

25U204S

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Name:

Reg.No:

SECOND SEMESTER B.Sc. DEGREE EXAMINATION, APRIL 2026

(CBCSS - UG)

CC19UPHY2B02 / CC20UPHY2B02 - MECHANICS - II

(Physics - Core Course)

(2019 to 2023 Admissions - Supplementary)

Time : 2.00 Hours

Maximum : 60 Marks

Credit : 3

Part A (Short answer questions)

Answer **all** questions. Each question carries 2 marks.

1. Distinguish between inertial and non-inertial frame of reference.
2. What are tides and how are they formed?
3. What are the effects of acceleration of a lift on the weight of a person inside it?
4. What happens to a freely falling body under the coriolis force of earth
5. Why the tide winds are shifting to north - west and south-West?
6. Write down the relation between $r_{\max}$, $r_{\min}$ and eccentricity e
7. Explain the terms perigee and apogee.
8. What is free oscillation ?
9. Using initial conditions, obtain an expression for phase angle.
10. What is dispersion law?
11. What is dispersion?
12. What is pulse in wave motion?

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

Answer **all** questions. Each question carries 5 marks.

13. Obtain an expression for the total energy of a particle in a central force field.
14. Write down the expression for the eccentricity of an orbit. What is its relevance?
15. The mean distance of Mars from the Sun is 1.524 times that of the earth from the sun. How many years would be required for mars to make one revolution around the sun?
16. Draw the displacement-Time graph of damped LHO.

17. Obtain the solution of equation of motion of a driven harmonic oscillator.
18. A steel wire of 0.72 m long has a mass of 5×10^{-3} kg. If the wire is under a tension of 60N what is the speed of transverse waves on the wire?
19. A metal wire of 4m length and 0.2mm radius fixed vertically at one end. At the lower end, a 10 kg mass is suspended. As a result, it elongates by 15.5mm. The density of the metal is 7800 kg/m^3 . If the transverse waves are now send through this wire, find its velocity.

(Ceiling: 30 Marks)

Part C (Essay questions)

Answer any *one* question. The question carries 10 marks.

20. Discuss the problem of two non-interacting particles moving parallel to each other. What is the effective potential? Draw the energy level diagram.
21. Set up the differential equation for a forced harmonic oscillator and solve it. Hence obtain the condition for resonance.

(1 × 10 = 10 Marks)
