



قائمة الاسئلة

اختبار النهائي للعام الجامعي 2025/2024 - كلية الهندسة :: ميكانيكا حيوية - كلية الهندسة - قسم الطببة الحيوية- المستوى الثالث - 3 ساعات - درجات - د. مشتاق العززي

- 1) Which force acts on the body as a result of interaction with the ground?
 - 1) - Gravitational force
 - 2) Ground reaction force vector
 - 3) - Friction force
 - 4) - Weight body force
- 2) What is the function of the dashpot in the three-element model?
 - 1) - Producing force after stimulation
 - 2) - Indicating the total tension in the muscle
 - 3) - Representing elasticity of connective tissue
 - 4) Representing frictional dissipation within the muscle
- 3) Where is the center of gravity located in human body ?
 - 1) - Head
 - 2) - Chest
 - 3) Pelvis
 - 4) - Feet
- 4) Choose the functions of bone from the following choices.
 - 1) Providing structural support for all other components of the body
 - 2) - Is the tissue that produces blood cells
 - 3) - Is organized by two types cortical and trabecular bone
 - 4) - Are recruited to dissolve bone
- 5) Which joint experiences maximum dorsiflexion during the initial contact in the stance phase?
 - 1) - Knee joint
 - 2) - Hip joint
 - 3) Ankle joint
 - 4) - Elbow joint
- 6) What is the importance of study for trabecular bone?
 - 1) - The high density of this tissue
 - 2) - The low porosity
 - 3) - The high porosity
 - 4) The age-related fractures
- 7) Which joint primarily responsible for flexion during the swing phase ?
 - 1) - Ankle joint
 - 2) Hip joint
 - 3) - Knee joint
 - 4) - Shoulder joint
- 8) Force generation but fiber lengthening is also known as.....
 - 1) Eccentric contraction
 - 2) - Isotonic contraction
 - 3) - Isometric contraction.
 - 4) - Isotonic and isometric contraction
- 9) Bending of head towards right or left side of the shoulder is.....
 - 1) - Extension
 - 2) - flexion
 - 3) - Lateral extension.
 - 4) Lateral flexion
- 10) Which of the following is responsible for limiting the range of movements of joint?



- 1) - Tendons
 - 2) Ligament
 - 3) - Both tendons and ligaments
 - 4) - Muscle fibers.
- 11) Flexion at elbow is brought about by.....
- 1) - Biceps and Triceps
 - 2) - Triceps
 - 3) Biceps
 - 4) - Elbow joint
- 12) What is the primary muscle responsible for controlling knee flexion during mid stance?
- 1) - Gastrocnemius
 - 2) - Hamstrings
 - 3) Quadriceps
 - 4) - Gracilis
- 13) In isometric contraction, the muscle.....
- 1) - Shortens as well as lengthens.
 - 2) - Lengthens
 - 3) - Shortens
 - 4) Neither shortens nor lengthens
- 14) Which branch of mechanics describes the cause of motion?
- 1) Kinetics
 - 2) - Kinematics
 - 3) - Biomechanics
 - 4) - Fluid mechanics
- 15) The following bones form the elbow joint except
- 1) - Radius
 - 2) - Humerus
 - 3) - Ulna
 - 4) Scapula
- 16) What type of muscles is capable of resisting fatigue in a long duration activity?
- 1) - Quadriceps
 - 2) - Fast twitch
 - 3) Slow twitch
 - 4) - Intermediate twitch
- 17) Muscles which cause the joints to bend are called.....
- 1) Flexors
 - 2) - Extensors
 - 3) - Abductors
 - 4) - Adductors
- 18) During mid stance What is the primary function of knee joint?
- 1) - Flexion
 - 2) Extension
 - 3) - Rotation
 - 4) - Abduction
- 19) Which of the following factors contributes to the greater force generation in pennate muscles compared to parallel muscles?
- 1) - Larger shortening velocity
 - 2) Higher number of muscle fibers oriented at an angle
 - 3) - Smaller pennation angle





- 4) - Increased fiber length
- 20) What is the composition that providing stiffness of bone?
- 1) - The collagen fibers
 - 2) - The longitudinal alignment of the osteons and the orientation of the lamellae
 - 3) The hydroxyapatite mineral
 - 4) - Low relative density and architecture
- 21) What primarily determines the strength and stability of knee joint?
- 1) - Cartilage and muscle
 - 2) - Synovial fluid
 - 3) - Bones and nerves
 - 4) Tendons and ligament
- 22) What is primary function of muscles in biomechanics?
- 1) Force production
 - 2) - Energy storage
 - 3) - Joint flexibility
 - 4) - Thermal regulation
- 23) What type of force system is demonstrated by the hamstring muscles during knee flexion?
- 1) - Rotational force system
 - 2) - Concurrent force system
 - 3) - Perpendicular force system
 - 4) Parallel force system
- 24) you know that the femoro-patellar contact area is 3.5^2 cm and the contact force 440.8N what is the contact pressure?
- 1) - 108.8 pa
 - 2) 125.9 N/cm²
 - 3) - 1481.48 Pa
 - 4) - 1542.8 N/cm²
- 25) What is the effect of a fore couple in biomechanics?
- 1) - Produces a translational effect
 - 2) - Prevents movement
 - 3) Produces a rotatory effect
 - 4) - Only applies to external forces
- 26) What is the role of ATP in muscle contraction?
- 1) It breaks cross – bridges between actin and myosin
 - 2) - It binds to actin for contraction
 - 3) - It prevents calcium release
 - 4) - It inhibits myosin activity
- 27) Why is standing upright important for normal gait?
- 1) - It prevents movement of the legs
 - 2) It allows even distribution of weight on lower limb
 - 3) - It reduces energy expenditure
 - 4) - It increases arm strength
- 28) The force produced by muscle is directly proportional to its:
- 1) - Length
 - 2) - Endurance activity
 - 3) Cross sectional area
 - 4) - Mitochondrial density
- 29) Which of the following best explains the relationship between muscle force and velocity?
- 1) - As contraction velocity increases, force production increases





- 2) As contraction velocity increases, force production decreases
- 3) Force production is independent of contraction velocity
- 4) Force production is maximum at very high contraction velocities
- 30) The force applied by the quadriceps during knee extension is transferred through which structure?
- 1) Cruciate ligaments
- 2) Patellar tendon
- 3) Meniscus
- 4) Medial collateral ligament

