

LONG EXAM 1

TOPICS: The Cell; Epithelium and Glands; Anatomy of Motion; Upper Limb: Muscle and Fascia; Upper Limb: Nerve Supply; Muscle and Nervous Tissue; Upper Limb: Blood Supply and Venous and Lymphatic Drainage; Upper Limb: Clinical Correlation; Connective Tissue Proper and the Skin and Its Appendages

ANATOMY

LEGEND



Ratio from 2027 SB



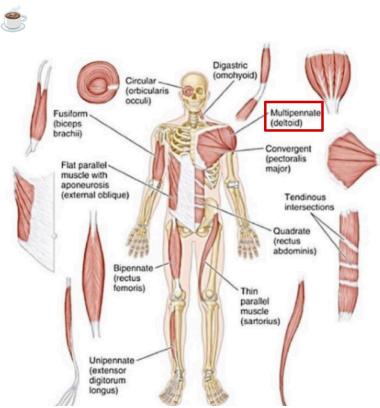
Explanation from Book / Trans



Explanation from Prof

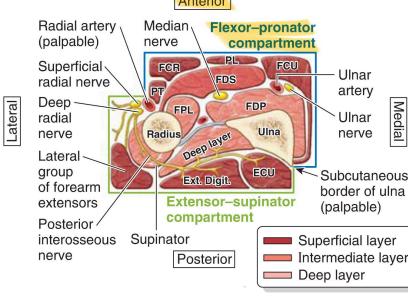
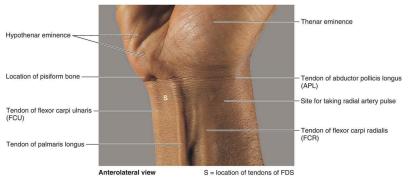
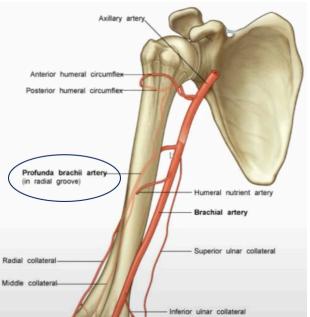
QUESTION		CHOICES	ANSWER & RATIONALE	
1	Which of the following planes divides the body into equal right and left halves	A. Coronal	Divides the body into anterior/ventral and posterior/dorsal Median sagittal plane is the sagittal plane at the midline of the body Divides the body into right and left sides. Divides the body into superior/upper and inferior/ lower	B
		B. Median		
		C. Sagittal		
		D. Transverse		
2	At an anatomical position, what is the action performed when the 2nd digit moves medially towards the 3rd digit	A. Abduction	Movement away from the midline of the body Movement towards the midline of the body Forward movement of the limb or part of the limb Backward movement of the limb or part of the limb	B
		B. Adduction		
		C. Flexion		
		D. Extension		
3	Which of the following anatomical landmark is BEST appreciated in anterior view?	A. Anatomical snuffbox	Located at the posterior side of the hand, between the extensor pollicis longus and extensor pollicis brevis. A depression close to the lateral aspect of the wrist seen during thumb extension Located at the back. Bordered by latissimus dorsi muscle (inferior), trapezius muscle (medial), scapula (lateral) Depression found on the <u>anterior</u> surface of the elbow. Located over the posterior scapular and subdeltoid regions. Bordered by teres minor (superior), teres major (inferior), shaft of the humerus (lateral), and long head of the triceps brachii (medial)	C
		B. Auscultation triangle		
		C. Cubital fossa		
		D. Quadrangular space		
4	The Scaphoid is BEST classified as what type of bone according to shape.	A. Irregular	Irregular bones have various shapes other than long, short, or flat (e.g., bones of the face) Long bones are tubular (e.g., humerus) Sesamoid bones develop in certain tendons and are found where tendons cross the ends of long bones in the limbs; they protect the tendons from excessive wear and often change the angle of the tendons as they pass to their attachments (e.g, patella, pisiform)	D
		B. Long		
		C. Sesamoid		

		D. Short		<p> Short bones are cuboidal and are found only in the tarsus (ankle) and carpus (wrist)</p> <p> Carpal bones: Hamate, Capitate, Trapezoid, Trapezium, Scaphoid, Lunate, Triquetrum, Pisiform</p>																		
5	What happens to the thumb when it is in opposition?	A. The thumb moves laterally to the index finger	C	<p> The movement of the thumb laterally to the index finger is termed as repositioning.</p>																		
		B. The thumb moves anteriorly away from the index finger		The movement of the thumb anteriorly away from the index finger is termed as abduction.																		
		C. The thumb touches pads with the index finger		<p> The opposition of the thumb is defined as the positioning of the thumb pad to come into contact with the pads of the other fingers. This allows the hand to grasp objects, hold utensils, write and type.</p>																		
		D. The thumb moves parallel to the index finger		<p> The movement of the thumb parallel to the index finger is termed as adduction.</p>																		
6	Which of the following parts of the humerus is MOST DISTAL to the glenoid fossa?	A. Lesser tubercle	C	<p> Lesser tubercle is located inferior to the anatomical head and superior to the surgical neck. Projects anteriorly from the bone.</p>																		
		B. Spiral groove		<p> Located posteriorly on the shaft of the humerus.</p>																		
		C. Olecranon fossa		<p> Distal portion. Includes the trochlea, capitulum, olecranon coronoid and radial fossae.</p>																		
		D. Anatomical/surgical neck		<p> Anatomical neck is located at the proximal end of the humerus. Indicates line of attachment of the glenohumeral joint capsule (glenoid cavity).</p> <p> Surgical neck is the narrow part distal to the head and tubercles. It is a common site of fracture.</p>																		
7	The first carpometacarpal joint is an example of which joint?	A. Condyloid	D	<p></p> <p>Table 5. Joints of the Upper Limb</p> <table border="1"> <thead> <tr> <th>Segment</th> <th>Joints</th> <th>Classification</th> </tr> </thead> <tbody> <tr> <td>Shoulder</td> <td>Acromioclavicular joint Glenohumeral joint</td> <td>Plane type (Synovial) Ball-and-socket (Multiaxial)</td> </tr> <tr> <td>Elbow</td> <td>Elbow joint</td> <td>Hinge type (Synovial)</td> </tr> <tr> <td>Forearm</td> <td>Proximal radioulnar joint (between radius and ulna)</td> <td>Pivot type (Synovial)</td> </tr> <tr> <td>Wrist</td> <td>Distal radioulnar joint Radiocarpal joint Midcarpal joint</td> <td>Pivot type (Synovial) Ellipsoid/ Condyloid type (Synovial) Plane type (Synovial)</td> </tr> <tr> <td>Hand</td> <td>Carpometacarpal joint (at the base of 1st digit - thumb) Metacarpophalangeal joints Intercarpal joints Intermetacarpal joints</td> <td>Saddle type (Synovial) Condyloid type (Synovial) Plane type (Synovial)</td> </tr> </tbody> </table>	Segment	Joints	Classification	Shoulder	Acromioclavicular joint Glenohumeral joint	Plane type (Synovial) Ball-and-socket (Multiaxial)	Elbow	Elbow joint	Hinge type (Synovial)	Forearm	Proximal radioulnar joint (between radius and ulna)	Pivot type (Synovial)	Wrist	Distal radioulnar joint Radiocarpal joint Midcarpal joint	Pivot type (Synovial) Ellipsoid/ Condyloid type (Synovial) Plane type (Synovial)	Hand	Carpometacarpal joint (at the base of 1st digit - thumb) Metacarpophalangeal joints Intercarpal joints Intermetacarpal joints	Saddle type (Synovial) Condyloid type (Synovial) Plane type (Synovial)
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B. Hinge																						
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8	Which of the following BEST describes a uniaxial joint?	A. Carpometacarpal joint	B	<p> Saddle joint (biaxial)</p>																		
		B. Radioulnar joint		<p> Pivot joint (uniaxial)</p>																		
		C. Glenohumeral joint .		<p> Ball-and-socket joint (multiaxial)</p>																		

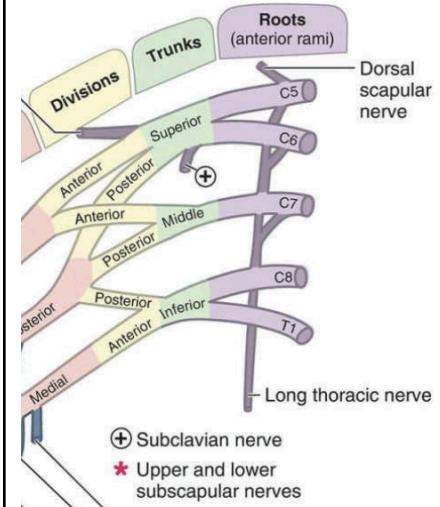
		D. Metacarpophalangeal joint		 Condyloid joint (biaxial)
9	What muscle characteristic features fibers arranged in a feather-like pattern central to a tendon?	A. Circular	D	 Surround a body opening / orifice; sphincter muscles; found around the eyes, mouth and anus.
		B. Convergent		 Wide base; other end of the muscle converges to a singular tendon
		C. Fusiform		Spindle-shaped; wider belly; presence of tendons on both ends; most common type of muscles in the limbs
		D. Pennate		 Feather-like ("penna") in the arrangement of the fascicles; one angle pull motion <ul style="list-style-type: none"> • Unipennate – "Leaf-like"; tendon lies along one side of the muscle • Bipennate – "two-leaved muscle"; tendon lies in the center of the muscle
10	Which muscle can best be described as multipennate?	A. Biceps brachii B. Deltoid C. Dorsal Interossei D. Second Lumbricals	B	
11	What type of joint is best classified as cartilaginous?	A. Diarthrosis B. Gomphosis C. Symphysis D. Syndesmosis	C	Symphysis is a secondary cartilaginous joint composed of fibrocartilage (fibrocartilaginous joint). It is considered amphiarthroses, meaning they allow only slight movement and are all found at the skeletal midline.
12	Which cartilage is being eroded and replaced by osteoblasts during endochondral ossification?	A. Elastic B. Fibrocartilage C. Hyaline D. Osteoclast	C	Endochondral Ossification– Pre Existing hyaline cartilage is used as a template. Intramembranous Ossification- Osteoblast differentiate directly from mesenchyme
13	Which compartment is the brachioradialis muscle?	A. Anterior Arm B. Posterior Arm C. Anterior Forearm D. Posterior Forearm	D	Biceps brachii, Brachialis, Coracobrachialis Triceps brachii, Anconeus Superficial: Pronator Teres, Flexor carpi radialis, Palmaris Longus, Flexor Carpi Ulnaris Superficial: Extensor carpi radialis (longus and brevis), Extensor digitorum, Extensor digiti minimi, Extensor carpi ulnaris, Brachioradialis

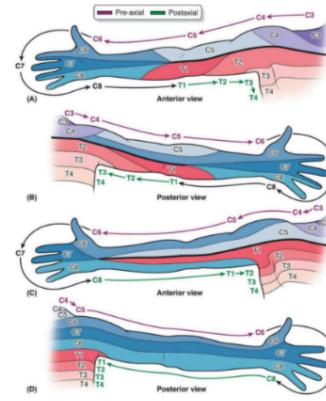
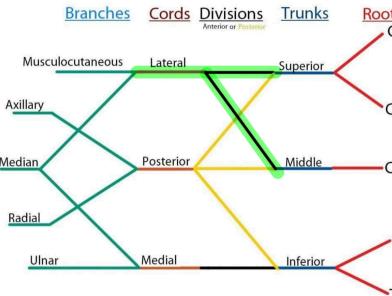
14	What is the superior border of the triangular space?	<p>A. Teres Major</p> <p>B. Humerus</p> <p>C. Triceps brachii long head</p> <p>D. Teres Minor</p>	D	 <table border="1" data-bbox="1199 168 1493 380"> <thead> <tr> <th colspan="4">SUMMARY OF THE SPACES IN THE SHOULDER</th> </tr> <tr> <th>BORDERS</th><th>QUADRANGULAR SPACE</th><th>TRIANGULAR SPACE</th><th>TRIANGULAR INTERVAL</th></tr> </thead> <tbody> <tr> <td>Superior</td><td>Teres minor</td><td>TERES MINOR</td><td>Teres major</td></tr> <tr> <td>Inferior</td><td>Teres major</td><td>Teres major</td><td>—</td></tr> <tr> <td>Medial</td><td>Long head of triceps brachii</td><td>Long head of triceps brachii</td><td>Long head of triceps brachii</td></tr> <tr> <td>Lateral</td><td>Surgical neck of humerus</td><td>—</td><td>Shaft of humerus</td></tr> <tr> <td>Contents</td><td> <ul style="list-style-type: none"> • Axillary nerve • Posterior circumflex humeral artery </td><td> <ul style="list-style-type: none"> • Circumflex scapular artery </td><td> <ul style="list-style-type: none"> • Radial nerve • Profunda brachii artery </td></tr> </tbody> </table>	SUMMARY OF THE SPACES IN THE SHOULDER				BORDERS	QUADRANGULAR SPACE	TRIANGULAR SPACE	TRIANGULAR INTERVAL	Superior	Teres minor	TERES MINOR	Teres major	Inferior	Teres major	Teres major	—	Medial	Long head of triceps brachii	Long head of triceps brachii	Long head of triceps brachii	Lateral	Surgical neck of humerus	—	Shaft of humerus	Contents	<ul style="list-style-type: none"> • Axillary nerve • Posterior circumflex humeral artery 	<ul style="list-style-type: none"> • Circumflex scapular artery 	<ul style="list-style-type: none"> • Radial nerve • Profunda brachii artery
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15	Which part of the clavipectoral fascia does the cephalic vein pierce?	<p>A. Axillary Fascia</p> <p>B. Costocoracoid membrane</p> <p>C. Pectoral Fascia</p> <p>D. Suspensory ligament of axilla</p>	B	<p>The clavipectoral fascia, also known as the costocoracoid membrane, is a connective tissue structure in the shoulder region. It extends between the clavicle and the coracoid process of the scapula. The cephalic vein, which is a superficial vein of the upper limb, travels up the arm and passes through the deltopectoral groove before it pierces the costocoracoid membrane to drain into the axillary vein.</p>																												
16	Which of the following rotator cuff muscles inserts into the lesser humeral tubercle, which is responsible for the internal rotation at the shoulder?	<p>A. Supraspinatus</p> <p>B. Infraspinatus</p> <p>C. Teres minor</p> <p>D. Subscapularis</p>	D	<p> The supraspinatus inserts into the superior facet of the greater tubercle of the humerus and assists the deltoid in the first 15 degrees of shoulder abduction while also contributing to shoulder stability.</p> <p> The infraspinatus attaches to the middle facet of the greater tubercle and is mainly responsible for external rotation of the shoulder, also playing a role in joint stabilization.</p> <p> The teres minor inserts into the inferior facet of the greater tubercle and assists with external rotation and shoulder joint stability.</p> <p> The subscapularis muscle primarily performs internal rotation of the shoulder and helps stabilize the shoulder joint by keeping the head of the humerus properly positioned in the glenoid cavity.</p>																												
17	What is the muscle that INITIATES the first 15 degrees of abduction of the arm?	<p>A. Deltoid</p> <p>B. Serratus anterior</p> <p>C. Supraspinatus</p> <p>D. Trapezius</p>	C	<p> When the arm is fully adducted, the line of pull of the deltoid coincides with the axis of the humerus. It pulls directly upward on the bone and cannot initiate abduction until after the first 10 – 15 degrees of abduction which is why it needs the help of the supraspinatus.</p>																												
18	What is the proximal attachment of the levator scapulae muscles?	<p>A. External occipital protuberance</p> <p>B. Spinous processes of the upper cervical vertebrae</p> <p>C. Transverse processes of the upper cervical vertebrae</p>	C*	<p> OINA of Levator Scapulae Ms.</p> <table border="1" data-bbox="1085 1520 1525 1795"> <tbody> <tr> <td>Proximal Attachment</td><td>Posterior tubercles of transverse processes of C1-C4 vertebrae</td></tr> <tr> <td>Distal Attachment</td><td>Superior angle of the scapula/ medial border of scapula superior to root of scapular spine</td></tr> <tr> <td>Innervation</td><td>Dorsal scapula (C4,C5) and cervical (C3,C4) nerves</td></tr> <tr> <td>Main Action</td><td>Elevates scapula and tilts the glenoid cavity inferiorly by rotating scapula</td></tr> </tbody> </table>	Proximal Attachment	Posterior tubercles of transverse processes of C1-C4 vertebrae	Distal Attachment	Superior angle of the scapula/ medial border of scapula superior to root of scapular spine	Innervation	Dorsal scapula (C4,C5) and cervical (C3,C4) nerves	Main Action	Elevates scapula and tilts the glenoid cavity inferiorly by rotating scapula																				
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19	What muscle in the posterior forearm compartment abducts the hand?	<p>A. Extensor carpi radialis longus</p> <p>B. Extensor carpi radialis brevis</p> <p>C. Extensor carpi ulnaris</p>	C	<p> Extends and abducts hand at the wrist</p> <p> Extends and abducts hand at the wrist</p> <p> Extends and adducts hand at the wrist</p>																												

		D. Flexor carpi ulnaris		Flexes and adducts hand at the wrist								
20	Which muscle is the PRIMARY flexor of the elbow?	A. Biceps brachii	B	Biceps brachii — flexor of forearm when supinated; supinator of forearm								
		B. Brachialis		Brachialis — Workhorse of the elbow flexors								
		C. Brachioradialis		Brachioradialis — flexor of forearm; stabilize the elbow joint in conjunction with the biceps brachii								
		D. Coracobrachialis		Coracobrachialis — Flexor and adductor of arm								
21	Where does the nerve supply of the deltoid muscle pass through in the following subfascia?	A. Quadrangular Space	A	Contains axillary nerve (main innervation of deltoid) and posterior humeral circumflex artery								
		B. Triangular Space		Contains circumflex scapular artery								
		C. Triangular Interval		Contains radial nerve and profunda brachii artery								
22	Which of the following muscles is the primary abductor of the arm?	A. Biceps Brachii	C	deltoid is the primary muscle responsible for abduction of the arm especially beyond the 1st 15 degrees. From 0 to 15 degrees, the supraspinatus is the strongest initiator of abduction.								
		B. Coracobrachialis										
		C. Deltoid										
		D. Latissimus Dorsi										
23	The tendons of which muscles divide into the medial and lateral bands before attaching to the middle phalanx?	A. Extensor Digitorum	B	<p>Table 37. OINA/PDNA of Flexor Digitorum Superficialis</p> <table border="1"> <tr> <td>Proximal Attachment</td> <td>Humero-ulnar head - medial epicondyle (common flexor origin and coronoid process)</td> </tr> <tr> <td>Radial Head</td> <td>superior half of anterior border</td> </tr> <tr> <td>Distal Attachment</td> <td>Shafts of middle phalanges of medial four digits</td> </tr> <tr> <td>Innervation</td> <td>Median nerve (C7, C8, T1)</td> </tr> </table>	Proximal Attachment	Humero-ulnar head - medial epicondyle (common flexor origin and coronoid process)	Radial Head	superior half of anterior border	Distal Attachment	Shafts of middle phalanges of medial four digits	Innervation	Median nerve (C7, C8, T1)
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B. Flexor Digitorum Superficialis												
C. Flexor Digitorum Profundus												
D. Flexor Pollicis Longus												
24	What muscle extends the interphalangeal joints and flexes the metacarpophalangeal joints?	A. Palmar Interossei	C	Palmar Interossei – adduction of fingers, move fingers towards midline *Interossei assist lumbricals								
		B. Extensor Digitorum		Extensor Digitorum – extend medial four digits								
		C. Lumbricals		Lumbricals – main action is to flex the MCP joints and extend the interphalangeal joints of the 2nd-5th digits								
		D. Dorsal Interossei		Dorsal Interossei – abduction of fingers, fan out fingers away from midline/hand *Interossei assist lumbricals								

25	In what compartment are pronator muscles located?	<p>A. Posterior arm compartment</p> <p>B. Posterior forearm compartment</p> <p>C. Anterior arm compartment</p> <p>D. Anterior forearm compartment</p>	<p>Pronator muscles are located in the anterior forearm compartment.</p>  <p>D</p>
26	At the wrist, the radial pulse is BEST palpated between the tendons of Flexor carpi radialis and the?	<p>A. Abductor pollicis longus</p> <p>B. Brachioradialis</p> <p>C. Flexor pollicis longus</p> <p>D. Palmaris longus</p>	<p>Abductor pollicis longus – located posteriorly and forms the anatomical snuff box with extensor pollicis brevis.</p> <p>Brachioradialis – located anteriorly to the lateral side of flexor carpi radialis and the radial artery.</p>  <p>B</p>
27	Which of the following arteries passes through the radial groove to supply the posterior compartment of the arm?	<p>A. Brachial artery</p> <p>B. Inferior collateral artery</p> <p>C. Profunda brachii</p> <p>D. Radial artery</p>	<p>Profunda brachii artery</p> <ul style="list-style-type: none"> → Accompanies radial nerve through spiral groove → Supplies the triceps muscle  <p>C</p>
28	A patient with a history of shoulder injury involving the quadrangular space would most likely affect the following arteries?	<p>A. Anterior circumflex humeral artery</p> <p>B. Anterior ulnar recurrent artery</p> <p>C. Posterior circumflex humeral artery</p> <p>D. Profunda brachii artery</p>	<p>Injury involving the quadrangular space will affect arteries that pass through it.</p> <p>Contents of the quadrangular space:</p> <ul style="list-style-type: none"> → Axillary nerve → Posterior circumflex humeral artery <p>C</p>

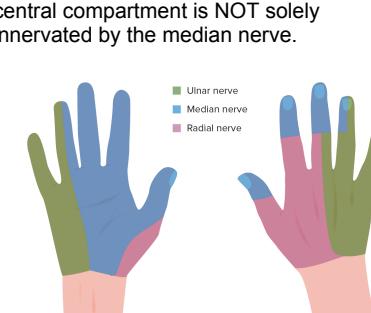
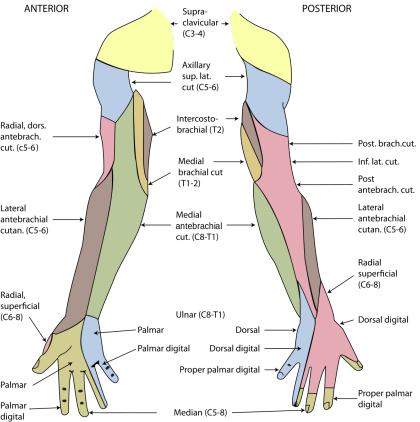
29	The lymph from the mammary gland drains INITIALLY into which group of axillary lymph nodes?	A. Anterior	A	Anterior (Pectoral) Anterolateral part of thoracic wall Mammary gland
		B. Posterior		Posterior (Subscapular) Posterior thoracic wall Shoulder region Lower part of back & neck
		C. Lateral		Lateral (Humeral) Nearly ALL of the lymph from the upper limbs
		D. Central		Central Receives drainage from anterior, posterior, and lateral lymph nodes Apical ALL other axillary nodes
30	Which of the following structures represent the fused protein rich cytoplasmic surface of the schwann cells?	A. internodal segments	B	The length of axon ensheathed by one Schwann cell, the internodal segment, varies directly with axonal diameter and ranges from 300 to 1500 μm
		B. major dense line		The prominent electron-dense layers visible ultrastructurally in the sheath, the major dense lines , represent the fused, protein-rich cytoplasmic surfaces of the Schwann cell membrane.
		C. myelin cleft		At these myelin clefs (or Schmidt-Lanterman clefs) the major dense lines temporarily disappear
		D. nodes of ranvier		Between adjacent Schwann cells on an axon the myelin sheath shows small nodes of Ranvier, where the axon is only partially covered by interdigitating Schwann cell processes.
31	The ulnar artery gives off the deep palmar branch lateral to which of the following carpal bones?	A. Hamate	A	The ulnar artery and nerve enters the hand superficial to the Flexor retinaculum and at the radial side of the Pisiform (Lateral to Pisiform) at the Hamate. It ascends and curves radially toward the midpalm. It anastomosed with the superficial palmar branch of the radial artery. The branches of the superficial arch will supply the medial three and a half digits. The radial one and a half digits are supplied by the deep palmar arterial arch.
		B. Pisiform		
		C. Scaphoid		
		D. Trapezoid		
32	Which of the following veins unite to form the axillary vein?	A. Antecubital & Brachial	B	Axillary vein is formed by the union of the basilic vein and brachial vein.
		B. Basilic & Brachial		
		C. Cephalic & Basilic		
		D. Cephalic & Brachial		
33	Which of the following statements BEST describes the cephalic vein?	A. It accompanies the brachial artery	D	Brachial artery is accompanied by brachial vein.
		B. It drains the ulnar side of the hand		Basilic vein is on the ulnar side. Cephalic vein is on the lateral side.
		C. It empties directly into the subclavian vein		Basilic vein drains into the axillary vein

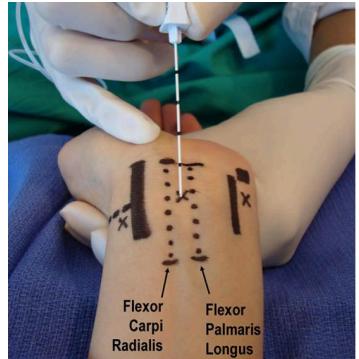
		D. It courses along the deltopectoral groove		-
34	The palmar metacarpal arteries are DIRECT branches of which arterial arch?	A. Deep Palmar B. Dorsal Carpal C. Palmar Carpal D. Superior Palmar	A	[2024 Trans] The Deep Palmar arch gives rise to: <ul style="list-style-type: none">• Three palmar metacarpal arteries• Radialis indicis artery<ul style="list-style-type: none">→ Supplies the radial side of the index finger• Princeps pollicis artery<ul style="list-style-type: none">→ Supplies the thumb
35	The first part of the axillary artery ENDS at which landmark?	A. Inferior border of the Clavicle B. Inferior border of the Teres Major C. Medial Border of the Pectoralis Minor D. Lateral Border of the 1st rib	C	Landmark for the END of subclavian a. Landmark for the start of Brachial a. Landmark for the START of 1st part of Axillary a.
36	Elastic lamellae of the walls of the aorta are synthesized by which of the following cells?	A. Cardiac muscle B. Fibroblasts C. Reticular cells D. Smooth muscle	D	Found in heart and their cells cannot undergo mitosis (cannot synthesize) Synthesize and secrete collagen and elastin in connective tissues Synthesize reticular fibers found in lymphoid organs which creates a meshwork for the passage of leukocytes and lymph
37	The inferior ulnar collateral artery is directed towards the forearm to anastomose with which artery?	A. Radial recurrent a. B. Interosseus recurrent a. C. Anterior ulnar recurrent a. D. Posterior ulnar recurrent a.	C	For elbow anastomoses, remember SIMR-PAIR: S uperior ulnar collateral - P osterior ulnar recurrent I nferior ulnar collateral - A nterior ulnar recurrent M iddle collateral - I nterosseus recurrent R adial collateral - R adial recurrent
38	The nerve to the subclavius muscle is a branch of which trunk of the brachial plexus?	A. Superior B. Middle C. Inferior	A	 <p>The diagram illustrates the course of the brachial plexus. It shows the roots (C5-T1) originating from the spinal nerves, which converge to form the trunks. The trunks then divide into anterior and posterior divisions. The posterior division further divides into anterior and posterior rami. The anterior rami contribute to the medial cord, while the posterior rami contribute to the lateral cord. The medial cord gives off the medial pectoral nerve, and the lateral cord gives off the lateral pectoral nerve. The pectoral nerves then join to form the pectoral cutaneous nerve. Other branches shown include the long thoracic nerve, which originates from C7, and the subclavian nerve, which originates from C8. The diagram also indicates the upper and lower subscapular nerves.</p> <p>Roots (anterior rami)</p> <p>Dorsal scapular nerve</p> <p>Divisions</p> <p>Trunks</p> <p>C5, C6, C7, C8, T1</p> <p>Anterior, Posterior</p> <p>Anterior, Posterior, Middle</p> <p>Posterior, Anterior, Inferior</p> <p>Medial</p> <p>Long thoracic nerve</p> <p>Subclavian nerve</p> <p>Upper and lower subscapular nerves</p> <p>Clinically Oriented Anatomy (Moore 8th ed., p. 497)</p>

39	<p>The skin overlying the tip of the thumb is innervated by which spinal nerve root?</p>	<p>A. C6 B. C7 C. C8 D. T1</p>	A 
40	<p>Which among the cords of the brachial plexus is formed by the confluence of anterior division of the upper and medial trunks?</p>	<p>A. Lateral B. Posterior C. Medial</p>	A 
41	<p>Which nerve is at risk of injury during deltoid intramuscular injection?</p>	<p>A. Axillary B. Musculocutaneous C. Radial D. Suprascapular</p>	A <p>Innervates deltoid muscle Innervates biceps brachialis, biceps brachii, coracobrachialis Innervates posterior arm and posterior forearm Innervates supraspinatus and infraspinatus</p>
42	<p>A radial nerve injury at the origin will cause an inability to do the following action:</p>	<p>A. Finger adduction B. Forearm pronation C. Wrist extension D. Shoulder abduction</p>	C <p>Finger adduction and abduction is controlled by the deep ulnar branch of the ulnar nerve The median nerve supplies all forearm pronator muscles The radial nerve is responsible for innervating the extensor muscles of the wrist and hand found in the posterior forearm compartment. The suprascapular abducts the shoulder within the first 15 degrees and is innervated by the suprascapular nerve. The deltoid takes over abduction beyond 15 degrees and is innervated by the axillary nerve.</p>
43	<p>Set A: Median nerve injury would most likely cause atrophy of which of the following intrinsic hand muscles?</p>	<p>A. Adductor pollicis B. Abductor pollicis brevis C. Dorsal interossei D. Flexor digiti minimi</p>	B <p> Innervated by the ulnar nerve, so it will not atrophy due to median nerve injury.</p> <p> This muscle is innervated by the median nerve, making it susceptible to atrophy with median nerve injury.</p> <p> Nerve supply of the dorsal interossei is the ulnar nerve.</p> <p> Flexor digiti minimi is innervated by the deep branch of the ulnar nerve.</p>

43	Set B: Which of the following nerve passes through the Guyon's Canal?	<p>A. Median</p> <p>B. Radial</p> <p>C. Ulnar</p> <p>D. Axillary</p>	<p>C</p> <ul style="list-style-type: none"> Pathway <ul style="list-style-type: none"> Lateral to axillary artery Descends to the arm Adjacent to brachial artery With nerve crossing gradually anterior to the artery to lie medial to the artery in the cubital fossa Radial Groove <ul style="list-style-type: none"> here the radial nerve passes <p>The ulnar nerve enters the hand through Guyon's canal (also known as the ulnar canal). This canal is a groove located between the pisiform bone and the hook of the hamate bone. The ulnar nerve divides into superficial and deep branches within Guyon's canal. These branches provide both sensory and motor innervation to the hand</p> <ul style="list-style-type: none"> Pathway <ul style="list-style-type: none"> Exits through the fossa posteriorly Passes through the quadrangular space with posterior circumflex humeral artery
44	The lateral cutaneous nerve of the forearm arises from which terminal branch of the brachial plexus?	<p>A. Median</p> <p>B. Musculocutaneous</p> <p>C. Radial</p> <p>D. Ulnar</p>	<p>B</p> <p>Plate 465, Netter:</p> <p>The musculocutaneous nerve continues into the forearm as the lateral cutaneous nerve. It provides sensory innervation to the anterolateral aspect of the forearm, found close to the cephalic vein.</p>
45	After a radical mastectomy, a patient experiences difficulty in full extension, internal rotation, and adduction of the shoulder. What is the nerve affected?	<p>A. Long thoracic</p> <p>B. Thoracodorsal</p> <p>C. Medial pectoral</p>	<p>B*</p> <p>Injury to the long thoracic nerve causes winging of the scapula due to paralysis of the serratus anterior muscle, but it does not primarily affect extension, internal rotation, or adduction of the shoulder.</p> <p>The thoracodorsal nerve innervates the latissimus dorsi muscle, which is responsible for shoulder extension, internal rotation, and adduction. Damage to this nerve during a radical mastectomy can impair these movements, as the latissimus dorsi plays a key role in them.</p> <p>The medial pectoral nerve innervates the pectoralis major and minor muscles. Injury to this nerve affects shoulder flexion and adduction, but it does not primarily explain difficulty with extension, internal rotation, and adduction.</p>

	D. Lateral pectoral		This nerve innervates the pectoralis major and is involved in shoulder flexion and adduction, but it is not responsible for extension and internal rotation, as described in this case.
46	A. C5 and C6 B. C6 and C7 C. C8 and T1	C	C5-C6: Gives off the superior lateral cutaneous nerve of arm C8-T1: The medial cutaneous nerve of the forearm is a sensory branch of the medial cord of the brachial plexus. This is derived from the anterior rami of spinal nerves C8-T1 (See image).
47	What muscle is innervated by the Ulnar nerve	C	The ulnar nerve innervates the medial part of the flexor digitorum profundus , which controls the <u>flexion of the 4th and 5th digits (ring and little fingers)</u> . The lateral part of the flexor digitorum profundus (which controls the index and middle fingers) is innervated by the median nerve .
48	The cords of the brachial plexus are defined in relation to: A. Clavicle B. 2nd part of axillary artery C. Pectoralis minor D. Scalenus anterior	B	The cords are based on its location in relation to the axillary artery (Posterior cord is posterior to axillary artery, lateral cord is lateral to axillary artery and medial cord is medial to axillary artery)
49	The median nerve SOLELY innervates the intrinsic muscles of which of the following hand compartments? A. Central B. Hypotenar C. Interosseous D. Thenar	D	The nerve supply of the intrinsic muscles of the hand is the ulnar nerve EXCEPT for the thenar muscles (median nerve) and the 1st and 2nd lumbricals (median nerve) . The central compartment is composed of the 4 lumbricals and flexor tendons. Although the 1st and 2nd lumbricals are innervated by the median nerve, the 3rd and 4th lumbricals are innervated by the ulnar nerve; thus, the central compartment is NOT solely innervated by the median nerve.



50	The axillary nerve is injured due to an acute shoulder dislocation. Injury to the nerve will result in failure to what movement?	<p>A. Abduction</p> <p>B. Flexion</p> <p>C. Adduction</p> <p>D. Extension</p>	A	<p>The axillary nerve innervates the deltoid and teres minor muscles. These muscles are responsible for abducting the arm from 15 - 90 degrees.</p>
51	A 32-year old male has a spiral fracture in the distal 3rd of the right humerus. Upon examination at the ER, he was noted to have wrist drop on the affected extremity. What nerve is MOST LIKELY injured?	<p>A. Radial</p> <p>B. Median</p> <p>C. Anterior interosseous</p> <p>D. Ulnar</p>	A	<p>📋 Wrist Drop → Paralysis of the muscle supplied by the radial nerve would cause loss of function in the wrist and finger extensors causing it to drop or be in a flexed position.</p>
52	A 60-year old woman was brought to the ER after falling on an outstretched hand. Based on the physical examination, she has a fracture on the distal radius and a dinner fork deformity. What is MOST LIKELY the diagnosis?	<p>A. Nightstick</p> <p>B. Smith's</p> <p>C. Colles'</p> <p>D. Galleazi</p>	C	<p>📋 Nightstick fracture is an isolated fracture of the ulna as a result of direct hit/trauma. As the name implies, one of the mechanism of this injury is when a person is trying to block or shield themselves from an attack using their forearm, the ulna is usually the one at risk of being hit first by the attacker</p> <p>📋 Smith's Fracture is a fracture in the distal radius that is usually due to a fall with the wrist flexed in an inward direction. It is characterized by Volar angulation or displacement of fracture (reverse of Colles')</p> <p>📋 Colles' Fracture is a fracture in the distal radius that is usually due to a fall with the wrist flexed in an <u>outward direction</u>. It is characterized by a dorsal angulation/displacement of fracture and a 'dinner fork deformity' of the wrist</p> <p>📋 Galleazi Fracture is an isolated fracture of the radius (middle to distal 3rd), and is usually associated with a dislocation of Distal Radio-Ulnar Joint (DRUJ)</p>
53	When administering wrist block anesthesia, the median nerve is accessible between which of the following muscles?	<p>A. Flexor carpi ulnaris and palmaris longus</p> <p>B. Flexor carpi radialis and palmaris longus</p> <p>C. Flexor carpi ulnaris and flexor carpi radialis</p>	B	 <p>The median nerve passes through the carpal tunnel at the wrist and lies between the palmaris longus and flexor carpi radialis. This area renders the median nerve superficial, making it accessible for anesthesia and minimizing the risk of injuring deeper structures.</p>

		A. Flexor Pollicis Brevis, flexor digitorum profundus of the index and middle finger		
54	Aside from Pronator quadratus, which other muscles are paralyzed in the condition known as Benediction sign?	B. Flexor Pollicis Longus, flexor digitorum profundus of the index and middle finger	B	Hand of benediction can be caused by damage to either the ulnar or median nerve.
		C. Flexor Pollicis Brevis, flexor digitorum superficialis of the index and middle finger		The muscles specifically innervated by the ulnar nerve are the interossei, hypothenar, and two of the lumbrical muscles of the hand.
		D. Flexor Pollicis Longus, flexor digitorum superficialis of the index and middle finger		Flexor Pollicis Longus, Pronator Quadratus — innervated by Anterior interosseous Flexor digitorum muscle is innervated by ulnar nerve and anterior interosseous
55	Which of the following injuries is exhibited by the condition known as Mallet Finger	A. Fracture of the 5th metacarpal neck	C	This injury is exhibited by Boxer's Fracture . This type of fracture is usually sustained after punching hard surfaces, the excessive force directed on the knuckles has the tendency to break the metacarpal at the level of the metacarpal neck. 
		B. Fracture of the base of the thumb metacarpal		This injury is exhibited by Bennet's fracture . It is a result of an outstretched hand or axial loading along the thumb after a fall or direct trauma. 
		C. Rupture of the extensor tendon insertion of distal phalanx		
		D. Rupture of ulnar collateral ligament at the thumb MCP joint		This injury is exhibited by Game Keeper's Thumb also called Skier's Thumb . It usually manifests after a forceful abduction of the thumb at the level of metacarpophalangeal joint. 
56	Which superficial vein in the upper limb runs along the lateral side of the forearm and arm, eventually draining into the axillary vein?	A. Basilic	C	Located on the medial side of the forearm and arm; drains into the brachial vein
		B. Median Cubital		Connects the basilic and cephalic veins at the elbow
		C. Cephalic		
		D. Brachial		A deep vein in the upper arm that accompanies the brachial artery; does not run superficially or drain into the axillary vein directly.
57	Which of the following proteins is bound to one of the two membranes of the cell?	A. Integral	C	Bound to the outer AND inner leaflet of the phospholipid bilayer.
		B. Multipass		A type of integral protein. Hence, multipass proteins are bound to the outer AND inner leaflet of the phospholipid bilayer as well.
		C. Peripheral		Bound only to the outer OR inner leaflet of the phospholipid bilayer.

		D. Ribosomal		Site of protein synthesis. Bound to the endoplasmic reticulum NOT to the phospholipid bilayer.
58	Which type of endocytosis involves smaller invaginations of the cell membrane that transfers and entraps extracellular fluid and its dissolved contents?	A. Phagocytosis	B	Phagocytosis: type of endocytosis that involves the extension of surface folds that engulf particles and internalize this material into a cytoplasmic vacuole
		B. Pinocytosis		
		C. Receptor-mediated endocytosis		Receptor-mediated endocytosis: high-affinity binding of ligands to their receptors causes proteins to aggregate in special membrane regions that then invaginate and pinch off internally as vesicles
59	What organelle is primarily important for the biosynthesis of proteins and lipids?	A. Endoplasmic Reticulum	A	The ER is a major site for vital cellular activities, including biosynthesis of proteins and lipids. Numerous polyribosomes attached to the membrane in some regions of ER allow two types of ER to be distinguished.
		B. Lysosomes		
		C. Mitochondrion		
		D. Golgi Apparatus		
60	Which of the following structures differentiate rough endoplasmic reticulum from smooth endoplasmic reticulum?	A. Cisternae	C	Cisternae are flattened, membrane-bound sacs found in the endoplasmic reticulum and the Golgi apparatus <ul style="list-style-type: none">ER: presence of polyribosomes differentiate it from RER for protein synthesis and SER for lipid synthesisGA: involved in sorting, packaging, and transport of proteins and lipids
		B. Cristae		Cristae are inner foldings of mitochondrial membrane in eukaryotic cells
		C. Polyribosomes		Some regions in the endoplasmic reticulum bear polysomes (polyribosomes) appearing rough and other regions appearing smooth .
		D. Translocons		Regions of ER that lack bound polyribosomes make up the smooth endoplasmic reticulum (SER) .
				Translocons are protein pores in the RER <ul style="list-style-type: none">Not typically used to differentiate RER from SER since its structure cannot be seen microscopically.
61	The nuclear envelope begins to reassemble around each set of daughter chromosomes at which stage of mitosis?	A. Prophase	D	The nucleolus disappears and the replicated chromatin condenses into discrete threadlike chromosomes, each consisting of duplicate sister chromatids joined at the centromere.
		B. Metaphase		Chromosomes condense further and large protein complexes called kinetochores attach to the mitotic spindle. Cell is more spherical and microtubules move the chromosomes into alignment at the equatorial plate.
		C. Anaphase		Sister chromatids separate and move toward opposite spindle poles by a combination of microtubule motor proteins and dynamic changes in the lengths of the microtubules as the spindle poles move farther apart.
		D. Telophase		Microtubules of the spindle depolymerize

				and the nuclear envelope begins to reassemble around each set of daughter chromosomes.
62	DNA replication and histone synthesis is present in what phase in the cell cycle?	A. G1	B	The gap between M-phase and S-phase when the cell grows physically and increases volume of both protein and organelles
		B. S		The S phase is characterized by DNA replication, histone synthesis, and the beginning of centrosome duplication (Junquieira, 2018, pg 58)
		C. G2		Gap phase between S-phase and M-phase when the cell gets ready for Cell Division
		D. M		The M-phase is the freely observable part of the cell cycle and made up of two stages: Mitosis and Cytokinesis
63	In synapsis during prophase I, how many of each genetic sequence is present?	A. 1	D	During prophase I of the first meiotic division, the partially condensed chromatin of homologous chromosomes begins to come together and physically associate along their lengths during synapsis. Because each of the paired chromosomes has two chromatids, geneticists refer to synaptic chromosomes as tetrads to emphasize that four copies of each genetic sequence are present . [Junqueira]
		B. 2		
		C. 3		
		D. 4		
64	Which statement best describes apoptosis?	A. Cell ruptures and releases its contents	D	Apoptotic cells do not rupture and release none of their contents, unlike cells that die as a result of injury and undergo necrosis. Thus, it also not produce local inflammation - Cytochrome C is from the mitochondria not from the nucleus
		B. Cytochrome c from the nucleus activates the caspases		Apoptosis is controlled by cytoplasmic proteins in the Bcl-2 family , which regulate the release of death-promoting factors from mitochondria.
		C. There is local inflammation		
		D. Apoptotic cycle is regulated by the Bcl-2 family		
65	Which is the predominant junctional complex found in the mucosal epithelium of gallbladder that prevents bile from leaking into the peritoneal cavity?	A. Macula Adherens	C	AKA "Desmosome"; provides stability to cells, especially those under shearing stress
		B. Nexus		AKA "Gap/Communicating Junctions"; allows for rapid communication between cells
		C. Zonula Occludens		AKA "Tight Junctions"; Very tight— prevents bile from leaking . <ul style="list-style-type: none">• Tight junctions → AKA Zonula occludens → usually found on the apical surfaces of cells that act as barriers (eg. intestinal lining) → Fasten cells together & endow tissues with strength and stability • Also allow the passage of some molecules through the paracellular route ("leaks")
		D. Zonula Adherens		AKA "Adherens Junction"; Anchors cells closely to neighboring cells
66	Which epithelial surface has 9+0 arrangement?	A. Cilia	A	When cross-section is done in the middle portion: <ul style="list-style-type: none">• 9+2 arrangement: 9 doublets arranged peripherally and centrally around paired microtubules are called an axoneme.
		B. Microvilli		
		C. Stereocilia		When cross-section is done in the basal

				portion: • 9+0 arrangement: microtubules form triplets without axoneme.
67	Which of the following types of epithelium is always stratified?	A. Cuboidal B. Squamous C. Transitional D. Pseudostratified	C	Squamous, cuboidal, and pseudostratified epithelium are not always stratified. Transitional epithelium is composed of multiple layers of cells due to its function in areas that require elasticity and protection. Its appearance can change based on the degree of stretch.
68	Which of the epithelium tissue has the shortest period of cell renewal?	A. Simple columnar B. Stratified cuboidal epithelium C. stratified squamous keratinized epithelium D. transverse epithelium	A	Found in areas like the digestive tract (e.g., small intestine), and it has a high renewal rate (typically 2-6 days). slower renewal rate compared to simple columnar epithelium. Renewal takes longer compared to simple columnar, as the cells migrate from deeper layers to become keratinized. (28 days) Cell renewal is moderate compared to simple columnar, adapting to the expansion and contraction of organs like the bladder.
69	Simple squamous epithelium is mostly found in structures that functions for:	A. Diffusion B. Absorption C. Protection D. Secretion	A	Found in cardiovascular system: allows for passive transport of fluids, nutrients, and metabolites across the thin capillary walls to surrounding cells
70	Which of the following epithelium consist of a layer that have dead and anucleated epithelial cell	A. Pseudostratified columnar B. Stratified squamous nonkeratinized C. Stratified squamous keratinized D. Transitional	C	<p>Does not have real stratification All tall columnar cells rest on the basement membrane but at different heights; creating an illusion of stratification</p> <p>No keratinization at the upper surface of the epithelium</p> <ul style="list-style-type: none">Multiple layers: tall cells at the basal portion, cuboidal cells at the middle portion, flattened cells at the surface<ul style="list-style-type: none">Cells at the basal portion are the most immatureCells at the apical portion are the most mature <p>• Top portion is keratinized<ul style="list-style-type: none">Has keratin filaments with dead keratinocytes</p> <p>• Lack of nuclei in the top most layer (Thin lamellae, dead skin cells)</p> <p>• Function: Protection and prevention of water loss</p> <p>Designed to withstand a great degree of stretch and the toxicity of urine</p> <p>If relaxed,</p> <ul style="list-style-type: none">Not distendedHas features intermediate between stratified cuboidal and stratified squamous<ul style="list-style-type: none">Topmost layer: Dome-shaped<ul style="list-style-type: none">Also known as Umbrella CellsUsually binucleate

				If stretched, → Topmost layer will be flattened → Number of layers is reduced
71	In the organization of exocrine glands, the product of acini empties directly into which of the following duct?	A. Intercalated B. Interlobular C. Striated D. Main excretory	A	The intercalated duct is where the initial duct secretions are brought. After that, secretions are brought to the larger striated ducts and then to interlobular ducts (ducts in between lobes).
72	What type of gland secretion has serous demilunes?	A. Serous B. Mucous C. Mixed		Mixed gland contain both serous and mucous cells, with serous demilunes being crescent-shaped structures of serous cells that cap mucous acini.
73	What secretion type uses exocytic vesicles for product release?	A. Holocrine B. Merocrine C. Apocrine		Secretory portions become part of the secretion (sacrificed and formed part of the secretion) Secretions are released or brought to the duct via exocytosis (through the secretory vesicles) Part of the apical surface of the cell is pinched or released with the secretion of the gland
74	A gland with branched conducting and spherical-shaped secretory portions is classified morphologically as	A. Compound acinar B. Compound tubuloacinar C. Simple branched acinar D. Simple branched tubular		Several saclike secretory units with small ducts converge at a larger duct Ducts of both tubular and acinar secretory units converge at larger ducts Multiple saclike secretory parts entering the same duct Several long secretory parts joining to drain into 1 duct
75	Which junctional complex has an intracellular plaque anchored to an intermediate filament?	A. Focal Adhesion B. Hemidesmosome C. Nexus D. Zonula Adherens	B	Anchors actin filaments to the basement membrane Anchors intermediate filaments to the basement membrane Direct transfer of small molecules and ions from one cell to another Anchors the cell closely to neighboring cells, provide lateral adhesion
76	What collagen fiber makes up the basal lamina?	A. Type 3 collagen B. Type 4 collagen C. Type 6 collagen D. Type 7 collagen		Reticular fiber Thin layer that underlies epithelial cells - separates epithelial tissue from connective tissue Can be found in bone, cartilage, cornea, dermis Can be found under epithelial tissue
77	Which sarcoplasmic protein contains iron atoms and allows for oxygen storage?	A. Actin B. Calmodulin	D	Involved in muscle contraction, not related to oxygen or iron. Regulates calcium, no role in oxygen storage

		C. Hemoglobin	or iron. Contains iron and transports oxygen in blood, not for storage. Contains iron and stores oxygen in muscles, correct answer.																																				
		D. Myoglobin																																					
78	Which of the following BEST describes the regenerative ability of cardiac muscles?	A. Full B. Limited C. None	Smooth Muscle – Active regeneration; Highest regenerative capacity due to mitotic activity  Skeletal Muscle – Limited regeneration Cardiac Muscle – No regenerative capacity beyond early childhood 																																				
79	Which of the following is a smooth muscle?	A. Arrector pili B. Biceps brachii C. Endomysium D. Myocardium																																					
80	The triad 2 sarcoplasmic reticulum : 1 T-tubule is a characteristic of which type of muscle?	A. Skeletal B. Cardiac C. Smooth																																					
81	Which of the following is UNIQUE in smooth muscle?	A. Caveolae B. Endomysium C. Intercalated disc D. T-tubule	<p>Caveolae are small invaginations in the plasma membrane of smooth muscle cells that serve a similar function to T-tubules in skeletal and cardiac muscle.</p> <p>Endomysium is a delicate layer of connective tissue that surrounds individual skeletal muscle fibers.</p> <p>Intercalated discs are specialized connections between cardiac muscle cells, allowing synchronized contraction through gap junctions and desmosomes.</p> <p>T-tubules (transverse tubules) are invaginations of the cell membrane (sarcolemma) that penetrate deep into the muscle fiber in skeletal and cardiac muscles.</p>																																				
82	The cytoplasm of which part of the nucleus contains large masses of polysomes?	A. Axon B. Dendrite C. Perikaryon																																					
83	The thick filament of the sarcomere is composed of which protein?	A. Actin B. Myosin																																					
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			<ul style="list-style-type: none"> • Thick filament • 2 heavy and 4 light chains • Heads of heavy chains have: <ul style="list-style-type: none"> → CTP binding sites → ATPase activity
		C. Troponin	<p>TROPONIN</p> <ul style="list-style-type: none"> • 3 Globular subunits <ul style="list-style-type: none"> → Troponin C - attaches to calcium → Troponin T - attached to tropomyosin → Troponin I - regulates actin-myosin reaction (inhibitor)
		D. Tropomyosin	<p>TROPOMYOSIN</p> <ul style="list-style-type: none"> • Double-helix 2 polypeptide chains • Run in the groove between F-actin molecules
84	Which structure denotes ends of the smallest functional unit (contractile unit) of a muscle fiber?	A. A-Band B. H-Band C. M-line D. Z-disc	<p>D</p> <p>A-Band – Central portion of thick filament area</p> <p>H-Band – Central section of A-band without myosin heads; lighter mid region where filaments do not overlap</p> <p>M-line – Center of A-Band (binds each thick filament)</p> <p>Z-disc – dark transverse line that bisects the I-band; denotes the ends of the sarcomere</p>
85	Purkinje cells of the cerebellar cortex are classified as which of the following	A. Anaxonic B. Multipolar C. Bipolar D. Unipolar	<p>B</p> <p>Anaxonic neurons lack a distinct axon and are involved in local signaling.</p> <p>Multipolar neurons have one axon and multiple dendrites, allowing extensive connections.</p> <p>Bipolar neurons have two processes (one axon and one dendrite), commonly found in sensory pathways.</p> <p>Unipolar neurons have a single process that splits into two branches, typical in sensory neurons.</p>
86	Which of the following structures in a neuron is primarily responsible for the rapid conduction of action potentials through saltatory conduction?	A. Dendrites B. Cell body C. Nodes of Ranvier D. Axon terminals	<p>C</p> <p>Responsible for receiving signals from other neurons; not involved in action potential conduction.</p> <p>Contains the nucleus and organelles; processes signals but does not conduct action potentials.</p> <p>Gaps in the myelin sheath that allow action potentials to jump, facilitating rapid conduction. This is their primary function.</p> <p>Release neurotransmitters to communicate with other cells; not involved in the conduction of action potentials.</p>
87	What histologic event occurs FIRST after damage to the axon in the peripheral nervous system?	A. The distal axonal segment regenerates B. Oligodendrocytes form a myelin sheath C. Nucleus migrates centrally D. Perikaryon swells	<p>D</p> <p>The onset of regeneration is signaled by changes in the perikaryon that characterize the process of chromatolysis:</p> <ul style="list-style-type: none"> • Cell body <u>swells</u> slightly. • Nissl substance is initially <u>diminished</u>. • The nucleus migrates to a <u>peripheral</u> position within the perikaryon. <p>Oligodendrocytes are found in the CNS. In PNS, <u>Schwann cells</u> form myelin sheaths.</p>

		A. Ectoderm	C	Ectoderm – neurons and glial cells, including astrocytes and oligodendrocytes								
88	Microglia arises from which germ cell layer?	B. Endoderm		Endoderm – cells in the gastrointestinal tract, lungs, and liver								
		C. Mesoderm		Mesoderm – muscle, bone, blood, and connective tissues								
89	The regenerative capacity of connective tissues is dependent on the activity of what type of cell?	A. Fibroblast	A	Healing of incisions and other wounds depend on the reparative capacity of connective tissue especially on the activity and growth of fibroblast.								
		B. Leukocytes		First line of defense against antigens.								
		C. Mast Cell		Immune cells derived from the myeloid lineage								
		D. Mesenchyme		A meshwork of embryonic connective tissue								
90	Which of the following structural characteristics will classify the Connective Tissue Proper?	A. Abundance of Fibroblast cells	B	Not unique to one type of connective tissue as fibroblasts are present in various types of CT								
		B. Amount and pattern of Collagen fibers		<p>Table 6. Classification of Connective Tissue Summary</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Connective Tissue Proper</th> <th>Specialized Connective Tissue</th> <th>Embryonic Connective Tissue</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> • Loose CT (Areolar) • Dense CT <ul style="list-style-type: none"> → Dense Irregular → Dense Regular </td> <td> <ul style="list-style-type: none"> • Reticular CT • Adipose CT </td> <td> <ul style="list-style-type: none"> • loose Ct (Areolar) • Mesenchymal CT • Mucoid/ Mucous CT </td> </tr> <tr> <td style="text-align: center;">Amount and arrangement of collagen fibers</td> <td style="text-align: center;">Specific cells of protein fibers forming its distinct structural characteristics</td> <td style="text-align: center;">Abundance of ground substance</td> </tr> </tbody> </table>	Connective Tissue Proper	Specialized Connective Tissue	Embryonic Connective Tissue	<ul style="list-style-type: none"> • Loose CT (Areolar) • Dense CT <ul style="list-style-type: none"> → Dense Irregular → Dense Regular 	<ul style="list-style-type: none"> • Reticular CT • Adipose CT 	<ul style="list-style-type: none"> • loose Ct (Areolar) • Mesenchymal CT • Mucoid/ Mucous CT 	Amount and arrangement of collagen fibers	Specific cells of protein fibers forming its distinct structural characteristics
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Amount and arrangement of collagen fibers	Specific cells of protein fibers forming its distinct structural characteristics	Abundance of ground substance										
		C. Amount of Ground substance	Collagen fibers are a key element of all CT, thus it is not a defining characteristic that separates connective tissue proper from other CT types									
		D. Type of collagen present	Elastin is what elastic lamellae is made of Fibroblasts synthesize elastic lamellae in the connective tissue of the skin, not in the smooth muscle Elastin in vascular walls (e.g., aorta) synthesized by smooth muscle cells; in the CT of the skin synthesized by fibroblasts; in organs that expand (e.g., lungs, skin) synthesized by epithelial cells									
91	Elastic lamellae that form the walls of the aorta are synthesized by which cells?	A. Elastin	C	Aorta is not made of reticular cells								
		B. Fibroblasts										
		C. Smooth muscle										
		D. Reticular cells										
92	Network of thin delicate fibers attached with cells as demonstrated with silver stain histological appearance is descriptive of what	A. Elastic lamellae	C	Elastic fibers usually appear as thick, wavy structures that may take on a dark color when stained with special stains like Verhoeff-Van Gieson or Orcein, but not with a silver stain.								
		B. Collagen Bundles		Collagen bundles typically appear as thick, wavy fibers that are often pink or red with stains like Masson's trichrome or eosin in H&E stains.								
		C. Reticular fibers		Reticular fibers are thin, delicate fibers made primarily of type III collagen. They are often visualized using silver stains in histological preparations.								

93	Which constitutes the extracellular matrix of the connective tissue?	A. Collagen fibers + Fibroblast B. Collagen fibers + Glycosaminoglycans C. Fibroblast + Proteoglycans D. Proteoglycans + Glycosaminoglycans	B	Extracellular matrices consist of different combinations of protein fibers (collagen and elastic fibers) and ground substance (proteoglycans, glycosaminoglycans, and multiahesive glycoproteins).
94	Which histological features are typically observed in mast cells?	A. Eccentrically located nucleus with abundant lysosome B. Pale stained nucleus with numerous secretory granules C. Multilocular cytoplasm with centrally located nucleus D. Small elongated with dark stained nucleus	B	Mast cells have a centrally-located nucleus Histologic appearance of Mast Cells: → Cytoplasm: (+) basophilic secretory granules with chemical mediators, almost obscuring the pale centrally-located nucleus
95	A section of the thick skin shows which of the following histologic features?	A. Absent sweat glands B. Abundant sebaceous gland C. Elongated epidermal ridges D. Numerous hair follicle	C	Thick skin has well developed epidermal ridges (= elongated), numerous sweat glands, lack hair follicles and sebaceous glands
96	In which layer of the epidermis are melanocytes most concentrated?	A. Stratum Corneum B. Stratum Granulosum C. Stratum Spinosum D. Stratum Basale	D	20-30 layers of flattened cells (squames) filled with keratin filaments 3-5 layers of flattened cells containing granules Langerhan cells are mostly found in the stratum Spinosum. Melanocytes, the cells responsible for producing melanin, are most concentrated in the Stratum Basale.
97	The tonofibrils attached to desmosomes are more obvious during histological processing of which layer of the epidermis?	A. Stratum Granulosum B. Stratum Spinosum C. Stratum Lucidum D. Stratum Corneum	B	Stratum granulosum layer consists of three to five layers of flattened cells undergoing keratinization. Their cytoplasm is filled with intensely basophilic masses of keratohyalin granules. Routine histological preparation of this layer shrinks the cell allowing the visualization of desmosomes & their connection with tonofibrils within the keratinocyte. The short cytoplasmic projections are the tonofibrils. This layer is only found in thick skin. Nuclei and organelles have been lost, and cytoplasm consists almost exclusively of keratin filaments embedded in the matrix. Cells already lost their nuclei & cytoplasm, and are composed of only flattened, keratinized structures called squames.
98	Which of the following structures controls the direction of blood flow to and from the surface of	A. Arrector pili muscle	B	Arrector pili muscle: a tiny muscle connected to the surface of the skin that causes the hair

	the skin to regulate body temperature?		to stand when it contracts, forming "goosebumps" on the skin.
		B. Arteriovenous shunts	Arteriovenous shunts: are connections between arteries and veins that open or close to regulate blood flow to various parts of the body, regulating the body temperature.
		C. Capillary loops	Capillary loops: small blood vessels that facilitate the exchange of nutrients, gases, and waste products between blood and tissues. They can also influence blood flow, but they are not actively involved in controlling the direction of blood flow to regulate overall body temperature.
		D. Free nerve endings	Free nerve endings: sensory receptors that detect temperature, mechanical stimuli (touch, pressure, stretch), and nociception. Free nerve endings can sense changes in temperature, but they do not actively control blood flow to regulate body temperature.
99	Continuous proliferation and differentiation of cells occur in which of the following nail structures?	A. Hyponychium	Skin beneath the free edge of the nail. 📘 The distal end of the plate becomes free of the nail bed at the epidermal fold called the hyponychium .
		B. Eponychium	📘 Extension of epidermal stratum corneum that covers the nail root; also known as cuticle
		C. Nail Matrix	📘 Area where cells divide, move distally, and become keratinized. Forms nail root
		D. Nail Root	📘 Proximal part of the nail covered by nail fold; Matures and hardens as the nail plate
100	Which of the following elliptical encapsulated sensory receptor is found in the dermal papillae?	A. Merkel Cell	Intra-epidermal sensory receptors (low-threshold mechanoreceptors) for light/gentle touch sensation; unencapsulated
		B. Meissner Corpuscle	Initiate impulses when light touch/low-frequency stimuli temporarily deform their shape; encapsulated
		C. Pacinian Corpuscle	Concentric lamellae of flattened Schwann cells and collagen surrounding branched unmyelinated axons specialized for detecting coarse touch, sustained touch or pressure, vibrations with distortion of capsule
		D. Ruffini Corpuscle	Collagenous fusiform capsules anchored firmly to their surrounding connective tissues with sensory axons stimulated by stretch (tension) or twisting (torque) in the skin