

**A.D.PATEL INSTITUTE OF TECHNOLOGY
INTERNAL TEST
PHYSICS**

DATE: 22/09/2008

TIME: 8 AM-9 AM

MAXIMUM MARKS: 20

NOTE:

- 1] Marks to the left indicate the full maximum marks.
- 2] Assume data wherever necessary and mention your assumptions.
- 3] Draw relevant diagrams wherever necessary.

Q-1 Answer the following questions: **(08)**

- 1** What is timbre?
- 2** If the intensity level of sound alters by 1 db, what will be % change in intensity of sound?
- 3** Ultrasonic wave can travel long distance due to its
(a) high frequency (b) high intensity
(c) high wavelength (d) None of the above
- 4** Piezoelectric effect is observed in material like
(a) iron (b) lead (c) quartz (d) NaCl
- 5** Audible limit of sound for human lies between
(a) 20 Hz to 20 MHz (b) 10 Hz to 3.2 KHz
(c) 20 Hz to 20 KHz (d) None of the above
- 6** Give any two applications of ultrasonic in material processing.
- 7** Give the materials used for LED.
- 8** Draw V-I characteristic of PN junction diode.

Q-2 Answer **any four** of the following questions: **(08)**

- 1** What is Echelon effect? Give the remedies for optimum reverberation time.
- 2** What is piezoelectric effect and magnetostriction effect?
- 3** Give the difference between zener effect and avalanche effect.
- 4** Explain any two methods ultrasonic detection.
- 5** Explain varactor diode.

Q-3 Answer **any two** of the following: **(04)**

- 1** What is the resultant intensity level when 60 db sound is added to 70 db sound?
- 2** Calculate the change in reverberation time of an empty hall of volume 3398.4 m^3 with total absorption equal to 92.9 m^2 of open window, from the condition when people inside the hall raise the absorption by 185.8 m^2 of open window.
- 3** A rectangular N type germanium bar has thickness of 2 mm and width 2 mm. A current of 10 mA passes along bar and magnetic field of 0.1 tesla is applied perpendicular to the current flow. The Hall voltage developed is 1 mV. Calculate the Hall coefficient and electron density in the semiconductor. (charge electron = $1.6 \times 10^{-19} \text{ c}$)

