

**Avinashilingam Institute for Home Science and Higher Education for Women
Coimbatore – 641 043**

**Bachelor's Degree Examination – November 2017
I Semester**

**Class: I UG
Major: Physics**

**Time: 3 hrs.
Max Marks: 100**

15BPHC01 Properties of Matter

Part - A

Choose the correct answer

(10×1=10)

1. F/A is called as -----
a. stress b. strain c. Poisson's ratio d. torque
2. Poisson's ratio is always a ----- quantity.
a. negative b. positive c. positive or negative d. fixed
3. If the velocity is greater than the critical velocity, then the motion is known as ----- motion.
a. streamlined b. standard c. Turbulent d. normal
4. An example for highly viscous liquid is -----.
a. water b. kerosene c. coconut oil d. castor oil
5. The unit for surface tension is -----.
a. force / metre b. force .metre
c. metre/ sec d. metre / sec²
6. The excess of pressure inside a spherical soap bubble is $p =$ -----.
a. $4\sigma/r$ b. $2\sigma/r$ c. σ/r d. r/σ
7. According to Kepler's third law of planetary motion, T^2 is proportional to -----.
a. a b. a^2 c. a^3 d. a^4
8. The expression for variation of 'g' with depth is $g' =$
a. $g (1-h/r)$ b. $g (1+h/r)$ c. $g (1* h/r)$ d. $g (h/r)$
9. At the freezing point, a liquid is in equilibrium with its solid and their vapor pressures are -----.
a. zero b. equal c. constant d. unity.
10. ----- diffuse faster than colloids.
a. solutes b. layers c. crystalloids d. solvents

Part B

5X6=30

Answer the Following

Answer should not exceed 400 words or two pages

11. a. (i) Define and get an expression for rigidity modulus. (4)
(ii) Define: Poisson's ratio. (2)
(or)
11. b. Obtain an expression for the bending moment.
12. a. Discuss about the Stokes's method for the coefficient of viscosity of a viscous liquid.
(or)
12. b. Get the correction for pressure head for Poiseuille's formula.

13. a. Write a note on Venturimeter.

(or)

13. b. Define: (i) Surface tension

(ii) Surface energy

(iii) Interfacial surface tension

14. a. State and explain the Newton's law of Gravitation.

(or)

14. b.(i) Define and give an expression for escape velocity.

(ii) Explain the principle of rocket.

15.a. Describe the Berkeley and Hartley method for the determination of Osmotic pressure.

(or)

b. State and explain the Fick's laws of Diffusion.

Part C

5x12=60

Answer the following

Answer should not exceed 800 words or four pages

16.a.(i) Get an expression for the work done in twisting a wire.

(ii) How can you determine the rigidity modulus by static torsion method?

(or)

16.b. Explain the determination of 'q' in non- uniform bending by Koenig's method.

17.a. Write a note on Rankine's experiment for the measurement of viscosity of a gas.

(or)

17.b. Give the necessary theory and experiment for the Searle's viscometer.

18.a. Describe the drop weight method for the determination of surface tension of a liquid.

(or)

18.b. Give the principle, apparatus, experiment and advantages of Jaeger's method for the determination of surface tension.

19.a. Discuss about the variation of 'g' with (i) latitude and (ii) altitude

(or)

19.b.(i) What is known as Compound pendulum?

(2)

(ii) Find the period of oscillation of a compound pendulum.

(8)

(iii) What do you mean by equivalent simple pendulum?

(2)

20.a. Describe about the elevation of boiling point of a solution.

(or)

20.b. Write a note on

(i) Experimental determination of diffusivity

(ii) Differential equation for Diffusion.
