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JAR-003-001102 Seat No. _____

B. Sc. (Sem. I) (CBCS) Examination

December - 2019

Physics - 101

(Mechanics, Elasticity & Modern physics)

(Old Course)

Faculty Code : 003

Subject Code : 001102

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions : (1) All questions are compulsory.

(2) Symbols have their usual meaning.

(3) Figures on right side indicates marks.

1 Answer the following Questions in short : **20**

(1) Write unit of angular momentum.

(2) Who had given correspondence principle?

(3) Write about black body radiation.

(4) Bulk modulus is related with _____ strain. (fill in the blank)

(5) Efficiency of maximum power transfer is _____% (fill in the blank)

(6) A voltmeter should have _____ resistance. (fill in the blank)

(7) The magnitude of Poisson's ratio is _____. (fill in the blank)

(8) What is escape velocity ?

(9) What is weightlessness?

(10) Define stress.

(11) Define strain.

(12) Define constant current source.

(13) What is phase?

(14) The unit of modulus of rigidity is same as _____. (fill in the blank)

(15) Write about principle quantum no.

(16) If speed of rotation increase, moment of inertia _____. (fill in the blank)

(17) 01 Horse Power = _____ watt. (fill in the blank)

(18) The Young's modulus depends on _____ of the material. (fill in the blank)

(19) The average value of alternating voltage over a period is _____. (fill in the blank)

(20) Acceleration due to gravity can be expressed by the relation _____. (fill in the blank)

2 (A) Answer the following : (Any **Three**) **6**

(1) Explain Bulk modulus.

(2) States Hook's Law

(3) Briefly write about satellites

(4) Write about law of conservation of energy.

(5) What is torque?

(6) Explain : work done by conservative force along a closed path is always zero.

(B) Attempt any **three** : **9**

(1) Write about Poisson ratio.

(2) Derive the formula of gravitational potential energy of uniform sphere.

(3) Prove work energy thermo.

(4) Write Kepler's Law of planter motion.

(5) Explain the law of conservation of linear momentum.

(6) Define the relation between angular momentum and torque acting on the body.

(C) Attempt any **two** : **10**

(1) What is elastic collision and in-elastic collision?

(2) Write about moment of inertia of rectangle and moment of inertia of ring.

(3) Determination of Young's Modulus by Searl's Method.

(4) State and prove the theorems of moment of inertia.

(5) Derive the formula of potential and field due to a solid sphere

(a) at a point outside the sphere and

(b) at a point on the surface of the sphere.

3 (A) Answer the following : (Any **Three**) **6**

(1) Explain the spin quantum number

(2) What is De-Broglie hypothesis ? State its equation.

(3) Explain Compton effect.

(4) What is cycle and frequency for AC currents ?

(5) Write use of Multimeter.

(6) What is chassis and ground for networks ?

(B) Attempt any **three** : **9**

(1) Explain He What Heisenberg's uncertainty principle ?

(2) Write about wave mechanical atom model.

(3) What is electron spin?

(4) Explain about space quantization.

(5) Derive equation of current for LCR series a.c. circuit

(6) Explain Maximum power Transfer Theorem.

(C) Attempt any **two** : **10**

(1) Prove that phase velocity is equal to group velocity.

(2) Explain Nortan's theorem.

(3) Explain vector atom model.

(4) State the correspondence principle and prove it for the frequency of spectral line.

(5) Derive an expression of growth of charge for series R-C dc circuit.
