B.Sc. DEGREE EXAMINATION, APRIL 2018.

I YEAR I SEMESTER

Core Major - Paper I - PROPERTIES OF MATTER

Time : 3 Hours Max. Marks :60

SECTION A – (10 × 1 = 10 marks)

(Q. No. 1-12)Answer any *TEN* questions

1. State Newton's law of gravitation.
2. Define gravitational potential.
3. The modulus of rigidity and Poisson's ratio of the material of a wire are 2.87x1010 N/m2 and 0.379 respectively. Find the value of Young's modulus of the material of the wire.
4. Steel is more elastic than rubber. Justify.
5. Find the work done in stretching a wire of 1 sq mm cross section and 2 m long through 0.1 mm. (Young's modulus =2x1011 N/m2).
6. What are torsioal oscillations?
7. Why needle floats on water surface? Give reason.
8. Define sphere of influence.
9. Give the dimension of coefficient of viscosity.
10. What do you mean by velocity gradient?
11. State Hooke's law.
12. What is streamline flow?

SECTION B – (5 × 4 = 20 marks)

(Q. No. 13-19)Answer any *FIVE* questions

1. Explain how the acceleration due to gravity varies with altitude and depth.
2. Obtain an expression for the bending moment of a beam.
3. Calculate the work done in twisting a steel wire of radius 10-3 m and length 0.25 m through an angle of 45. Given rigidity modulus of the wire is 8x1010 N/m2
4. Why the surface tension of liquid decrease, with the increase in the temperature? Explain.
5. Discuss the applications of viscosity.
6. Derive an expression for the rigidity modulus of a wire.
7. Discuss Jae gear’s method.

SECTION C – (3 × 10 = 30 marks)

(Q. No. 20-24)Answer any *THREE* questions

1. Describe Boy's method for determining the value of gravitational constant.
2. Describe Koenig’s method to determine the Young’s modulus of a bar.
3. Describe static torsion method to determine the rigidity modulus of the rod.
4. Derive an expression for the excess of pressure inside a curved surface.
5. Give Poiseulle's method for measuring the coefficient of viscosity of a liquid. Derive the formula used with its two correciton terms.