

B.Sc. (F.S.) Semester - 2 (CBCS) Examination
March/April – 2024 (As Per Syllabus Year-2018)
PHYSICS (CORE)

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

1. All questions are compulsory.
 2. Figures to the right indicate marks.
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- Que.1(A) Answer any two questions. (10)
(1) Explain velocity of transverse wave on a string.
(2) Derive an expression of speed of sound in gas.
(3) Explain Doppler Effect.
- Que.1(B) Answer any one question. (04)
(1) Explain interference and principle of superposition.
(2) Explain acoustics of buildings.
- Que.2(A) Answer any two questions. (10)
(1) Derive an expression for the efficiency of a full wave rectifier.
(2) Explain input and output characteristics of common emitter connection.
(3) Explain Zener diode as a voltage regulator.
- Que.2(B) Answer any one question. (04)
(1) Write a note on capacitor input filter.
(2) Explain working of a PNP transistor and importance of transistor action.
- Que.3(A) Answer any two questions. (10)
(1) Explain interference by reflected light.
(2) Explain Young's double slit experiment and derive expressions for bright and dark fringes.
(3) Explain Newton's ring, formation of Newton's ring and write the condition of maximum and minimum intensity.
- Que.3(B) Answer any one question. (04)
(1) Write a note on Lloyd's single mirror.
(2) Explain techniques of obtaining interference.
- Que.4(A) Answer any two questions. (10)
(1) Explain Fraunhofer diffraction at double slit.
(2) Explain rectilinear propagation of light. Derive the radius and area of the first and second half period zone.
(3) Explain action of zone plate.
- Que.4(B) Answer any one question. (04)
(1) Compare Fresnel and Fraunhofer diffraction.
(2) Write a note on plane diffraction grating.
- Que.5(A) Answer any two questions. (10)
(1) Derive an equation of electric field around uniformly charged spherical shell.
(2) State and prove Gauss's theorem.
(3) Explain Self Inductance.
- Que.5(B) Answer any one question. (04)
(1) The self-inductance of the coil is 1 H when passing a current of 5 amps. Calculate the value of the self-induced emf produced in the coil after a time of 50mS.
(2) When a current of 6 A between two coils changes to 10 A on 0.2 S in first coil, induces an emf of 40 mV in the second coil. Calculate the mutual inductance between the two coils.
