D 103779 **(Pages : 2)** **Name.....**

Reg. No.....

SECOND SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2024

Physics/Applied Physics

PHY 2B 02/APH 2B 02—MECHANICS

(2019 Admission only)

Time : Two Hours Maximum : 60 Marks

Section A (Short Answer Type)

Answer **all** *questions in two* **or** *three sentences.*
Each correct answer carries maximum of 2 *marks.*

1. Explain one example for fictitious force.
2. Define Coriolis Force.
3. What is a Foucault pendulum ?
4. What are the general properties of central force motion ?
5. Define Apogee.
6. Define the law of equal areas.
7. Write down the general equation of harmonic oscillator and the standard form of the solution.
8. Define the Q of an oscillator
9. What is a forced oscillator ?
10. What is energy flux ?
11. Define phase velocity.
12. Give an example of SHM.

(Ceiling - 20)

Turn over

Section B (Paragraph / Problem Type)

Answer **all** *questions in* **a paragraph** *of about* **half a page to one page.**
Each correct answer carries a maximum of 5 *marks.*

13. Define and explain Galilean transformation.

14. Illustrate the effect of the Coriolis force in the rotation of earth.

15. Solve the problem involving the third law of Kepler's planetary motion to calculate:

    a) Period ; and

    b) Frequency of earth if It takes 365.25 days to complete one revolution around the sun.

16. A satellite of mass m = 2,000 kg is in elliptic orbit about the earth. At perigee it has an altitude of 1,100 km and at apogee its altitude is 4,100 km. What are the satellite's energy and angular momentum ?

17. Calculate the spring constant for a spring oscillates at 12 Hz with a Q of 50 when a mass of 1.5 kg mass attached to it.

18. Determine the fourier series of the function $f(x) = 1 - x^2$ in the interval [– 1, 1].

19. Calculate the refractive index of the medium in which the speed of light is 2.5×10^8 m/s ?

(Ceiling - 30)

Section C (Essay Type)

Essays.
Answer in about **two pages**, *any* **one** *question.*
Answer carries 10 *marks.*

20. With a neat sketch explain energy equation and energy diagrams.

21. Define and explain different types of damped harmonic oscillation.

(1 × 10 = 10 marks)