



Class: XI

Time Allowed: 20 minutes

**MODEL PAPER EXAMINATION 2025**  
**SUBJECT: ANATOMY & MICROTECHNIQUES**
**SECTION "A"****Marks: 17**
**Note:** Attempt **ALL** questions from this section. Each question carries **ONE** mark.

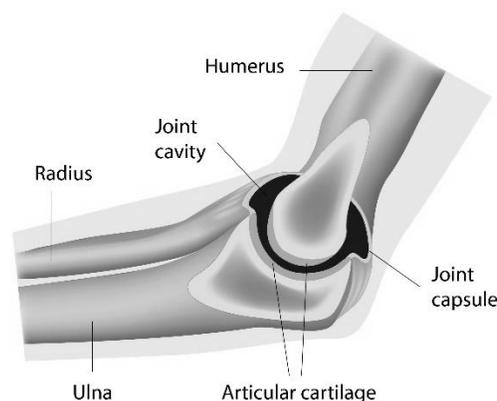
1. Which body system removes waste products from the blood and maintains water and electrolyte balance?
  - A. Urinary system
  - B. circulatory system
  - C. digestive system
  - D. respiratory system
2. Which layer of the meninges is closest to the brain's surface?
  - A. Hinge joint
  - B. Ball and Socket joint
  - C. Pivot joint
  - D. Condylod joint
3. If a patient is lying on their back, this position is known as:
  - A. Prone
  - B. Lateral
  - C. Supine
  - D. Medial
4. Which abdominal region is primarily associated with the liver and gallbladder?
  - A. Epigastric region
  - B. Right Hypochondriac region
  - C. Umbilical region
  - D. Left hypochondriac region
5. Which cellular component acts as a selective barrier, regulating the gentry and exit of substances?
  - A. Nucleus
  - B. Cytoplasm
  - C. Cell membrane
  - D. Mitochondria
6. The pelvic cavity primarily contains which organs?
  - A. Heart and lungs
  - B. Reproductive organs and bladder
  - C. Brain and spinal cord
  - D. Stomach and liver
7. What is the correct path through the circulatory system which describes the passage of blood originating in the left leg?
  - A. Vena cava → left atrium → right atrium → lungs → left ventricle → right ventricle → aorta
  - B. Vena cava → right atrium → left atrium → lungs → right ventricle → left ventricle → aorta
  - C. Vena cava → left atrium → left ventricle → lungs → right atrium → right ventricle → aorta
  - D. Vena cava → right atrium → right ventricle → lungs → left atrium → left ventricle → aorta
8. The heart is enclosed in a protective sac called the:
  - A. Pericardium
  - B. Pleura
  - C. Peritoneum
  - D. Myocardium
9. Which enzyme in saliva breaks down starches into sugars?
  - A. pepsin
  - B. lipase
  - C. amylase
  - D. trypsin
10. Which hormone is produced by the pancreas to regulate blood sugar levels?
  - A. Insulin
  - B. Thyroxin
  - C. Cortisol
  - D. Adrenaline
11. The hormone melatonin, produced by the pineal gland, is associated with:
  - A. Sleep-wake cycles and circadian rhythms
  - B. Blood sugar regulation
  - C. Immune system function
  - D. Bone development
12. Oxytocin and ADH are produced by the \_\_\_\_\_ and stored in the \_\_\_\_\_.
  - A. Posterior pituitary; Anterior pituitary
  - B. Adrenal cortex; Adrenal medulla
  - C. Hypothalamus; Neurohypophysis
  - D. Adenohypophysis; Kidneys
13. What is the function of the seminal vesicle in the male reproductive system?
  - A. Sperm storage
  - B. Secretion of alkaline fluid
  - C. Sperm maturation
  - D. Production of testosterone
14. What is the function of ligaments in the musculoskeletal system?
  - A. Connect muscle to bone
  - B. Facilitate joint movement
  - C. Connect bone to bone
  - D. Store minerals
15. Which type of muscle is responsible for involuntary movements like digestion?
  - A. Smooth muscle
  - B. Cardiac muscle
  - C. Skeletal muscle
  - D. Ligaments
16. Which type of joint allows movement in multiple planes, including flexion, extension, abduction, and adduction?
  - A. Ball and Socket joint
  - B. Hinge joint
  - C. Condylod joint
  - D. Pivot joint
17. Which process involves the elimination of concentrated urine from the body?
  - A. absorption
  - B. Selective reabsorption
  - C. micturition
  - D. glomerular filtration

Time Allowed: 30 minutes

**Practical Based Assessment (PBA)****(Marks: 15)**

18. A student is examining a cross-section of the diaphragm. To identify the "Central Tendon," where should they look and what is its primary functional characteristic?
- The peripheral edges; it is the site of muscular origin.
  - The posterior region; it anchors the muscle to the lumbar vertebrae.
  - The superior central region; it is an aponeurosis that does not contract itself.
  - The inferior surface; it contains the pleural membranes.
19. -A student sets up four test tubes containing starch solution and various additives at 37°C. After 20 minutes, Iodine solution (which turns blue-black in the presence of starch) is added. In which tube will the solution remain brown/yellow, indicating successful enzymatic action?
- Tube A: Starch + Boiled (denatured) Amylase
  - Tube B: Starch + Amylase + pH 7 Buffer
  - Tube C: Starch + Distilled Water
  - Tube D: Starch + Amylase + pH 2 (Highly Acidic) Buffer
20. During a hand-washing practical using UV-sensitive "germ juice," a student notices that the areas around the fingernails still glow after a quick five-second wash. Which digestive health risk is most directly associated with this specific hygiene failure?
- Increased production of salivary amylase.
  - Ingestion of pathogens that can lead to acute gastroenteritis.
  - Reduced absorption of fat-soluble vitamins in the small intestine.
  - Irritation of the esophageal lining due to acid reflux.
21. While examining a histological slide of a cross-sectioned neurovascular bundle, you observe a vessel with a very thick tunica media and a relatively small, circular lumen. What functional characteristic is directly supported by this specific anatomy?
- Providing a large surface area for the rapid diffusion of gases.
  - Sustaining and resisting the high hydrostatic pressure generated by ventricular contraction.
  - Utilizing internal valves to prevent the backflow of blood under low pressure.
  - Acting as a primary reservoir for the majority of the body's blood volume.
22. A student is using a probe to trace the path of deoxygenated blood entering the heart from the lower extremities. Which structure must the probe pass through first to enter the Right Atrium?
- Superior Vena Cava
  - Pulmonary Vein
  - Inferior Vena Cava
  - Aorta
23. You are asked to identify the valve located between the Left Atrium and the Left Ventricle. On a model, this valve is characterized by two fibrous flaps (cusps). What is its correct anatomical name?
- Tricuspid Valve
  - Bicuspid (Mitral) Valve
  - Pulmonary Semilunar Valve
  - Aortic Semilunar Valve
24. A student is observing a mechanical model of the human knee. The model restricts movement to a single plane (flexion and extension), similar to the opening and closing of a door. Which joint classification does this represent?
- Pivot joint
  - Condylloid joint
  - Hinge joint
  - Ball and socket joint
25. A student is examining the elbow joint on an anatomical model. They observe that the joint only allows for bending (flexion) and straightening (extension) along a single plane, similar to a door. What is the correct classification for this uniaxial movement?

### The Elbow Joint



- Pivot joint
- Hinge joint
- Condylloid joint
- Ball and socket joint

26. A student is tracing the "Pathway of Sperm" on a flow chart. After leaving the Vas Deferens (Ductus Deferens), the sperm enters a structure that passes directly through the center of the Prostate Gland. What is the role of the secretions added at this specific anatomical junction?
- To produce a lubricating mucus that cleanses the urethra of urine.
  - To contribute a milky, slightly acidic fluid that helps activate sperm.
  - To house the developing spermatids during their final stage of meiosis.
  - To provide the primary protective covering for the testes.
27. While examining a frontal view diagram of the internal reproductive organs, you notice a narrow inferior portion of the uterus that projects into the vaginal canal. What is the correct label for this "neck-like" structure?
- The Fallopian Tube
  - The Corpus Luteum
  - The Cervix
  - The Perimetrium
28. While observing a muscle tissue sample under  $400\times$  total magnification (using a  $10\times$  eyepiece and a  $40\times$  objective), the image appears blurry. Which part of the microscope should the student adjust to bring the internal cellular structures into sharp focus?
- The Coarse Adjustment Knob
  - The Diaphragm/Iris Lever
  - The Revolving Nosepiece
  - The Fine Adjustment Knob
29. During a histopathology lab, a technician needs to preserve a large organ sample for routine light microscopy and long-term storage. Which "universal" fixative is most appropriate because it penetrates tissues deeply and allows for a wide range of subsequent staining techniques?
- Formaldehyde (10% Neutral Buffered Formalin)
  - Chloroform-Methanol mixture
  - Osmium Tetroxide
  - Heat Fixation via Bunsen burner
30. In a diagnostic report for a skin lesion, the pathologist uses Immunohistochemistry (IHC) to detect the presence of S-100 proteins. Why is this specific laboratory skill used to supplement a standard H&E stain?
- To definitively identify the cell of origin (e.g., melanocytes) in poorly differentiated tumors.
  - To increase the magnification of the microscope beyond  $1000\times$ .
  - To visualize the cell wall which is otherwise invisible in human cells.
  - To measure the exact glucose levels within the interstitial fluid.
31. During the "Clearing" stage of tissue processing, a student uses Xylene to remove the dehydrating agent. What is the primary physical sign that the clearing process has been successful and the tissue is ready for infiltration?
- The tissue sample becomes completely opaque and white.
  - The tissue sample turns dark brown or black.
  - The tissue sample becomes translucent or "clear" in appearance.
  - The tissue sample increases in size by absorbing the solvent.
32. You are presented with a slide of connective tissue stained with "Masson's Trichrome." In this specific staining protocol, the collagen fibers appear bright blue, while the muscle fibers appear red. If the blue stain is missing, what diagnostic conclusion would a student likely struggle to make?
- Identifying the presence of a viral infection within the cells.
  - Distinguishing between muscular tissue and the supporting extracellular matrix.
  - Calculating the total number of red blood cells in a vessel.
  - Determining the pH level of the surrounding interstitial fluid.

**END OF SECTION A**


 Class: XI  
 Time: 2 hours 40 minutes

**MODEL PAPER EXAMINATION 2025**  
**SUBJECT: ANATOMY & MICROTÉCHNIQUES**  
**SECTION "B" AND SECTION "C"**

 Total Marks 68  
 36 Marks

**Q2: SECTION "B" SHORT ANSWER QUESTIONS**

 Note: Answer any **NINE** questions from this section. All questions carry equal marks.

- (i) Give a comparison of types of muscle.
- (ii) Enlist hormones of anterior pituitary gland.
- (iii) How does the exchange of gases occur at the alveolar level?
- (iv) List down the main nine abdominal regions along with their organs
- (v) Differentiate between smooth & cardiac muscles.
- (vi) Write down the difference between meiosis & mitosis.
- (vii) Write down the steps of paraffin wax embedding.
- (viii) Differentiate between light and electron microscopy.
- (ix) Enlist the different types of stains used for bone tissues.
- (x) Why are secretions of the adrenal cortex called corticosteroids?
- (xi) Identify four major components of musculoskeletal system and briefly state the primary role each one plays in supporting the body or facilitating movement.
- (xii) Differentiate between the following:
  - a. Insulin & Glucagon
  - b. Central Nervous system & Peripheral Nervous system

**SECTION "C" DETAILED ANSWER QUESTIONS**
**32 Marks**

 Note: Answer any **TWO** questions from this section. All questions carry equal marks.

Q3:

- a. Describe the structure and function of a neuron.
- b. Explain how the diaphragm, intercostal muscles, and accessory muscles work together to change the size of the chest and move air in and out of the lungs during breathing.

Q4:

- a. Explain pituitary gland, its lobes and hormones in details.
- b. Briefly describe how the changing level of hormones coordinate the events in both the ovaries and the uterus?

Q5:

- a. Explain the skeletal system in detail with diagram.
- b. Describe how arteries, veins and capillaries work together to transport blood and exchange material throughout the body.

**END OF PAPER**