18PHU02

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2018
(First Semester)

Branch-PHYSICS

PROPERTIES OF MATTER AND SOUND

Time: Three Hours Maximum: 75 Marks

SECTION-A (10 Marks!
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 x 1 = 10)

Choose the maximum value of poisson's ratio is .
(i) 1 (ii) oo
(iii) 0 (iv) 0.5

The moment of restoring couple is called-.
(i) Youngsmodulus (ii) Flexural rigidity
(iii) Bending moment (iv) Rigiditymodulus

Find the dimensional formula for coefficient of viscosity is .
(i) ML^T'1 (ii) ML'T'
(iii) ML'T (iv) ML'1 T1

4 Identify the value of osmotic pressure depends on.
(i) Natural of the salt (ii) Concentration of solution
(iii) Temperature of solution (iv) All the above

Mention the concave liquid surface, the resultant force of surface tension on a molecule is
(i) Outward (ii) Inward
(iii) Zero (iv)Infinity

6 Indicate the angle of contact of mercury is.
(i) Zero (ii) Actue
(iii) Obtuse (iv) Rightangle

Find the natural frequency of a simple pendulum is
(i) n= I |? ....I IT
2IT
(ii) $n=\frac{}{2\Pi\sqrt{g}}$
(iii) n: =J_ IT
21
(iv) $n=\frac{1}{2l}\sqrt{\frac{M}{T}}$

Define Doppler effect in sound is
(i) Symmetric (ii) Asymmetric
(iii) Zero (iv) Constant

Piezo - electric oscillator can produce a frequency range of
(i) 5x10s HZ (ii) 5x10° HZ
(iii) 5x10^4 HZ (iv) 5xl0^{10}HZ

10 Indicate the reverberation time depends on the
(i) Size of the room (ii) Nature of the reflecting material
(iii) Area of reflecting surfaces (iv) All the above

SECTION - B (35 Marks)

Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 7 = 35)

11 a A metal disc of 0.1m radius and mass 1 kg is suspended in a horizontal plane by a vertical wire attached to its centre. If the diameter of the wire is $10'^{3}$m, its length lm and the period of torsional oscillations is 4 seconds calculate the rigidity modules of the wire.

b Analyze the expression for bending moment.

12 a Explain about ostwalds ' s viscometer.

OR

b Describe the osmosis and vapour pressure of a solution.

13 a Compare the surface tensions of two liquids at the same temperature by Jaegar's method.

OR

b Show that the excess of pressure inside a spherical drop equal of 2T/r.

14 a Outline the properties of longitudinal waves.

OR

b How closed end organ pipe produce odd harmonics only and open end organ pipe produce all the harmonics.

15 a Summarize the Applications of ultrasonics.

OR

b Enumerate the features that an auditorium should have for good acoustics.

SECTION -C (30 Marks)

Answer any **THREE** Questions
ALL Questions Carry **EQUAL** Marks (3 x 10 = 30)

16 Examine the concept of bending of beams for the determination of young's modulus of a beam by cantilever loading.

17 Analyze the result, the coefficient of viscosity is independent of pressure of the gas by Rankine's method.

18 Discuss about the excess pressure in liquid drops and air bubbles.

19 Discuss Doppler effect in sound and obtain an expression for the apparent frequency of the note when (i) Observer at rest and source in motion, (ii) Source at rest and observer in motion.

20 Explain in detail production of ultrasonic by Piezo-electric oscillator.

Z-Z-Z END