

B.Sc. Semester - 2 (NEP-2020) Examination

MARCH/APRIL-2025

PHY: Mechanics and Solid-State Electronics (Major-3)

Time: 2:00 Hours

Marks: 50

Instructions:

1. All questions are compulsory.
 2. Figures to the right indicate marks.
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- Que-1 Answer the following question (any two). (10)
- 1) Derive an equation for velocity of an artificial satellite of earth in an orbit.
 - 2) Explain escape velocity of earth
 - 3) Write a short note on GPS.
- Que-2 Answer the following question (any two). (10)
- 1) Write a short note on semiconductor diode.
 - 2) Describe circuit details and working of half wave rectifier with necessary circuit diagram.
 - 3) Write a short note on zener diode as a voltage regulator.
- Que-3 Answer the following question (any two). (10)
- 1) Write a short note on transistor action.
 - 2) Explain common base connection in detail.
 - 3) Discuss the input and output characteristics of common emitter transistor circuit.
- Que-4 Answer the following question (any five). (10)
- 1) Give the statement of Newton's law of gravitation and write the equation of it.
 - 2) Define gravitational field and intensity of gravitational field.
 - 3) Write statements of Kepler's first and second laws of planetary motion.
 - 4) Describe working of capacitor filter circuit.
 - 5) Describe working of choke input filter circuit.
 - 6) Give the definition of rectifier efficiency and ripple factor.
 - 7) Draw the circuit diagram of common emitter connection for NPN and PNP transistor.
 - 8) In a common emitter configuration, if $\beta=100$ and $I_B=50\mu A$, calculate the value of collector current.
 - 9) Discuss stability factor.
- Que-5 Answer the following question (any two). (10)
- 1) Explain the state of weightlessness.
 - 2) Write a note on full wave bridge rectifier.
 - 3) Explain base register method.
