## **ANSWERS**

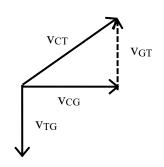
#### Q1. (20 marks)

- (a) (10 marks)  $0^2 10^2 = -2 \times 9.8 \times \text{h}$ ; h = 5.1 m
- (b) (10 marks)  $0 = \frac{1}{2}9.8t^2 10t$  t = 2.0 s

b) 
$$S = S_0 + V_0 \lambda + \frac{\lambda}{2} \alpha_1 \lambda^2$$

## Q2. (20 marks)

(a) (10 marks)



(b) (10 marks) 
$$v_{CT} = \sqrt{70^2 + 80^2} = 106 \text{ km/h}$$

### Q3. (20 marks)

- (a) (15 marks)  $a = \frac{12}{1+2+3} = 2 \text{ m/s}^2$
- (b) (5 marks)  $F P = m_1 a = 1 \times 2 = 2 N$ ; P = 10 N

#### **Lessons and CLOs**

Lecture/Chapter 01: Kinematics

Topic: Free fall

CLO1:Test your knowledge of kinematics, dynamics, and laws of conservation of a mechanical system

CLO3: Test your skills of analyzing and solving problems in science and engineering

CLO4: Test your communication skills in writing manner

# **Lecture/Chapter** 01: Kinematics

**Topic**: Relative motions

CLO1:Test your knowledge of kinematics, dynamics, and laws of conservation of a mechanical system

CLO2: Test your knowledge of applying physics to solving problems in science and engineering

CLO3: Test your skills of analyzing and solving problems in science and engineering

CLO4: Test your communication skills in writing manner

**Lecture/Chapter** 02: Laws of motion

Topic: Newton's second law

CLO1:Test your knowledge of kinematics, dynamics, and laws of conservation of a mechanical system

CLO2: Test your knowledge of applying physics to solving problems in science and

	engineering
	CLO3: Test your skills of
	analyzing and solving problems in
	science and engineering
	CLO4: Test your communication
	skills in writing manner
Q4. (20 marks)	Lecture/Chapter 02: Laws of
(a) (5 marks) $f_{\text{st max}} = \mu_{\text{st}}.N = \mu_{\text{st}}.mg = 0.5 \times 2 \times 9.8 = 9.8 \text{ N};$	motion
(b) (15 marks) $F > f_{\text{stmax}}$ : Object moves.	Topic: Friction
$f_k = \mu_k N = \mu_k mg = 0.3 \times 2 \times 9.8 = 5.9 \text{ N}$	CLO1:Test your knowledge of
The plant of 2 of of the	kinematics, dynamics, and laws of
	conservation of a mechanical
	system
	CLO2: Test your knowledge of
	applying physics to solving
	problems in science and
	engineering
	CLO3: Test your skills of
	analyzing and solving problems in
	science and engineering
	CLO4: Test your communication
	skills in writing manner
Q5. (20 marks)	Lecture/Chapter 02: Laws of
$\mathbf{v}^2$	motion
(10 marks) $T = m \frac{r}{R}$	Topic: Newton's second law;
4×1.0 0.161	uniform circular motion
(10 marks) $m = \frac{4 \times 1.0}{5^2} = 0.16 \text{ kg}$	CLO1:Test your knowledge of
	kinematics, dynamics, and laws of
	conservation of a mechanical
	system
	CLO3: Test your skills of
	analyzing and solving problems in
	science and engineering
	CLO4: Test your communication
	skills in writing manner