (03)
- (1) The Brewster's law $\mu =$ _____.
 - (2) Nicol prism is used as polarizer. Is it true?
 - (3) For two nodal points $\tan\theta_1 / \tan\theta_2 =$ _____.
 - (4) Angular dispersion $\delta_m =$ _____.
 - (5) Geometrical optics is also known as _____.
