ST MARY’S UNIVERSITY

TWICKENHAM, LONDON

BSc Degree Examination students registered for

Level **FOUR**

Title: **Physiology and Anatomy**

Code: **HEP4011**

Semester: **ONE**

Date: **January 7th 2019**

Time: **1:30 – 3:30PM**

TIME ALLOWED: **TWO** HOURS

Please answer **ALL** questions on the separate form.

If an error occurs please put an **‘X’** thorough the incorrect response, followed by the amended answer.

You can change your mind multiple times, however, please ensure there is **ONE** clear answer. Answer **ALL** questions. Write your Regnum on **ALL** pages

1. Which of the following is replaced by bone during growth?

a) Hyaline cartilage

b) Compact bone  
c) Periosteum   
d) Elastic cartilage

2. Bone is formed from a process called …...?

a) Peristalsis  
b) Haematology   
c) Ossification   
d) Synapses

3. Which is the strongest type of cartilage?

a) Hyaline  
b) Fibrocartilage  
c) Elastic cartilage  
d) None of the above

4. Two or more moveable bones are connected with which of the following?

a) Tendon  
b) Cartilage  
c) Muscle  
d) Ligament

5. Which of the following affects bone growth/structure?

a) Nutrition  
b) External loading  
c) Genetics  
d) All of the above

6. The breakdown of bone is undertaken by which of the following?

a) Osteoblasts

b) Osteoclasts

c) Osteocyte

d) All of the above

7. Which mineral is required for healthy bone growth?

a) Vitamin B  
b) Calcium  
c) Magnesium  
d) Creatine

8. Messages passed via the endocrine system are:

a) Electrical   
b) Electrical and chemical messengers  
c) Chemical messengers  
d) Action potential

9. The maintenance of physiological balance within the human body is maintained through a process called:

a) Homostatic  
b) Homeostasis  
c) Equistasis  
d) The Sliding Filament Theory

10. Hormones…

a) act as chemical messengers within the blood   
b) generate muscular contractions   
c) send electrical signals   
d) all of the above

11. Which type of hormones diffuse easily through cell membranes?

a) Non-steroid hormones  
b) Protein/peptide hormones  
c) Steroid hormones  
d) All of the above

12. Which gland secretes epinephrine and norepinephrine?

1. Pituitary gland
2. Adrenal gland
3. Thyroid gland
4. Pancreas

13. The Central Nervous System is composed of which of the following?

a) Brain and nerves  
b) Brain and spinal cord  
c) Nerves running to and from spinal cord  
d) Nerves running to and from the brain

14. The somatic nervous system and autonomic nervous system are part of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

a) parasympathetic nervous system  
b) sympathetic nervous system   
c) peripheral nervous system  
d) central nervous system

15. A neuron is composed of a cell body and \_\_\_\_\_\_\_\_\_\_\_

a) Axon  
b) Motor nerve  
c) Cerebellum   
d) Hypothalamus

16. What is the name of the functional contact between two neurones or a neuron and an effector?

a) Synapse

b) Dendrites

c) Medulla

d) Axon

17. What are the key functions of muscle tissue?

a) Locomotion, flexibility and mobility   
b) Locomotion and thermogenesis  
c) Thermogenesis, stabilisation and blood cell production

d) Thermogenesis, stabilisation and locomotion

18. Which of the following activities involve the action of smooth muscle?

a) Stomach moving food and the heart contracting   
b) Contraction of bladder for urination and exercising

c) Stomach moving food and bladder contraction for urination  
d) Lifting a heavy object and the heart contracting

19. What is the function of thermogenesis?

a) To deliver calcium to the muscle cells   
b) Generate heat to maintain the body’s core temperature  
c) Provide stabilisation to the body  
d) Allow the heart to maintain a constant rhythm

20. Contractibility of muscles means:

a) Ability to respond to certain stimuli   
b) Ability to thicken and shorten

c) Ability to extend (without) damaging tissue  
d) Ability to return to original shape after contraction/extension

21. Muscle extensibility is:

a) Ability to respond to certain stimuli

b) Ability to shorten and thicken, thus generating force to do work  
c) Ability to stretch without damaging the tissue  
d) Ability of muscle to return to its original shape

22. The outer layer of skeletal muscle is called \_\_\_\_\_\_\_\_\_\_

a) endomysium  
b) myofibrils  
c) epimysium  
d) actin

23. What are the two main parts of the cardiovascular circulatory system?

a) Pulmonary and ventilator circuits

b) Pulmonary and systemic circuits

c) Venal and arteriole

d) Artery and venule

24. What is the stroke volume?

a) Number of times the heart contracts per minute

b) The volume of blood pumped around the body per minute

c) The volume of blood pumped during one heart beat

d) The volume of blood delivered to the lungs

25. Which of the following part of the heart receives oxygenated blood via the pulmonary veins?

a) Right ventricle

b) Right atrium

c) Left ventricle

d) Left atrium

26. What is the role of the semilunar valves?

a) maintain the rhythm of the heart

b) oxygenate the blood

c) prevent backflow of blood into the ventricles

d) prevent backflow of blood into the atria

27. Which of the following receives deoxygenated blood via the vena cava?

a) Right ventricle

b) Right atrium

c) Left ventricle

d) The lungs

28. Which part of the heart is composed of thicker cardiac muscle (myocardium)?

a) SA Node

b) Left ventricle

c) Aorta

d) Pulmonary vein

29. During vigorous exercise where is most of the blood supply distributed?

a) The heart

b) Skin

c) The brain

d) Skeletal muscles

30. Which of the following initiates the initial electrical impulse during contraction of the heart?

a) Aorta

b) AV node

c) SA node

d) Purkinje fibres

31. What is the name of the functional unit of the kidney?

a) Nephritis

b) Nephron

c) Renal corpuscle

d) Renal tubule

32. Where does the filtration of the blood occur in the kidney?

a) Glomerulus

b) Renal tubules

c) Proximal convoluted tubule

d) Urethra

33. Where does most of the fluid reabsorption in the kidneys occur?

a) Pulmonary vein

b) Renal tubules

c) Bowman’s capsule

d) Renal capsule

34. What is the name of the tubule which leads from the kidney to the bladder?

a) Ureter

b) Urethra

c) Proximal convoluted tubule

d) Distal convoluted tubule

35. Where does gaseous exchange take place?

a) Epiglottis

b) Electron transport chain

c) Alveoli

d) Trachea

36. Which of the following is the correct order for the movement of air from the outside into the body?

a) Nasal passage > pharynx > larynx > trachea > bronchioles > lungs

b) Nasal passage > pharynx > trachea > larynx > bronchioles > lungs

c) Epiglottis > nasal passage > pharynx > trachea> larynx > bronchioles > lungs

d) Pharynx > epiglottis > trachea > larynx > bronchioles > lungs

37. What structures are located in the lungs?

a) Bronchioles, trachea, alveoli

b) Bronchi, bronchioles, alveoli

c) Bronchi, bronchioles, pharynx, alveoli

d) Diaphragm, trachea, bronchi

38. What is an important characteristic of the lungs?

a) Large surface area

b) High hydrostatic pressure

c) Dry surface area

d) All of the above

39. Which of the following is an enzyme found in saliva?

a) Amylase

b) Proteinases

c) Insulin

d) ATPase

40. Which of the following shows the correct order for movement of food during digestion?

a) Mouth, pharynx, stomach, oesophagus, small intestine, large intestine

b) Mouth, pharynx, oesophagus, stomach, small intestine, large intestine

c) Mouth, pharynx, oesophagus, stomach, large intestine, small intestine

d) Mouth, oesophagus, pharynx, stomach, large intestine, small intestine

41. What type of muscle is responsible for peristalsis in the oesophagus and stomach?

a) Striated

b) Cardiac

c) Smooth

d) Involuntary

42. Where does most of the absorption of nutrients occur in the gastrointestinal tract?

a) Large intestine

b) Oesophagus

c) Small intestine

d) The liver

43. Insulin produced by the pancreas…

a) promotes uptake of glucose from the blood

b) promotes glycogen breakdown in the liver

c) promotes emulsification of fats

d) promotes the formation of bile

44. The lining of the small intestine is covered in …

a) microvilli

b) chyme

c) amylase

d) papillae

45. An ATP molecule is composed of:

a) oxygen, nitrate, and phosphorus atoms

b) carbon, hydrogen, nitrogen, oxygen, and phosphorus atoms

c) amino acids, oxygen, and phosphorus atoms

d) triphosphate and phosphorus atoms

46. The aerobic system can be broken down into which three components:

a) Glycolysis, Krebs cycle, action potential

b) Anaerobic glycolysis, Krebs cycle, ATP-PCr

c) Glycolysis, Krebs cycle, anaerobic glycolysis

d) Glycolysis, Krebs cycle, electron transport chain

47. Which of the following are products of aerobic respiration?

a) Oxygen, carbon dioxide

b) Carbon dioxide, water

c) Carbon dioxide, lactic acid

d) All of the above

48. What dominant factor determines which fuel substrate is used during exercise?

a) Intensity

b) Carbohydrate metabolism

c) Fat metabolism

d) Level of fitness

49. In the aerobic respiration of glucose, \_\_\_\_\_\_\_\_\_\_ is formed by\_\_\_\_\_\_\_\_\_\_

a) lactic acid, the mitochondria

b) pyruvic acid, the Krebs cycle

c) glycogen, the Krebs cycle

d) pyruvic acid, glycolysis

50. The Femur is a \_\_\_\_\_\_bone, its articulation with the tibia at the knee is an example of a \_\_\_\_\_\_\_ joint.

1. Long, pivot
2. Long, hinge
3. Short, condyloid
4. Short, pivot

51. Each of the innominate bones, is comprised of which three fused bones?

a) Ischium, Iliac crest, pubic symphysis

b) Ilium, Ischial tuberosity, pubic symphysis

c) Ilium, Ischium, pubis

d) Ilium, Ischium, pubic symphysis

52. Broadly, joints can be classified into 3 types, these are:

1. Synovial, fibrous, cartilaginous
2. Condyloid, fibrous, saddle
3. Synovial, fibrous, synchondrosis
4. Fibrous, synchondrosis, synovial

53. The \_\_\_\_\_\_ and \_\_\_\_\_\_ are examples of fibrous joints.

1. Sternomanubrial, elbow
2. Superior tibiofibular, symphysis pubis
3. Radioulnar, knee
4. Sutures of the skull, syndesmosis between tibia and fibular

54**.** The metacarpal phalangeal joint (knuckle) is an example of what type of synovial joint?

1. Condyloid
2. Pivot
3. Saddle
4. Ball and socket

55. The articular surfaces of the hip are the\_\_\_\_\_\_\_\_ and the\_\_\_\_\_\_\_\_.

1. Head of the femur, acetabulum
2. Neck of the femur, iliac fossa
3. Femoral condyle, acetabular labrum
4. Head of the femur, acetabular labrum

56. The patella is an example of a \_\_\_\_\_\_\_\_\_ bone

a) Sesamoid

b) Irregular

c) Short

d) Long

57. The knee joint is formed by the articulations of which 3 bones?

a) Patella, Fibular head, Tibia

b) Femur, Fibular head, Tibia

c) Femur, Tibia, Patella

d) Femur, Tibia, Talus

58. What are the four most important ligaments for stabilising the knee?

1. Anterior crucial ligament, Posterior crucial ligament, Medial collateral ligament, lateral collateral ligament.
2. Anterior cruciate ligament, Posterior cruciate ligament, Medial crucial ligament, Lateral crucial ligament.
3. Anterior collateral ligament, Posterior collateral ligament, Medial cruciate ligament, Lateral cruciate ligament.
4. Anterior cruciate ligament, Posterior cruciate ligament, Medial collateral

ligament, Lateral collateral ligament.

59. The Glenohumeral joint is formed via the articulations of the \_\_\_\_\_\_\_\_\_ and the \_\_\_\_\_\_\_\_\_\_

1. Condyloid, glenoid labrum, humeral condyle
2. Ball and socket, glenoid labrum, humeral condyle
3. Humeral head, glenoid fossa
4. Condyloid, humeral head, glenoid fossa

60.The Glenohumeral joint is an example of a \_\_\_\_\_\_ joint.

1. Condyloid
2. Ball and socket
3. Hinge
4. Saddle

61. The bony landmarks of a vertebra include:

1. Vertebral condyle, spinous notch, transverse process
2. Vertebral condyle, spinous process, transverse arch
3. Vertebral body, spinous notch, transverse arch
4. Vertebral body, spinous process, transverse process

62. The extensor muscles of the hip include:

1. Rectus femoris, Extensor femoris, Gracilis
2. Gluteus maximus, Gluteus minimus, Extensor femoris
3. Gluteus maximus, Biceps femoris, Semimembranosus, Semitendinosus
4. Biceps femoris, Rectus femoris, Iliocostalis

63. Dynamic stability at the shoulder, is provided largely by the muscles of the rotator cuff, these are………

1. Subscapularis, Supraspinatus, Rotatoris, Teres major
2. Supraspinatus, Infraspinatus, Teres minor, Subscapularis
3. Infraspinatus, Teres minor, Serratus anterior, Subscapularis
4. Rotator humerus, Infraspinatus, Teres minor, Subscapularis

64. Which rotator cuff muscle is a medial rotator of the Glenohumerlal joint?

1. Subscapularis
2. Supraspinatus
3. Teres minor
4. Infraspinatus

65. Teres minor arises…………. and inserts on the greater tubercle of the humerus.

1. From the entire anterior surface of the subscapular fossa
2. Anteriorly on the medial two thirds of the Supraspinous fossa
3. Medial aspect of the infraspinous fossa, just below the spine of scapula
4. Posteriorly on the upper & middle aspects of the lateral scapula border

66. Subscapularis originates from the anterior surface of the\_\_\_\_\_\_\_\_\_\_

1. Glenoid fossa
2. Supraspinous fossa
3. Subscapular fossa
4. Infraspinous fossa

67. Supraspinatus inserts onto the superior aspect of the \_\_\_\_\_\_\_\_\_

a) Greater tubercle of the humerus

b) Lesser tubercle of the humerus

c) Greater trochanter

d) Bicipital groove

68. Rectus Abdominus originates from the crest of the pubis and inserts on.....

1. Transverse process of C7, clavicle
2. Costotranverse joint of ribs 1-4, scapula
3. Cartilage of ribs 5-7, xiphoid process
4. Clavicle, xiphoid process

69. The flexors of the spine include …….

1. Quadratus lumborum, Erector spinae, Gluteus maximus
2. Rectus abdominus, External obliques and Internal obliques
3. Rectus femoris, Flexor spinalis, Flexor lumborum,
4. Flexor spinae, Flexor digitorum longus, Rectus abdominus

70. The intrinsic extensors of the spine are collectively known as the….

1. Extensor spinae
2. Rectus spinae
3. Spinalis extensoris
4. Erector spinae

**END OF EXAMINATION**

**Multiple Choice Questions Answer Sheet HEP4011:**

**Regnum……………………………………..**

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**END OF EXAMINATION**