

GUJARAT TECHNOLOGICAL UNIVERSITY

DI -1 SEMESTER – OLD PAPER – W24 TO S25 – QUESTION BANK(English)

Subject Name & Code:

Applied Physics- DI01000121

Unit 1: Units and Measurements

Repeated Questions:

1. **List the fundamental physical quantities of the SI measurement system along with their units.**
 - Appeared in: W24 (Q2-A2, 03 marks), S25 (Q2-A1, 03 marks)
2. **Calculate the least count of a micrometer screw gauge.**
 - Appeared in: W24 (Q2-A1, 03 marks), S25 (Q3-A1, 03 marks)
3. **Write a short note on Types of Errors.**
 - Appeared in: S25 (Q2-B1, 04 marks), S25 (Q3-B1, 04 marks)

Other Important Questions:

4. **Explain methods to measure the dimensions of a given object by using relevant instruments.**
 - Appeared in: S25 (Q1-3, 01 mark)
5. **Draw a labeled diagram of vernier caliper.**
 - Appeared in: W24 (Q2-B1, 04 marks)
6. **The main scale of Vernier calipers is calibrated in mm. Its 19 divisions of the main scale are equal to 20 divisions of the Vernier scale. Find its Least Count.**
 - Appeared in: S25 (Q3-A1, 03 marks)
7. **In an experiment, the values of refractive indices of water were found to be 1.31, 1.32, 1.33, 1.34 and 1.35. Find (i) relative error (ii) Percentage error.**
 - Appeared in: S25 (Q3-B1, 04 marks)
8. **Fill in the blanks from the given options (Unit 1 Related):**
 - _____ is a derived unit of SI measuring system (joule, kilogram, meter)
 - Appeared in: W24 (Q1-1, 01 mark)
 - 0.034 has _____ significant figures. (1, 2, 3)
 - Appeared in: W24 (Q1-3, 01 mark)
 - ----- is a fundamental physical quantity. (Time, Velocity)
 - Appeared in: S25 (Q1-2, 01 mark)
 - Depth of a beaker is measured by---- (Vernier calipers, Micrometer screw gauge)
 - Appeared in: S25 (Q1-3, 01 mark)

Unit 2: Circular Motion

Repeated Questions:

1. **Explain banking of roads.**
 - Appeared in: W24 (Q2-B2, 04 marks), S25 (Q2-B2, 04 marks)
2. **State examples of centripetal and centrifugal force.**
 - Appeared in: W24 (Q3-A1, 03 marks), S25 (Q1-4, 01 mark)
3. **Obtain the formula of centripetal force.**
 - Appeared in: W24 (Q2-A3, 03 marks), S25 (Q3-B2, 04 marks)

Other Important Questions:

4. **Explain the impulse of force with necessary examples.**
 - Appeared in: W24 (Q2-B3, 04 marks)
5. **Define Impulse of force and discuss any one application of it.**
 - Appeared in: S25 (Q2-A2, 03 marks)
6. **By applying a force on an object of 5 kg mass, its velocity increases from 2 m/s to 3.5 m/s in 2 second. Find applied force.**
 - Appeared in: S25 (Q3-A2, 03 marks)
7. **Fill in the blanks from the given options (Unit 2 Related):**
 - _____ acts towards the center. (Centripetal force, Centrifugal force)
 - Appeared in: S25 (Q1-4, 01 mark)
 - kg m s^{-1} is the unit of _____ (linear momentum, force)
 - Appeared in: S25 (Q1-5, 01 mark)

Unit 3: General Properties of Matter

Repeated Questions:

1. **Explain Hooke's Law for elasticity.**
 - Appeared in: W24 (Q1-9, 01 mark), S25 (Q2-A3, 03 marks)
2. **Define Stress and explain types of stress.**
 - Appeared in: W24 (Q3-A3, 03 marks), S25 (Q2-B3, 04 marks)
3. **Explain surface tension, cohesive and adhesive forces.**
 - Appeared in: W24 (Q3-A2, 03 marks), W24 (Q4-A1, 03 marks), S25 (Q3-A3, 03 marks)
4. **Explain Laplace's molecular theory.**
 - Appeared in: W24 (Q3-B3, 04 marks), S25 (Q4-B1, 04 marks)
5. **Explain Reynold's Number and its significance.**
 - Appeared in: W24 (Q4-A2, 03 marks), S25 (Q3-B3, 04 marks)

Other Important Questions:

6. **Discuss the stress-strain diagram for elasticity.**
 - Appeared in: W24 (Q3-B2, 04 marks)
7. **Water rises up to 1.6 cm in a capillary tube of radius 0.0009 m immersed vertically in water. Calculate the surface tension of water. (Take $g = 9.8 \text{ m/s}^2$, density of water = 1000 kg/m^3 , angle of contact $\theta = 0^\circ$)**
 - Appeared in: W24 (Q3-B1, 04 marks)
8. **Explain applications of Viscosity.**
 - Appeared in: S25 (Q4-A1, 03 marks)
9. **Fill in the blanks from the given options (Unit 3 Related):**
 - _____ is an elastic material (Rubber, Glass, Plastic)
 - Appeared in: W24 (Q1-6, 01 mark)
 - If the original length of spring is $l = 5 \text{ cm}$ and change in length $\Delta l = 2 \text{ cm}$, _____ is the longitudinal strain of spring. (0.8, 0.4, 0.1)
 - Appeared in: W24 (Q1-11, 01 mark)
 - The unit of Stress is same as unit of -----(power, pressure)
 - Appeared in: S25 (Q1-6, 01 mark)
 - Inverse of ----- is called compressibility. (Young Modulus, Bulk Modulus)
 - Appeared in: S25 (Q1-7, 01 mark)
 - Force between like molecules is known as-----force. (Cohesive, Adhesive)

- Appeared in: S25 (Q1-8, 01 mark)
- **Water flowing from a waterfall is an example of _____ flow. (steady, laminar, turbulent)**
 - Appeared in: W24 (Q1-4, 01 mark)

Unit 4: Heat and Thermometry

Repeated Questions:

1. **Explain heat conduction and heat convection, providing examples.**
 - Appeared in: W24 (Q4-B1, 04 marks)
2. **Distinguish between good and bad conductors of heat.**
 - Appeared in: W24 (Q4-B2, 04 marks), S25 (Q4-A2, 03 marks)
3. **State the principle, advantages and disadvantages of a mercury thermometer.**
 - Appeared in: W24 (Q4-B3, 04 marks), S25 (Q5-B1, 04 marks)

Other Important Questions:

4. **Convert the temperature 473 K to Fahrenheit unit.**
 - Appeared in: W24 (Q4-A3, 03 marks)
5. **Define Modes of heat transfer: a) Conduction b) Convection c) Radiation.**
 - Appeared in: S25 (Q4-A2, 03 marks)
6. **Explain Heat Capacity and Specific heat.**
 - Appeared in: S25 (Q4-B2, 04 marks)
7. **A person has a fever of 101. Which temperature scale is used here? Convert this temperature into the other two units.**
 - Appeared in: S25 (Q5-A1, 03 marks)
8. **Fill in the blanks from the given options (Unit 4 Related):**
 - **In SI system, temperature is measured in _____ (celsius, kelvin, fahrenheit)**
 - Appeared in: W24 (Q1-2, 01 mark)
 - **The specific heat depends on _____ (mass of material, type of material, length of material)**
 - Appeared in: W24 (Q1-8, 01 mark)
 - **SI unit of heat energy is _____. (erg, calorie, joule)**
 - Appeared in: W24 (Q1-12, 01 mark)
 - **1 Kcal = _____ J (4.186, 4186)**
 - Appeared in: S25 (Q1-9, 01 mark)
 - **100 °C = _____ °F (212, 312)**
 - Appeared in: S25 (Q1-10, 01 mark)
 - **The planet earth loses heat mainly by _____ (Conduction, Radiation)**
 - Appeared in: S25 (Q1-11, 01 mark)

Unit 5: Waves, Ultrasonics and Semiconductors

Repeated Questions:

1. **Distinguish between Longitudinal and Transverse waves.**
 - Appeared in: W24 (Q5-B1, 04 marks), S25 (Q4-B3, 04 marks)
2. **State applications of ultrasonic waves.**
 - Appeared in: W24 (Q5-B2, 04 marks), S25 (Q5-A3, 03 marks)
3. **Distinguish between P-Type and N-Type Semiconductor.**
 - Appeared in: W24 (Q5-B3, 04 marks), S25 (Q5-B3, 04 marks)

Other Important Questions:

4. **Define frequency and wavelength of a wave.**
 - Appeared in: W24 (Q5-A1, 03 marks)
5. **If the time period of a wave is 10 second, _____ is the frequency of the wave. (5 Hz, 0.1 Hz, 1 Hz)**
 - Appeared in: W24 (Q1-7, 01 mark)
6. **Sound wave is an example of _____ wave. (transverse, longitudinal, electromagnetic)**
 - Appeared in: W24 (Q1-13, 01 mark)
7. **Sound waves having frequency less than 20 Hz are known as _____ wave. (ultrasonic, audible, infrasonic)**
 - Appeared in: W24 (Q1-14, 01 mark)
8. **The volume of a hall is 9000 m³, and the total sound absorption by its surfaces is 1000 O.W.U. Calculate its reverberation time.**
 - Appeared in: W24 (Q5-A2, 03 marks)
9. **If the velocity of sound is 340 m/s and its wave length is 2 cm, then find out frequency of sound.**
 - Appeared in: W24 (Q5-A3, 03 marks)
10. **Explain N-type semiconductor with figure.**
 - Appeared in: W24 (Q5-B3, 04 marks)
11. **Obtain the relation between velocity, wavelength and frequency of a wave.**
 - Appeared in: S25 (Q4-A3, 03 marks)
12. **Write Sabine's formula for Reverberation time and state the name of the symbols.**
 - Appeared in: S25 (Q5-A2, 03 marks)
13. **State Common Acoustical Defects and their remedies.**
 - Appeared in: S25 (Q5-B2, 04 marks)
14. **Fill in the blanks from the given options (Unit 5 Related):**
 - _____ is a vector quantity. (Speed, Velocity, Mass).
 - Appeared in: W24 (Q1-10, 01 mark)
 - Sound waves are ----- (Longitudinal, Transverse)
 - Appeared in: S25 (Q1-12, 01 mark)
 - -----gave the formula of reverberation time.(Sabine, Newton)
 - Appeared in: S25 (Q1-13, 01 mark)
 - At 0 K temperature, intrinsic semiconductor behaves like---(Insulator, Conductor)
 - Appeared in: S25 (Q1-14, 01 mark)
