

COURSE NAME : EXERCISE THERAPY – I

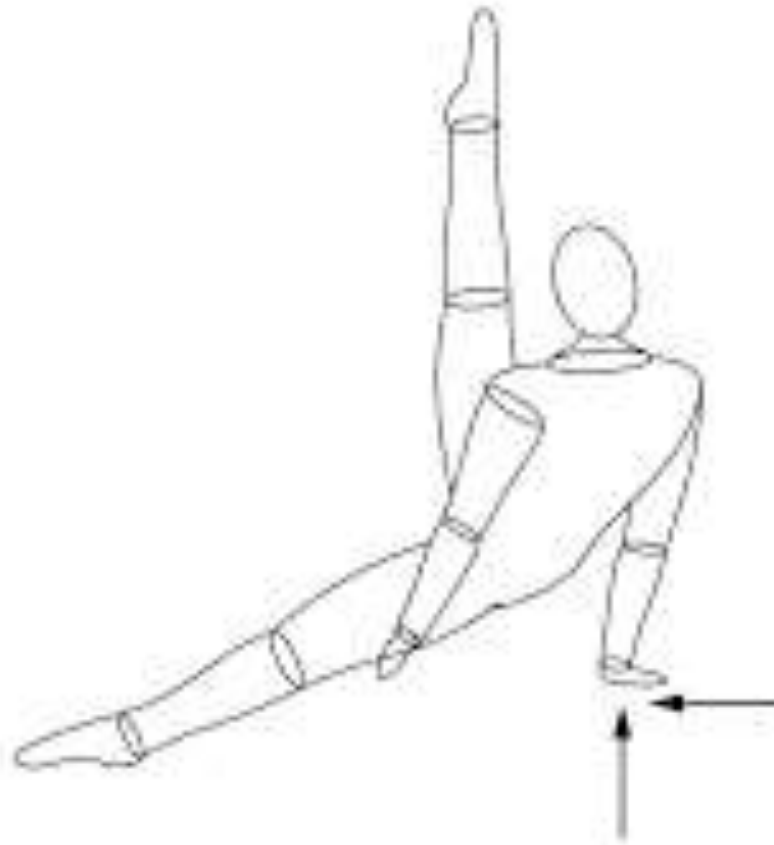
COURSE CODE : 746278

TITLE : APPLIED BIOMECHANICS – PART I

NAME : EZHILARASU T

DESIGNATION : ASSOCIATE PROFESSOR

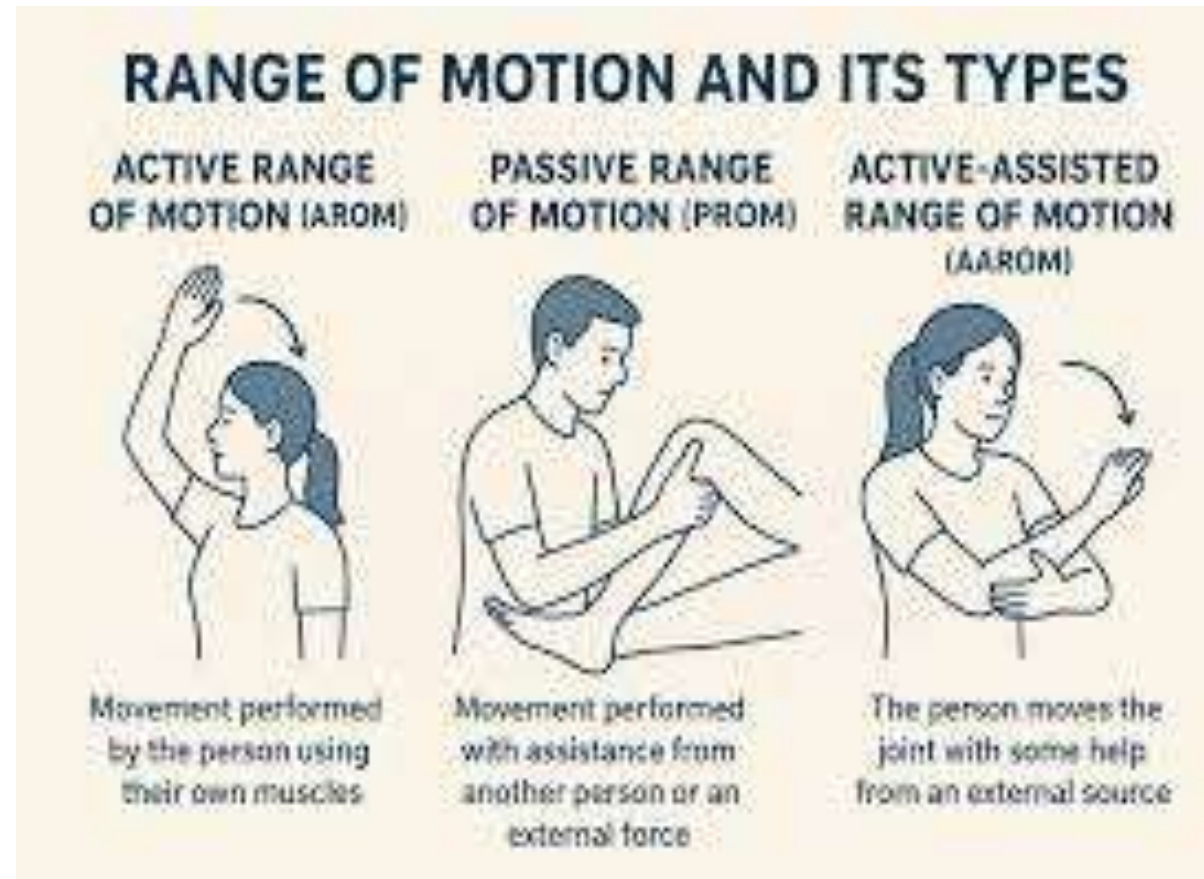
APPLIED BIOMECHANICS – PART I



ANATOMICAL MOVEMENT



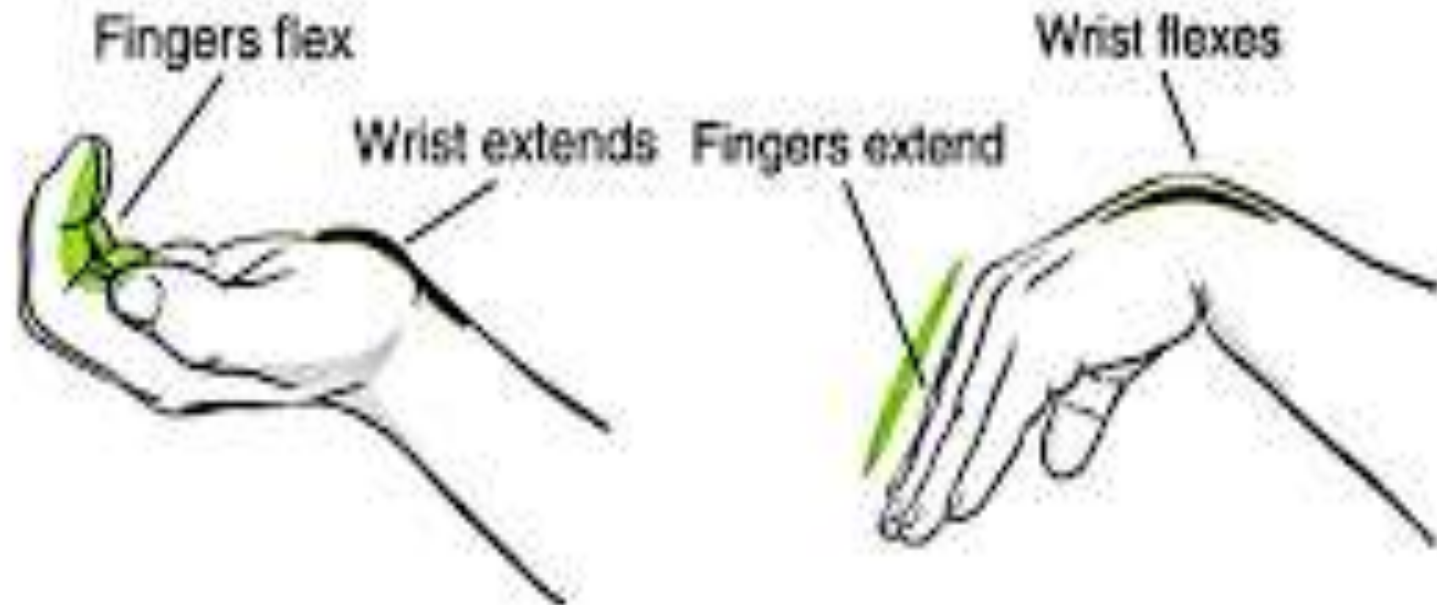
RANGE OF MOTION (ROM)



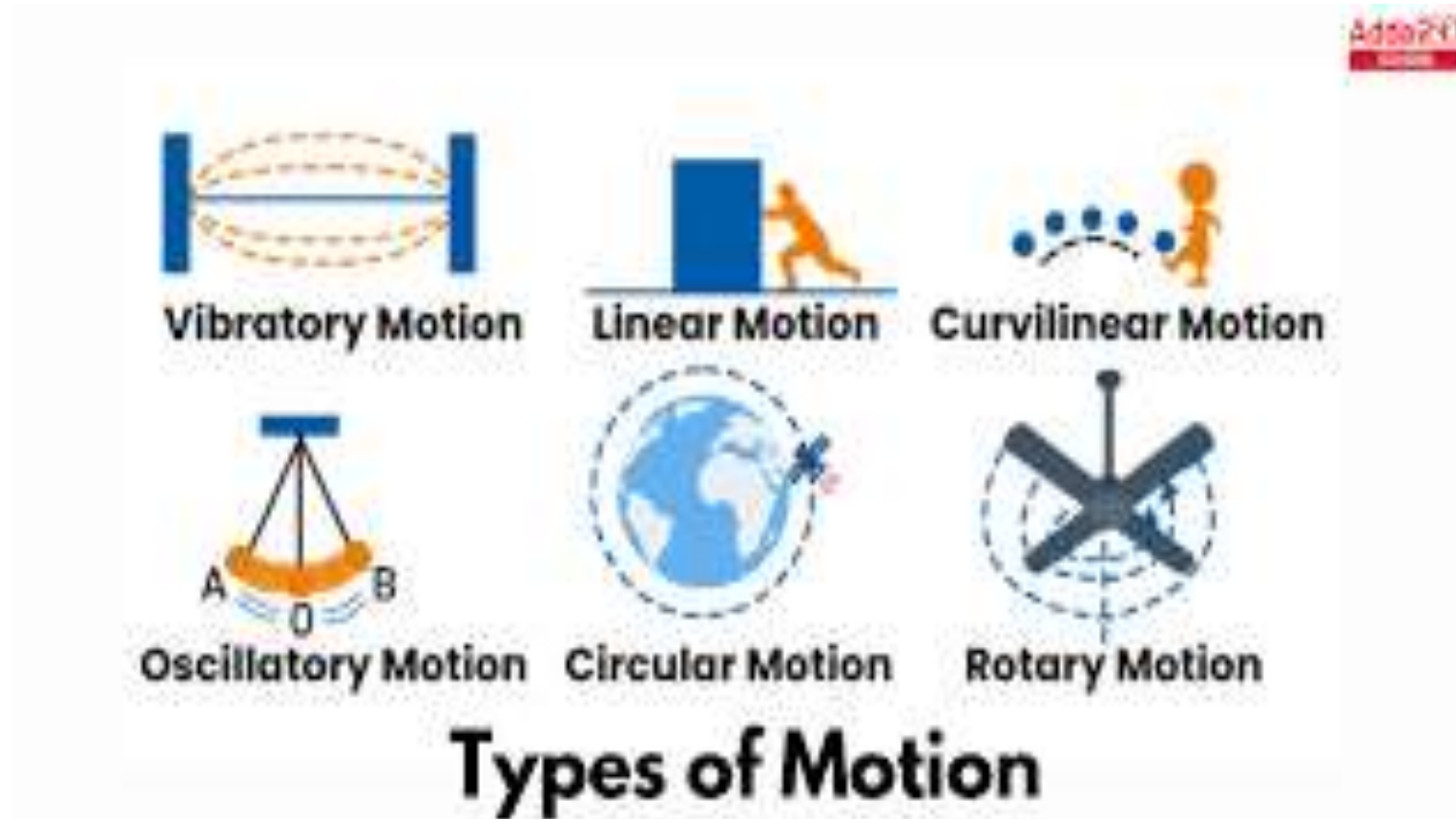
KINEMATIC CHAIN - TYPES



ACTIVE AND PASSIVE INSUFFICIENCY



TYPE OF MOTION



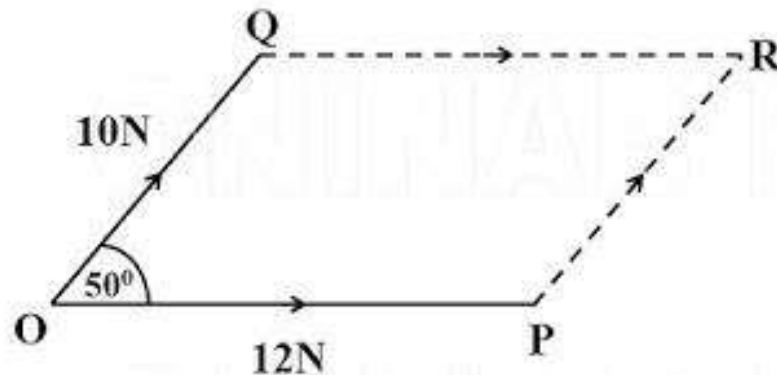
FORCE – COMPOSITION, PARALLELOGRAM OF FORCE

Resultant of Two Forces Acting at a Point



Parallelogram Law of Composition of Two Forces

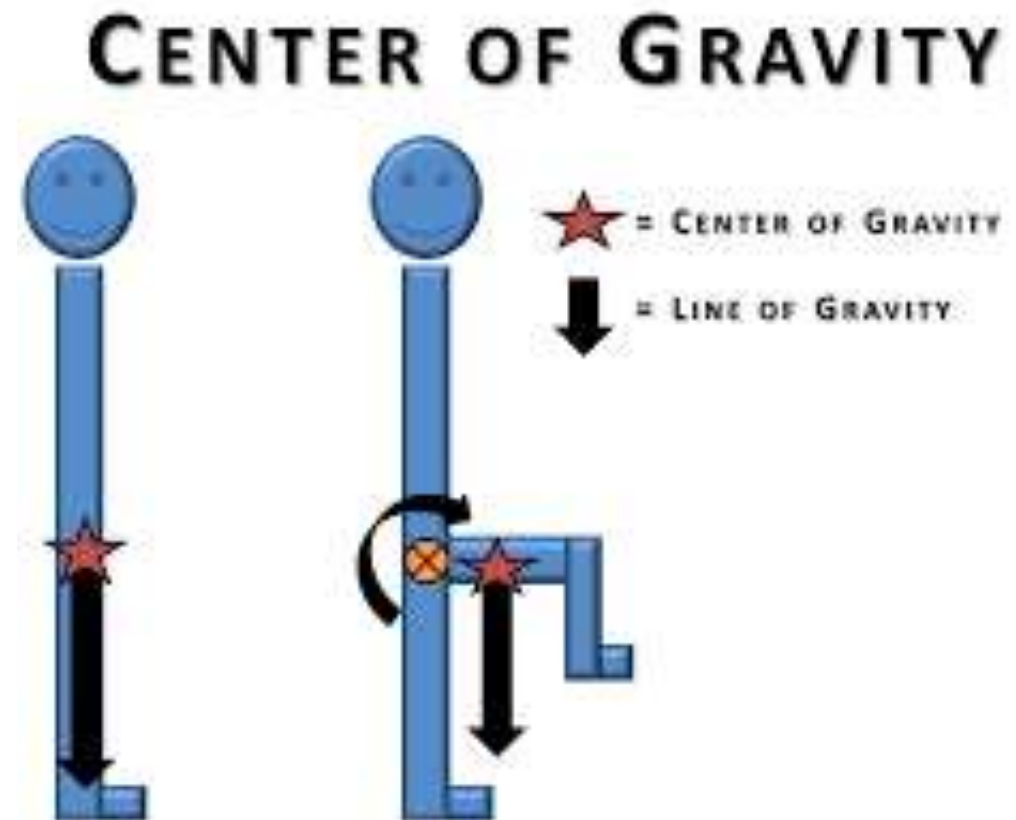
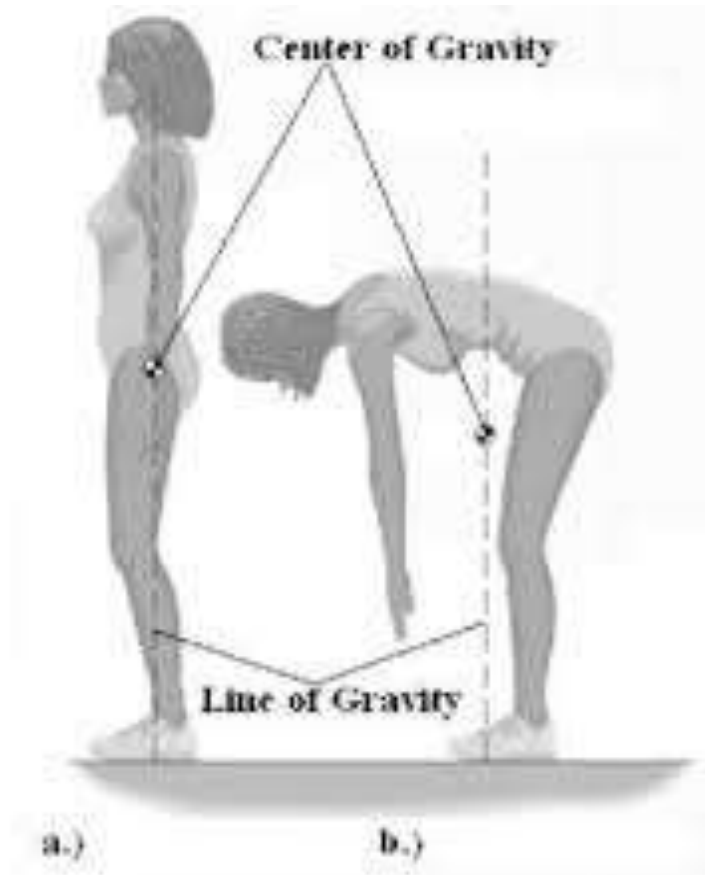
Two forces P and Q act at a point O. Their magnitude are respectively 12N and 10N. If the angle between P and Q at their point of action is 50° , find the resultant of the two forces.



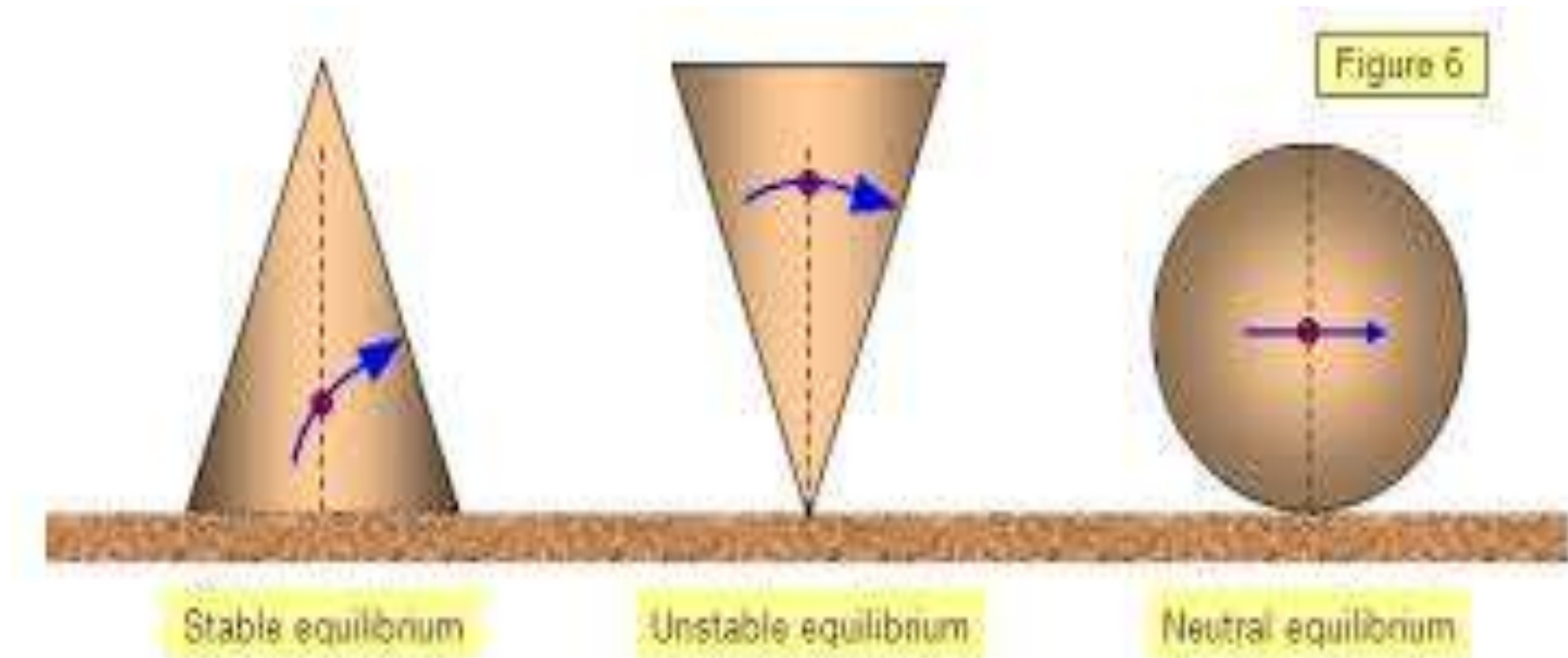
The Statement of Parallelogram law.

If two forces acting at a point are represented in magnitude and direction by two adjacent sides of a parallelogram, then the resultant of the two forces is represented in magnitude and direction by the diagonal of the parallelogram, drawn from the point of action of the two forces.

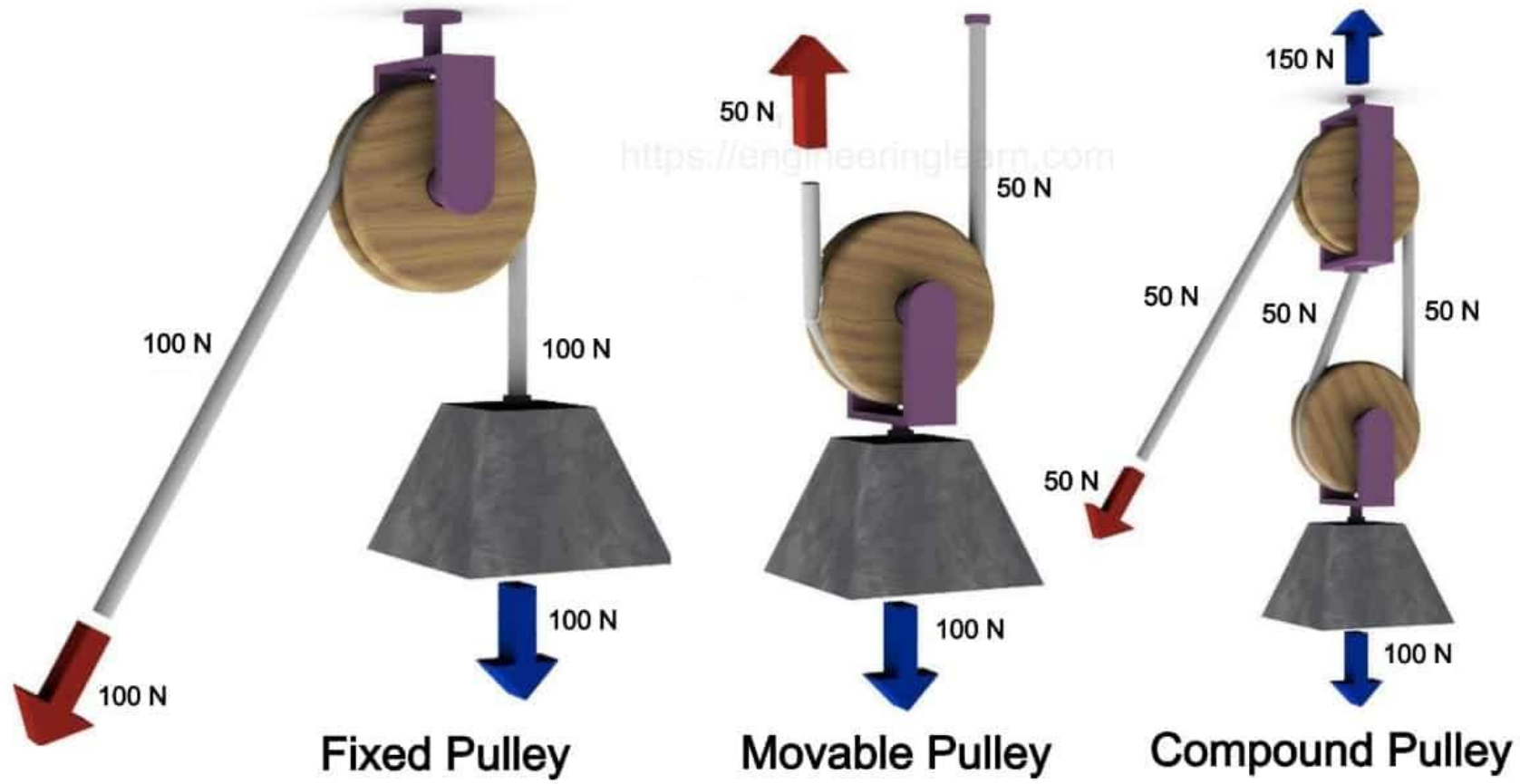
GRAVITY



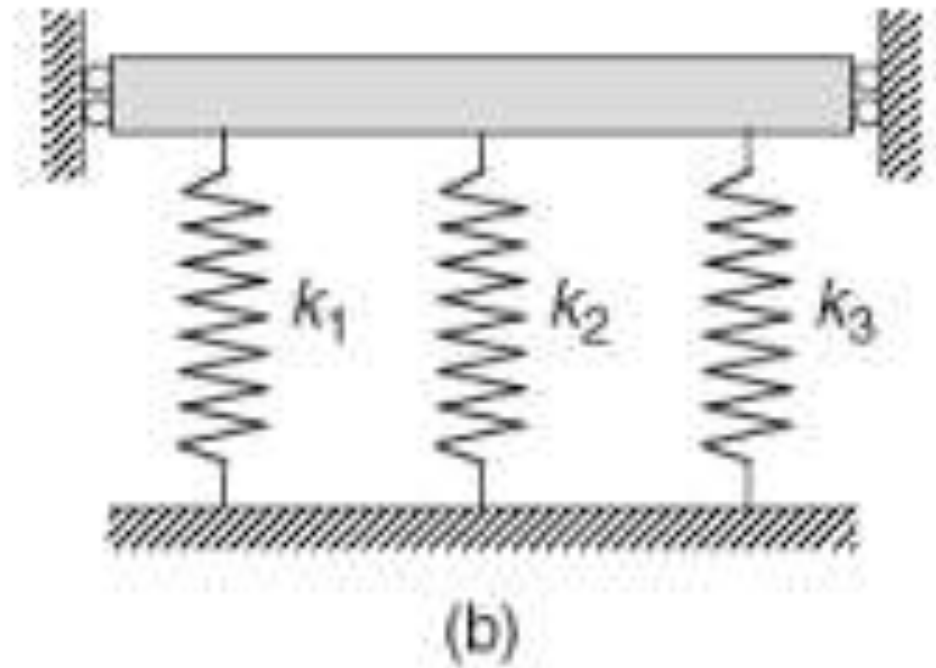
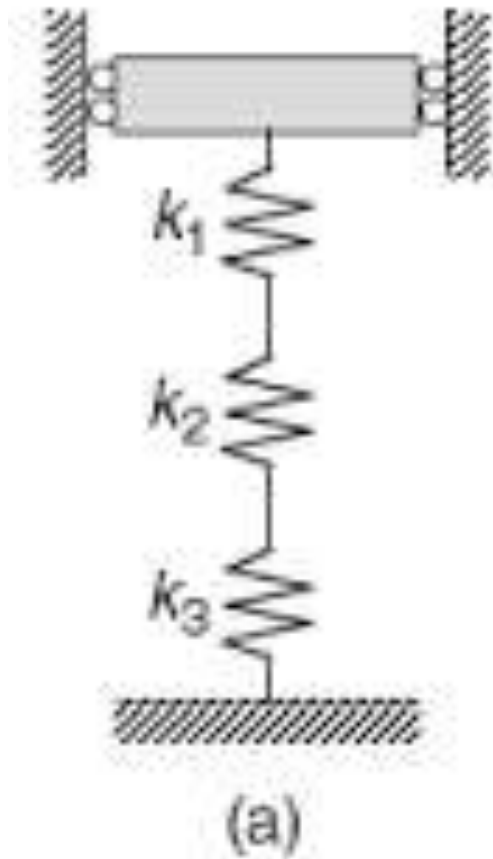
EQUILIBRIUM



PULLEY



SPRINGS



INCLASS ASSESSMENT

1. Flexion at a synovial joint is BEST described as:

- a) Movement that increases the angle between two segments
- b) Movement that decreases the angle between two segments
- c) Movement away from the midline of the body
- d) Circular movement combining several basic movements

2. Which of the following is the BEST example of an open kinematic chain exercise?

- a) Squat
- b) Push-up
- c) Seated knee extension on a machine
- d) Leg press

3. Active insufficiency of the hamstrings is MOST likely to occur in which position?

- a) Hip flexion with knee flexion
- b) Hip extension with knee flexion
- c) Hip flexion with knee extension
- d) Hip neutral with knee extension

INCLASS ASSESSMENT

4. A body is said to be in stable equilibrium when:

- a) Its center of gravity is high and base of support is narrow
- b) Any slight displacement causes it to topple
- c) Any slight displacement causes it to return to its original position
- d) It continues to move after a slight displacement

5. Which of the following statements about fixed pulleys is MOST accurate?

- a) They change the magnitude of force but not its direction
- b) They change the direction of force but not its magnitude
- c) They provide a mechanical advantage greater than 1
- d) They always reduce the effort required to lift a load

INCLASS ASSESSMENT

ANSWERS

1. b) Movement that decreases the angle between two segments
2. c) Seated knee extension on a machine
3. a) Hip flexion with knee flexion
4. c) Any slight displacement causes it to return to its original position
5. b) They change the direction of force but not its magnitude

THANK YOU!!!!

References Books:

- +Kisner & Colby - Therapeutic Exercises : Foundations and Techniques
- +Dina Gardiner - Exercise Therapy
- +Lakshminarayan - Textbook of Therapeutic Exercises
- +Roshan Meena - Exercise Therapy Principles and Practice
- +Phyllis Fletcher Cook and Margaret Hollis - Practical Exercise Therapy