STUDENT NAME: _____ STUDENT # _____

LAKEHEAD UNIVERSITY

EXAMINATION

Biology	2011	FA	Final
SUBJECT	COURSE NO.	SECTION	TYPE OF EXAMINATION

Human Musculoskel Anatomy

COURSE TITLE

December 15, 2012	6:00 p.m.	3 Hours	Gym
DATE OF EXAMINATION	TIME OF EXAMINATION	DURATION OF EXAMINATION	LOCATION

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INSTRUCTOR	EXAMINING DEPARTMENT

Authorized Memoranda | Materials

The student **MUST** count the number of pages in this examination question paper **BEFORE** beginning to write, and report any discrepancy immediately to a proctor.

This examination paper 15 has pages. This is PAGE 1.

This examination question paper MAY NOT be taken from the examination room.

Latin/Greek: __1__ - __26__

L. hook	__1__	L. -mys	__14__
L. shin	__2__	L. cheek	__15__
L. pea	__3__	L. arthros	__16__
L. line of soldiers	__4__	L. bolting together	__17__
L. pin (skewer-like)	__5__	L. fasciculus	__18__
L. vinegar cup	__6__	L. orbicularis	__19__
L. to run	__7__	L. relating to chest/breast b.	__20__
L. heel	__8__	G. saw	__21__
G. gaster	__9__	G. irregular, four sided	__22__
L. chondros	__10__	G. mm. of the loins	__23__
L. demos	__11__	L. buttock	__24__
L. resembling a wing	__12__	L. lifter	__25__
L. flat plate	__13__	L. chewer	__26__

Multiple Choice: __27___ - __86__

__27__ Identify the two mm. that are primarily responsible for biting:
- a) lateral pterygoid m. & masseter m.
- b) temporalis m. & lateral pterygoid m.
- c) temporalis m. & masseter
- d) temporalis m. & suprahyoid mm.

__28__ A conoid tubercle is present on the inferior surface of the lateral end of the
- a) sternum.
- b) scapula.
- c) clavicle.
- d) humerus.

__29__ Which is *not* a structural feature of the scapula?
- a) infraspinous fossa
- b) coracoid process
- c) acromion
- d) coronoid process

__30__ The head of the humerus articulates with the
- a) olecranon fossa
- b) glenoid cavity
- c) acromion
- d) subscapular fossa

__31__ Which is *not* a structural feature of the ulna?
- a) radial notch
- b) ulnar notch
- c) styloid process
- d) coronoid process

__32__ A styloid process is a structural feature of both
a) the ulna and radius.
b) the ulna and humerus.
c) the radius and scapula.
d) the radius and humerus.

__33__ Which of the following wrist bones articulates with the bones of the antebrachium?
a) scaphoid
b) capitate
c) lunate
d) trapezium
e) both a and c

__34__ The proximal row of carpal bones includes each of the following *except*
a) the pisiform.
b) the lunate
c) the triquetrum.
d) the trapezium.

__35__ Which is *not* true of the pelvic girdle?
a) It is firmly fused anteriorly and posteriorly.
b) It supports and protects the lower viscera
c) It consists of two os coxae which, in turn, are composed of six fused bones.
d) It is thinner and lighter in adult females than it is in adult males.

__36__ Which bone is not *one* of the three that form the os coxae?
a) pubis
b) ilium
c) symphysis pubis
d) ischium

__37__ The head of the femur articulates with the
a) glenoid cavity.
b) acetabulum
c) obturator foramen.
d) patella.

__38__ The medial malleolus is a process on the
a) tibia.
b) calcaneus.
c) fibula.
d) talus.

__39__ The largest tarsal bone is the
a) talus.
b) cuboid.
c) navicular.
d) calcaneus.

__40__ The distal row of tarsal bones includes each of the following *except*
a) the navicular.
b) the lateral cuneiform.
c) the cuboid.
d) the intermediate cuneiform.

__41__ Paralysis of the deltoid muscle causes:
a) Loss of abduction of the arm from zero to 15°.
b) Loss of abduction of the arm from 15° – 90°
c) Loss of abduction of the arm from zero to 90°.
d) Loss of abduction of the arm from 90° – 180°

__42__ Which of the following bones is incorrectly paired with its bony feature?
a) femur/linea alba
b) ilium/anterior superior iliac spine
c) ilium/ sciatic notch
d) tibia/intercondylar eminence

__43__ In one posterior surgical approach to the glenohumeral joint, an osteotomy of the greater tubercle is performed (separation from the humerus and reflection with its musculotendinous attachments intact). The reflected mm. include all the following EXCEPT the:
a) infraspinatus
b) subscapularis
c) supraspinatus
d) teres minor

__44__ A hip procedure that necessitates an osteotomy of the greater trochanter with reflection of the attached muscles to gain exposure would involve all of the following muscles EXCEPT the:
a) gluteus medius
b) gluteus minimus
c) iliopsoas
d) obturator internus
e) piriformis

__45__ Which of the following mm. of the ankle joint is a plantar flexor?
a) extensor digitorum longus
b) extensor hallucis longus
c) peroneus longus
d) peroneus tertius
e) tibialis anterior

__46__ The mm. of the anterior compartment of the leg are innervated primarily by which of the following nerves?
a) deep fibular
b) superficial fibular
c) common fibular
d) femoral
e) sciatic

__47__ The tendon of which of the following muscles is involved when the tuberosity of the fifth metatarsal bone is avulsed in an inversion fracture?
a) abductor digiti minimi
b) peroneus brevis
c) peroneus longus
d) tibialis anterior
e) tibialis posterior

__48__ Which of the following is false?
a) the medial end of the clavicle is the sternal extremity
b) the curvature of the medial one-third of the clavicle is convex anteriorly
c) the clavicle articulates medially with the body of the sternum and laterally with the acromion of the scapula
d) the clavicle is one of the most frequently fractured bone in the body

__49__ The bony landmarks commonly referred to as "knuckles" are the:
a) bases of proximal phalanges
b) heads of proximal phalanges
c) bases of metacarpals
d) heads of metacarpals

__50__ Of the mm. that move the forearm, two have points of origin on the scapula. One is the biceps brachii and the other one is the:
a) brachialis
b) brachioradialis
c) triceps brachii
d) anconeus

__51__ The following mm. all insert on the scapula. Which one does not adduct the scapula?
a) rhomboideus major
b) rhomboideus minor
c) trapezius
d) serratus anterior

__52__ The pectoralis minor m.
a) inserts on the greater tubercle
b) inserts on the acromion of the scapula
c) originates from ribs 3-5
d) originates from clavicle and sternum

__53__ Choose the false statement(s):
a) all three hamstring mm. have a site of origin on the ischial tuberosity
b) all three hamstring mm. are innervated by the tibial br. of the sciatic n. only
c) the biceps femoris is the lateral hamstring m.
d) the semimembranosus m. is deep to the semitendinosus m.

__54__ Which one of the following structures, if any, does not have an attachment to the ischium?
a) quadriceps femoris m.
b) adductor magnus m.
c) semimembranosus m.
d) obturator internus m.

__55__ The greatest range of mobility of any joint in the body is found in the
a) knee joint
b) hip joint
c) glenohumeral joint
d) elbow joint

__56__ A _____ is formed when two bones previously connected in a suture fuse.
a) gomphosis
b) synostosis
c) symphysis
d) syndesmosis

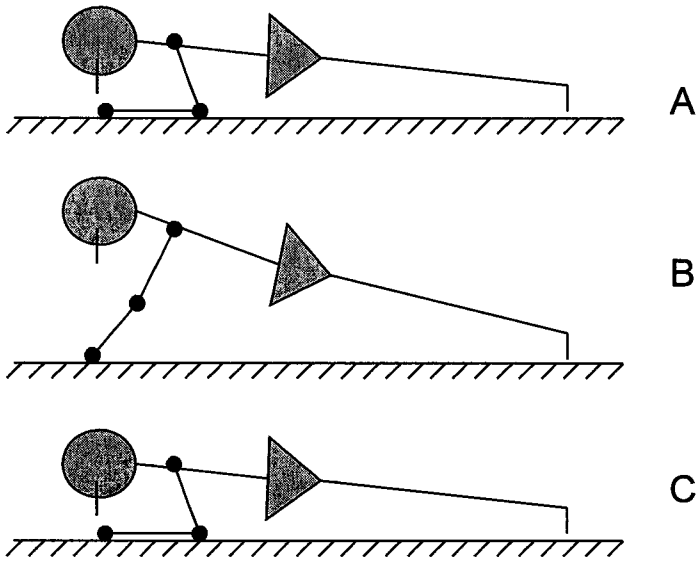
__57__ In a biaxial articulation,
a) movement can occur in all three planes
b) only circumduction occurs
c) movement can occur in two planes
d) movement can occur in only one plane

__58__ A metacarpophalangeal (MP) joint, which has oval articulating surfaces and permits movement in two planes, is what type of synovial joint?
a) condylar
b) plane
c) hinge
d) saddle

__58__ Which of the following is a function of synovial fluid?
a) lubricates the joint
b) provides nutrients for articular cartilage
c) absorbs shock within the joint
d) all of these are correct

__60__ All of the following movements are possible at the radiocarpal joint except
a) circumduction
b) abduction
c) flexion
d) rotation

Assume that an individual pushes himself up on the ground. Use the following figures to answer Question #61 to Question #63.



__61__ The motion from position A to position B is called _____ and that from position B to position C is called _____
a) elbow flexion, elbow flexion
b) elbow flexion, elbow extension
c) elbow extension, elbow flexion
d) elbow extension, elbow extension

__62__ Which of the following muscle actions is responsible for the motion from position A to position B?
a) concentric contraction of the brachialis muscle
b) eccentric contraction of the brachialis muscle
c) concentric contraction of the triceps brachii muscle
d) eccentric contraction of the triceps brachii muscle

__63__ Which of the following muscle actions is responsible for the motion from position B to position C?
a) concentric contraction of the brachialis muscle
b) eccentric contraction of the brachialis muscle
c) concentric contraction of the triceps brachii muscle
d) eccentric contraction of the triceps brachii muscle

**contractions that permit a m. to shorten are referred to as concentric contractions (biceps curl). Contractions that occur while m. is lengthening are called eccentric contractions (lunges)

__64__ Which of the following muscles does not cross both the shoulder joint and the elbow joint?

a. Biceps brachii
b. Triceps brachii
c. Coracobrachalis
d. Brachialis
e. C & D

__65__ Which of the following structures is not associated with its correct nerve of innervation?

a. Biceps brachii muscle - musculocutaneous
b. Sternocleidomastoid muscle - Spinal accessory (XI)
c. Deltoid muscle - Axillary nerve
d. Buccinator muscle - Facial (VII)
e. Lateral rectus - Trochlear n.

After studying Anatomy for the upcoming Christmas exam a second year Kinesiology student left the library at 12:00am and was mugged on his way home. During the attack the student held his arm up to protect his head and was knifed on his forearm. Subsequently, while waiting to be seen in the emergency room at the TBRHSC, the student realized that he could no longer **adduct** his thumb

__66__ He immediately concluded that the knife must have directly injured his:

a. Median n.
b. Radial n.
c. Unlar n.
d. Axillary n.

__67__ To confirm his diagnosis, the student should check for absence of sensation in which part of his hand:

a. Thumb
b. Little finger
c. Index finger
d. Middle finger

During a little league game one of the players accidently struck her teammate with her bat. When the bat hit the boy's arm there was an audible crack and the boy fell to the ground in pain. Luckily, one of the mothers watching was a physician and she rushed to the boy's aid. Quick examination revealed that the boy had a closed fracture in his upper arm.

__68__ After watching him have great difficulty **abducting** and rotating the arm, she diagnosed damage to the:

a) Musculocutaneous n.
b) Axillary n.
c) Ulnar n.
d) Radial n.

__69__ Damage to this nerve normally occurs when injury is located at the:

a) Lateral Epicondyle of the Humerus
b) Surgical Neck of the Humerus
c) Anatomical Neck of the Humerus
d) Deltoid Tuberosity of the Humerus

While rollerblading to school a third year medical student slipped on some wet pavement and crashed into a building. When he got up from his fall he noticed he could not support his right arm and he had lost feeling on his shoulder. As he slowly made his way to the hospital he reviewed his knowledge of the shoulder joint.

__70__ He remembered that the rotator cuff muscles associated with supporting the shoulder joint consist of all of the following **except**:

a) Supraspinatus m.
b) Infraspinatus m.
c) Deltoid m.
d) Teres minor m.

A fourth year medical student fell off a ladder while installing a flood light above his garage and put his arm through a garage door window. When he got up from his fall he realized the glass had deeply cut the anterior aspect of his wrist and so he decided to go to the nearest emergency room. During his trip to the ER he studied his wrist and began to make an initial diagnosis. Remembering his training, he initially assumed that the cut had affected all of the muscles in his wrist and he proceeded to examine all of them.

__71__Since he was able to flex the distal phalangeal joints of his four medial digits and his thumb, he concluded the following muscles were uninjured:

a) Palmaris Longus
b) Flexor Digitorum Profundus
c) Flexor Pollicus Longus
d) Flexor Carpi Radialis
e) Flexor Digiitorum Profundus and Flexor Pollicus Longus

__72__ He then concludes that the following nerve(s) to the muscle(s) must also be intact:

a) Ulnar
b) Radial
c) Ulnar and median
d) Median and radial
e) Median

__73__ On further inspection he notes an inability to flex the proximal interphalangeal joints of his four medial fingers. He concludes from this information that he has injured his:

a) Palmaris longus m.
b) Flexor carpi radialis m.
c) Flexor digitorum superficialis m.
d) Flexor carpi ulnaris m.
e) Two of the above mm.

While trying rollerblading for the first time, Muffy hit a curb and fell onto her outstretched left hand. When she got up and brushed herself off, she noted tenderness in her wrist in the area of her anatomical snuff box and was concerned she may have fractured one of the bones in her wrist.

__74__ The carpal bone forming part of the floor of the anatomical snuff box which is most often fractured is the:

a) Triquetral b.
b) Pisiform b.
c) Scaphoid b.
d) Lunate b.

__75__ The medial wall of the anatomical snuff box consists of the tendon from:

a) Extensor pollicus brevis m.
b) Flexor pollicus longus m.
c) Flexor carpi radialis
d) Extensor pollicus longus
e) Abductor pollicus longus

__76__ If Muffy did fracture one of her carpal bones in the snuff box of the wrist there might be a danger of bone necrosis. The artery travelling through the snuff box and supplying the bones in this area is the:

a) Radial Artery
b) Ulnar Artery
c) Median Artery
d) Thenar Artery

__77__ The connective tissue that divides the two rectus abdominis in the midline of the body is called the:

a) umbilicus
b) linea alba
c) rectus sheath
d) aponeurosis of the obliques

__78__ The gluteus maximus m.

a) provides propulsion by extending the knee during walking
b) acts in climbing the stairs by extending the thigh
c) adducts the thigh to stabilize the truck over the hip
d) pulls the trunk forward over the pelvis

__79__ Carpal tunnel syndrome involves the muscles of the:

a) pronators of the hand
b) extensors of the wrist
c) extensors of the hand
d) flexors of the wrist

__80__ Hamstrings have their origin from what structure?

a) ischial tuberosity
b) iliac spine
c) greater tuberosity
d) lesser tuberosity

__81__ The lateral compartment of the leg contains which m.?

a) tibialis posterior
b) flexor digitorum longus
c) fibularis longus
d) gastrocnemius

__82__ The large four-headed muscle of the thigh that extends the knee and flexes the hip:

a) biceps femoris
b) gluteus maximus
c) adductor magnus
d) quadriceps femoris

__83__The fleshy mass of muscle at the base of the little finger is called the

a) lumbrical eminence
b) interosseous eminence
c) thenar eminence
d) hypothenar eminence

__84__ Dislocation of the head of the radius in small children involves which structure?

a) lateral meniscus
b) collateral ligament
c) ulnar ligament
d) annular ligament

__85__ The important hand movement of having the thumb touch the fingertips is called:

a) reposition
b) pronation
c) opposition
d) supination

__86__ The movement when the fingers move toward the middle finger or median plane:

a) adduction
b) extension
c) flexion
d) abduction

True or False: __87__ - __114__

__87__ All twelve pairs of ribs have a head and tubercle for articulation with vertebrae.
__88__ In anatomical position, the femurs run parallel to each other.
__89__ The serratus anterior m. inserts on the lateral border of the scapula.
__90__ The capitulum of the humerus is lateral to the trochlea.
__91__ The posterior inferior portion of the coxal bone is the pubis.
__92__ The fibula, the lateral bone of the leg, is a weight-bearing bone.
__93__ The musculocutaneous n. innervates the biceps brachii and brachialis mm. only.
__94__ The deltoid m. forms the anterior axillary fold.
__95__ Joints that are relatively stable tend to have more mobility than joints that are less stable.
__96__ When the arm is in a supine position, the radius and ulna are parallel.
__97__ the adductor portion of the adductor magnus is innervated by the sciatic n.
__98__ the tibia is located on the anterolateral side of the leg.
__99__ the calcaneus articulates with the tibia and fibula.
__100__ the nutrient foramen of the tibia is the largest in the skeleton.
__101__ The scapula serves as an attachment site for a number of muscles.
__102__ The humerus is the longest bone in the body.
__103__ The brachium is the region of the forearm within the upper extremity.
__104__ Both the scapula and the ulna have a coracoid process.
__105__ The radius is the bone of the antebrachium that is located on the same side as the thumb.
__106__ The heads of the metacarpal bones form the knuckles of a clenched fist.
__107__ There are three bones in each digit of the hand.
__108__ The hand consist of 8 carpal bones, 5 metacarpal bones, and 14 phalanges.
__109__ The ilium is the largest of the pelvic bones.
__110__ The sciatic nerve and the femoral vessels pass through the large obturator foramen of the os coxae.
__111__ The femur is the longest, heaviest, strongest bone in the body.
__112__ The patella articulates with the femur, tibia, and fibula at the knee joint.
__113__ Each metatarsal bone has a proximal base, a body, and a distal head.
__114__ The ball of the foot is formed by the head of the first metatarsal bone.

Identify: __115__ - __158__

__115__ The m. in which a properly administered intragluteal intramuscular injection is made into.
__116__ A m. of the deep posterior compartment of the leg which does not act on the joints of the ankle and foot.
__117__ The m. which originates from the medial epicondyle of the humerus and turns the forearm so that the palm faces posteriorly.
__118__ The mm. which are used when forcibly lowering the raised upper limb.
__119__ The m. that extends the forearm and also aids in extension and adduction of the arm.
__120__ The m. which is closely related to the greater sciatic notch (foramen).
__121__ A m. that extends the knee and flexes the thigh at the hip and attaches to the anterior inferior iliac spine.
__122__ A secondary function of the temporalis m.
__123__ The principal ventral flexor of the trunk (paired).
__124__ The structure deep to the vastus intermedius m.
__125__ The first sphincter associated with the gastrointestinal (GI) tract.
__126__ The m. which attaches to the fascia of the neck/chest and to the inferior border of the mandible.
__127__ The specific portion of the sphincter mm. of the eye which is responsible for blinking.
__128__ The m. responsible for protrusion of the mandible.
__129__ The m. which if injured results in wryneck.
__130__ The m. whose tendon/fascia becomes aponeurotic and splits to form a sheath for the rectus abdominis m.
__131__ The abdominal m. whose fibres run inferomedially.
__132__ The m. which helps to compress abdominal viscera (coughing, etc.) and also assists to stabilize the pelvis during walking.
__133__ The m. responsible for extension of head and back and lateral flexion of head and vertebral column.
__134__ The flexor m. of the forearm that is not innervated by the median n. (or br. of).
__135__ The m. which initiates pronation and assists the pronator teres when more speed and power are needed.
__136__ The extensor m. of the forearm that actually flexes the forearm.
__137__ The m. responsible for "unlocking" the knee.
__138__ The m. of the anterior compartment of the thigh which is not innervated by the femoral n.
__139__ The "beef tenderloin" m.
__140__ The m. which is involved in periostitis of the tibia
__141__ The a. which is involved in anterior compartment syndrome
__142__ The procedure used to relieve pressure in the anterior compartment
__143__ The adductor m. which is not innervated by the obturator n.
__144__ The structure commonly injured in the "weekend warrier".
__145__ The muscle which initiates abduction of the arm.
__146__ The large, flat, triangular m. that elevates, retracts and depresses the scapula.
__147__ The m. which raises the body toward the arms when climbing.
__148__ The rotator cuff m. that medially rotates the humerus.

__149__ The specific head of the triceps brachii m. which attaches to the infraglenoid tubercle.
__150__ The portion of the adductor magnus that is innervated by the obturator n.

The n. that innervates the:
__151__ Gracilis m.
__152__ tensor fascia lata
__153__ Deltoid
__154__ Biceps femoris – short head
__155__ mm. of the lateral compartment of the leg
__156__ m. that attaches to the coracoid process and medial aspect of humerus - midshaft
__157__, __158__ the m. that flexes the DIP joints of digits 2-5.

More Identify: __159__ - __165__

__159__, __160__, __161__Three mm. that make up the erector spinae m. **(medial to lateral)**

__162__, __163__ The specific structures which articulate at the humeroulnar articulation.
__164__, __165__ The specific structures which articulate at the proximal radioulnar joint.

Clinical Corner: __166__ - __175__
A 67-year-old woman is brought to the Emergency department having fallen on her left arm. There is an obvious clinical deformity and X-ray demonstrates a mid-shaft fracture of the humerus. She has lost the ability to extend the left wrist joint.

__166__Which nerve has most likely been damaged with the fracture?

Following a left radical mastectomy (removal of breast and surrounding tissues), a 53-year old woman found that she was unable to raise her left arm above the head to comb her hair. During the physical examination, she was asked to face a wall and push hard against it with both outstretched hands. It was noted that the inferior angle and medial border of the left scapula projected markedly posteriorly during this maneuver.
__167__ Which nerve had been cut (or injured) during the mastectomy?

__168__ What muscle had been effected?

__169__ What is the term for this condition of the scapula?

A poorly conditioned 40 year old man started to play squash, particularly on weekends. At first he felt pain in his calcaneal tendon, and then he felt sudden calf pain. When the pain disappeared, he continued to play vigorously. He again felt calf pain and heard an audible snap. He had difficulty tiptoeing and climbing the stairs, but he found it easy to dorsiflex his ankle.

__170__ What do you think caused the audible snap and calf pain?

__171__ What physical sign would you expect to observe?

__172__ Why did he have trouble tiptoeing and climbing stairs?

While playing in a Bantam AA hockey game, a 14 year old boy was accidentally kicked with a skate on the lateral surface of his right leg just inferior to the knee. The superficial wound was treated by the trainer, but the man was unable to continue playing because of pain in the region of the laceration and loss of power in his leg and foot. He also experienced numbness and tingling on the lateral surface of his leg and the dorsum of his foot. When he removed his skate, he found that he was unable to move his right foot or his toes superiorly (dorsiflex). He was advised to see his physician immediately. As he walked into the examining room, you (using your KIN/BIOL degree as a stepping stone into Sports Medicine, you are shadowing an ER doctor to gain experience) observed that he had an abnormal gait - he raised his right foot higher than usual and brought it down suddenly, making a clopping noise. During the initial physical examination, you detected tenderness over the head and neck regions of the patient's fibula and a sensory deficit on the lateral side of the distal part of his leg, including the dorsum of his foot. Radiographs were taken. The diagnosis was a fracture of the neck of the fibula and a peripheral nerve injury. The doctor, knowing you were studying for your Christmas exam in anatomy, decides to help you prepare by quizzing you on your knowledge of gross anatomy. He asks you the following questions regarding this case:

__173__ What nerve appears to have been injured?

__174__ What is the name given to the foot condition exhibited by the patient when he walked?

__175__ What movement of the toes will be effected?