

PHY: Mechanics and Solid-State Electronics (Multidisciplinary Course)**Time: 2:00 Hours****Marks: 50****Instructions:**

1. All questions are compulsory.
 2. Figures to the right indicate marks.
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- Que.1 Answer any 2 out of 3 from following questions. (10)
- (1) State and explain Newton's law of gravitation.
 - (2) Discuss Kepler's law of planetary motion.
 - (3) Explain motion of planets and satellite in circular orbit.
- Que.2 Answer any 2 out of 3 from following questions. (10)
- (1) Derive an expression for the efficiency of a half wave rectifier.
 - (2) Explaining capacitor filter, write its advantages.
 - (3) Explain use of Zener diode as voltage regulator.
- Que.3 Answer any 2 out of 3 from following questions. (10)
- (1) Explain action and working of common base N-P-N transistor.
 - (2) Explaining output characteristics of common base connection, define its output resistance.
 - (3) Describe voltage divider bias method for transistor biasing.
- Que.4 Answer any 5 out of 9 from following questions. (10)
- (1) Explain gravitational potential.
 - (2) What is gravitational field? Explain.
 - (3) Explain weightlessness.
 - (4) Write a note on semiconductor diode.
 - (5) Discuss comparison of rectifiers.
 - (6) Explain filter circuits.
 - (7) Write a note on transistor.
 - (8) Explain inherent variations of transistor parameters.
 - (9) Define Stability Factor.
- Que.5 Answer any 2 out of 3 from following questions. (10)
- (1) Derive an expression for escape velocity of a body from the surface of the earth.
 - (2) Write a note on Zener diode.
 - (3) Explain common emitter N-P-N transistor connection in detail.
