

Kingdom of Saudi Arabia
Ministry of Education
Umm Al-Qura University
College of Applied Sciences
Physics Department



Semester: 1st semester 1439-1440
Exam: 2nd Class Test Exam
Program: Medical Physics
Course: Biomechanics.
Course Code: 4032293-3
Exam Time: 1 Hr
Exam Date: 2 /4 /1440 A. H
Total Exam Marks: **15 Mark**

Student's Name:

Student ID:

Group No.:

Please answer **Three** questions only:

اجب عن ثلاثة أسئلة فقط

Question One

[5Marks]

Define each item of the followings (Answer 5 items only):

- 1) *Elastic limit.*
- 2) *Ductile material.*
- 3) *Brittle material.*
- 4) *Homogeneous material.*
- 5) *Resilience energy of bone.*
- 6) *Breaking stress:*
- 7) *Hook's law.*

Question Two

[5 Marks]

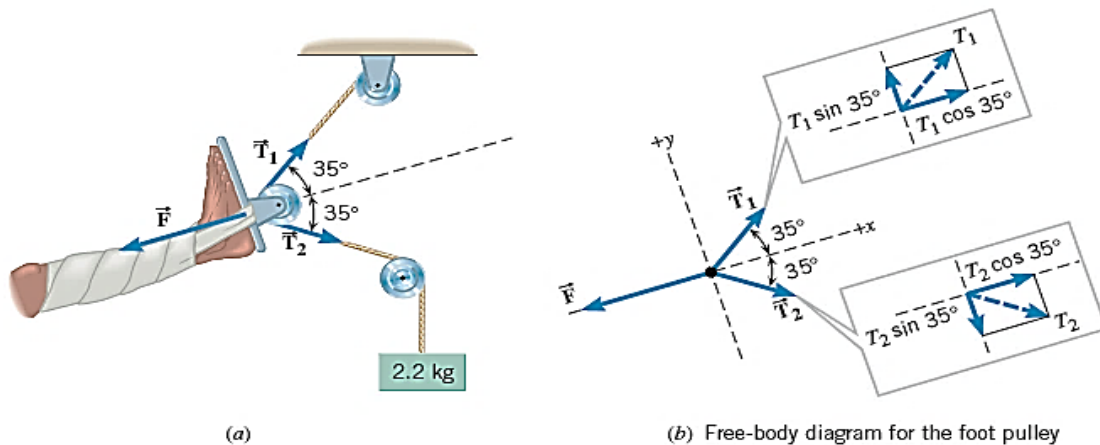
Mark Right (R) or Wrong (W) and correct the wrong one:

- a- The greater the strength of a substance, the higher its breaking stress. ()
- b- The greater the stiffness of the material, the higher the strain produced. ()
- c- The stress is unitless. ()
- d- A compressive stress occurs when equal and opposite forces are directed away from each other ()
- e- The elastic limit is the greatest stress a body can experience without breaking or rupturing. ()
- f- The bulk modulus is positive because of increase in Volume. ()

Question Three

[5 Marks]

From the opposite figure a traction device used with an injury. The weight of the 2.2-kg object creates a tension in the rope that passes around the pulleys. Therefore, tension forces \vec{T}_1 and \vec{T}_2 are applied to the pulley on the foot. It may seem surprising that the rope applies a force to either side of the foot pulley. A similar effect occurs when you place a finger inside a rubber band and push downward. You can feel each side of the rubber band pulling upward on the finger. The foot pulley is kept in equilibrium because the foot also applies a force F to it. This force arises in reaction (Newton's third law) to the pulling effect of the forces \vec{F}_1 and \vec{F}_2 . Ignoring the weight of the foot, Find the magnitude of \vec{F} ?



Question Four

[5 Marks]

What are the advantages of trabecular bone over compact bone?

Question Five

[5 Marks]

Define compliance of the blood vessels, compare between the compliance of artery and vein?

مع أطيب التمنيات بالنجاح و التفوق بأذن الله تعالى.