

SASMIRA'S INSTITUTE OF MAN-MADE TEXTILES

An Autonomous Institute

Nov/Dec. 2015 ExaminationDIPLOMA COURSE IN MAN-MADE TEXTILE TECHNOLOGY/
TEXTILE CHEMISTRY/KNITTING TECHNOLOGY
(DMTT / DMTC / DKT)**I Semester (Scheme – 2)**

(Time Allowed - 3 hours)

(Marks – 80)

BASIC PHYSICS

- Instructions:**
1. All Questions are compulsory.
 2. Figure to the right indicate full marks.
 3. Use separate Answer Books for Section-I & Section-II.
 4. Illustrate your answer with neat sketches wherever necessary.
 5. Assume suitable additional data, if necessary.

SECTION – I

- | | Marks |
|--|--------------|
| 1. Attempt any six. | 12 |
| <ol style="list-style-type: none">a) Define physical quantity and absolute error.b) State triangle law of vectors and polygon law of vectors.c) Mention any two fundamental quantities along with their S.I. unit.d) Define tensile stress and tensile strain.e) Define cohesive force and adhesive force.f) Draw a neat labelled diagram of Poisseullies apparatus.g) A wire of length of 2 m is elongated through 2×10^{-3} m. Find longitudinal strain developed.h) A liquid rises to a height of 6 cm in a capillary tube of radius 0.06 cm. How far will it rise in a capillary tube of radius 0.02 cm?i) State any two rules of significant figures. | |
| 2. Attempt any four. | 16 |
| <ol style="list-style-type: none">a) State and explain the rules for use of SI system.b) State and explain with examples, the rules for approximation.c) State parallelogram law of vectors and derive with usual notation $R^2 = P^2 + Q^2 + 2PQ \cos \theta$d) Define bulk modulus of elasticity and show that $K = \frac{F}{A} \times \frac{V}{dV}$ with usual notation.e) With a neat labelled diagram, explain how you will determine 'Y' by using Searle's apparatus.f) A wire of radius 2×10^{-3} m and length 2 m extends by 2×10^{-3} m when a force of 20 N is applied. Find tensile stress, tensile strain and 'Y'. | |

Marks**3. Attempt any two.****12**

- Give 5/6 examples of the phenomena of surface tension in daily life.
- State and explain Newton's law of viscosity and hence define coefficient of viscosity and One Poise.
- A capillary tube of radius 0.05 cm is dipped in water. The water rises through 5 cm. Calculate surface tension of water. Take $\theta = 0^\circ$, $g = 980 \text{ cm/s}^2$ and density of water $\rho = 1 \text{ gm/cm}^3$
 - A steel ball of radius 0.02 cm falls through water with a terminal velocity of 10 cm/s. Find coefficient of viscosity of water if density of material of spherical ball is 1.5 gm/cm^3 and that of water is 1 gm/cm^3

SECTION –II**4. Attempt any six.****12**

- State - (i) Boyle's law (ii) Charle's law.
- Why C_P is greater than C_V ? Explain.
- Define – (i) Absolute humidity (ii) Specific humidity.
- Dew point on a certain day was 14°C . Calculate R.H. if SVP of $14^\circ\text{C} = 10.46 \text{ mm of Hg}$ and SVP at $16^\circ\text{C} = 14.12 \text{ mm of Hg}$.
- Define the term - (i) Frequency (ii) Period.
- Shot that $v = n\lambda$
- A body produces waves of wavelength 33 cm. What is the frequency of vibration, if the velocity of propagation is 330 m/sec?
- Write Sabine's formula and give the meaning of symbol used.

5. Attempt any four :**16**

- What is Absolute Zero of temperature? And how Kelvin's scale of temperature obtained from it?
- Obtain the general gas equation i.e. $PV = KT$.
- For a certain gas the difference between it specific heats is $140 \text{ J/Kg}^\circ\text{K}$. The ratio of $\frac{C_P}{C_V}$ is equal to 1.2. Find the Specific Heats.
- Define Relative Humidity and obtain the expression for determination of Relative Humidity.
- Explain the construction and working of chemical hygrometer.
- Give the applications of humidity in textile.

6. Attempt any two :**12**

- State the expressions for velocity & acceleration of particle in S.H.M.
 - What are free and forced vibrations?.
- State any three characteristics of transverse waves.
 - A particle perform S.H.M.. Its acceleration is 4.5 cm/sec^2 when it is 8 cm from mean position, calculate its period.
- Distinguish between Echo and Reverberation
 - A lecture hall has a total surface absorption 180. The reverberation time calculated is 3.55 sec. Find volume of the hall.