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K19U 3193

Reg. No.	:	
Name :		

I Semester B.Sc. Degree (CBCSS- Supplementary / Improvement)

Examination, November-2019

(2014- 2018 Admissions)

CORE COURSE IN PHYSICS

1B01 PHY: PHYSICS PRIMERS

Time: 3 Hours Max. Marks: 40

Write answers in English only

SECTION - A

- Answer ALL Very short answer type Each question carries ONE mark. (4x1=4)
 - 1. Vectors \vec{A} and \vec{B} are such that $|\vec{A}+\vec{B}=|\vec{A}-\vec{B}|$. Then the angle between them is____.
 - 2. Quantum theory of radiation was proposed by_____
 - 3. A vector which satisfies the condition $\nabla \times \vec{E} = 0$ is _____.
 - 4. A wave which requires a medium for their propagation is called_____

SECTION -B

- II. Answer any seven Short Answer Type- Each question carries Two marks.
 (7x2=14)
 - 5. State stoke's theorem?
 - 6. State plank's quantum hypothesis.
 - Represent graphically the variation of kinetic energy, potential energy and total energy with displacement of particle executing simple harmonic motion

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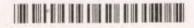
- 8. Define null vector and give 2 properties of it.
- 9. State the postulates of special theory of relativity.
- 10. What are Lissajous figures?
- 11. Distinguish between phase velocity and group velocity.
- 12. What are the conditions of applicability of Fourier theorem.

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- 13. What is scalar triple product?
- 14. Write a note on Expanding Universe.

SECTION -C

- III. (Answer any four short Essay / problem type Each question carries Three marks) (4x3=12)
 - 15. What is simple harmonic motion? Derive an expression for it.
 - 16. A tuning fork of frequency 512 Hz produced a plane wave in air having amplitude 0.5 x 10⁻³ mm. Calulate the energy density and intensity of the wave. (Velocity of sound in air 332m/s and density of air = 1.29 kg/m³)
 - 17. A particle is moving in a straight line with simple harmonic motion, its velocity has the values 3 m/s and 2 m/s when its distance from the mean position is 1 m and 2 m respectively. Find the time period of motion.
 - 18. Prove that div curl (F)=0.
 - 19. Derive the differential equation of wave motion in one dimension.
 - 20. Prove that the given vectors $\vec{A} = i + 4j + 3k$ and $\vec{B} = 4i + 2j 4k$ are perpendicular to each other.



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SECTION -D

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- IV. Answer any Two- Long essay type- Each question carries Five marks (2x5=10)
 - 21. Obtain the transformation and reverse transformation equations between Cartesian co-ordinates and Spherical polar co-ordinates.
 - 22. Derive an expression for the velocity of transverse wave in a stretched string.
 - 23. What is meant by standard model in high energy physics? What are the various particle families in the standard model? Explain Higgs mechanism.
 - 24. Derive an expression for the time period of a compound pendulum.