

- Instructions :**
- (1) All questions are compulsory.
 - (2) Illustrate your answers with neat sketches wherever necessary.
 - (3) Figures to the right indicate full marks.
 - (4) Assume suitable data, if necessary.
 - (5) Preferably, write the answers in sequential order.

1. Attempt any **NINE** of the following : [18]
- (a) A car moving with an initial speed of 54 km/hr decelerates to 25 km/hr in 9 seconds. Calculate the SOL deceleration.
 - (b) State Newton's first law of motion. Give one example.
 - (c) Define :
 - (i) Angular displacement
 - (ii) Angular acceleration
 - (d) State any two properties of ultrasonic waves.
 - (e) State any two applications of ultrasonic testing.
 - (f) Define :
 - (i) Neutral temperature
 - (ii) Inversion temperature
 - (g) State any two applications of LDR.
 - (h) State any two factors affecting thermo emf.
 - (i) State any two characteristics of thermocouple.
 - (j) State any four methods of non-destructive testing.
 - (k) A car moving with an initial velocity 90 km/hr comes to rest in 10 seconds when brakes are applied. Find the retardation value.
 - (l) The energy of a photoelectron is 2.8 eV. Calculate its wavelength (Planck's constant, $h = 6.625 \times 10^{-34}$ J-sec; speed of light, $c = 3 \times 10^8$ m/sec)
2. Attempt any **FOUR** of the following : [16]
- (a) Define the terms :
 - (i) Projectile motion
 - (ii) Trajectory
 - (iii) Angle of projection
 - (iv) Time of flight
 - (b) Explain the terms :
 - (i) Spontaneous emission and
 - (ii) Stimulated emission with reference to lasers.
 - (c) Explain production of ultrasonic waves by piezoelectric method.
 - (d) An object projected upwards making an angle of 38° with the horizontal moves with an initial speed of 60 m/sec. Calculate :
 - (i) The distance from the point of projection at which the object strikes.
 - (ii) The time taken by the object to reach ground.
 - (e) Describe how X-rays are produced by using modern Coolidge tube.
 - (f) State the necessary criteria for selecting a NDT method in practice (any four points).
3. Attempt any **FOUR** of the following : [16]
- (a) Find minimum wavelength and maximum frequency of X-rays produced by an X-ray tube working of 50 kV.
 - (b) State the three equations of motion of a body performing angular motion - along with the meaning of all symbols involved.

- (c) A vehicle covers 68 m in 6th second and 92 m in 9th second of its motion. Calculate the acceleration and the distance covered by it in 16th second of its motion.
- (d) (i) State Joule's law and write its mathematical form.
(ii) Calculate the amount of heat generated when a current of 2 Amp flows through a resistance of 6.4 Ω for 10 minutes.
- (e) State any two engineering applications and any two medical applications of laser.
- (f) State any four characteristics of photoelectric effect.

Paper Discussion Schedule for all Subject: FY Diploma Sem-II

Date	Day	Timing	Centre
9 April 2017	Sunday	9 a.m. to 11 a.m.	Dadar
9 April 2017	Sunday	12 p.m. to 2 p.m.	Thane
9 April 2017	Sunday	9 a.m. to 11 a.m.	Ghatkopar
9 April 2017	Sunday	12 p.m. to 2 p.m.	Borivali
9 April 2017	Sunday	12 p.m. to 2 p.m.	Nerul
9 April 2017	Sunday	3 pm to 5 pm	Kalyan

