THIRD SEMESTER B.Sc./M.Sc. INTEGRATED GEOLOGY DEGREE EXAMINATION, NOV. 2024

(CBCSS - UG)

(Regular/Supplementary/Improvement)

CC19U PHY3 C03 / CC20U PHY3 C03 / CC23 PHY3 IC03 -
MECHANICS, RLATIVITY, WAVES AND OSCILLATIONS

(Physics - Complementary Course)

(2019 Admission onwards)

Time : 2.00 Hours   Maximum : 60 Marks

Credit : 2

Part A (Short answer questions)

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

1. What are different types of frames of reference?

2. Cyclones do not occur at the equator. Explain.

3. Define conservative force. Give two examples.

4. The C-frame is called zero reference frame. Explain.

5. What is central force? Give one example.

6. What are Lorentz transformation equations?

7. Define proper time.

8. Write down the variation of mass the velocity and explain the symbols.

9. Write down the mass energy relation and explain the symbols.

10. Light is a transverse wave. Explain.

11. What is stopping potential?

12. Explain the uncertainty principle.

(Ceiling: 20 Marks)

Part B (Short essay questions - Paragraph)

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

13. What is potential energy curve? Explain potential well.

14. Show that in the absence of external forces total linear momentum is always conserved.

15. Define Simple harmonic motion. Derive differential equation of SHM and find its solution.

16. Write a short note on Anharmonic oscillator and free oscillations.

17. Sun radiates energy at a rate of 3.8*10 $^{-26}$ W. What is the intensity of solar radiation incident on the earth while it is 1.5x10 ^{11}m away from the sun.

18. Explain ultraviolet catastrophe. What was the result of this discrepancy?

19. An eigen function of the operator $\frac{d^2}{dx^2}$ in wavefunction $\phi = e^{-2x}$. Find the corresponding eigen value.

(Ceiling: 30 Marks)

Part C (Essay questions)

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

20. What are fictious forces in a non-inertial frame. Derive the expressions for the same.

21. Describe Michelson-Morely experiment and explain the significance of the null results obtained.

(1 × 10 = 10 Marks)

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