0021930

Reg. No. : .....

Name : .....

K19U 3194

I Semester B.Sc. Degree (CBCSS- Supplementary /Improvement) Examination, November-2019

(2014 -18 Admissions)

COMPLEMENTARY COURSE IN PHYSICS

1C01 PHY : MECHANICS

Time : 3 Hours Max. Marks : 32

Instruction: Answer the questions English only

SECTION-A

I. (Very short answer type - each carries **1** marks - answer all **5** questions) **(5×1=5)**

1. The young's modules for air is-------?
2. The unit of energy current is----?
3. According to deBroglie hypothesis the momentum P is given by--?
4. Which metal is used as target in Davisson - Germer experiment?
5. Give the relation between the angular frequency ω, wave vector k and velocity v?

SECTION-B

II. (Very short answer type- each carries **2** marks- answer **4** questions. out of **6**) **(4×2=8)**

6. Define Poisson's ratio? What are its theoretical limiting values?
7. Represent graphically the variation of kinetic energy, potential energy and total energy versus displacement?

P.T.O.

8. Explain how stationary or standing waves defer from ordinary progressive waves?

9. What are the admissibility conditions of a wave function?

10. What is uncertainty principle?

11. Write down an expression for energy density and explain the symbols?

SECTION-C

III. (Short essay/problem type-each carries **3** marks-answer **3** questions out of **5**) **(3×3=9)**

12. Calculate the Poisson's ratio for aluminium, given $Y = 7\times10^{10}$ Pa and Rigidity modulus $= 2.5\times10^{10}$ Pa?

13. Obtain the wave function for a particle inside a box of Length L using Schrodinger equation?

14. Show that the radii of gyration of a circular disc and circular ring of same radius about a tangential axes are in the ratio $\left(\frac{5}{6}\right)^{1/2}$.

15. Find the period of oscillation and maximum acceleration of simple harmonic motion represented by the equation $X = 2Sin\left(\Pi t + \frac{\Pi}{2}\right)$?

16. Show that average kinetic energy per unit volume over a time period is equal to one half of the total energy?

SECTION-D

IV. (Long essay type-each carries **5** marks-answer **2** questions out of **4**) **(2×5=10)**

17. What are forced vibrations? Give mathematical theory of the phenomena of forced vibration and resonance? Discuss the phenomena known as"Sharpness of resonance"?

18. Describe with necessary theory how you would determine the rigidity modulus of as wire experimentally by using torsion pendulum?

19. Define moment of inertia? Find the moment of inertia of a solid cylinder of radius r and length about an Axis through its centre of gravity and perpendicular to the axis of the cylinder?

20. What is meant by wave function? Derive Schrodinger's one dimensional time dependent equation?