

NATIONAL UNIVERSITY OF IRELAND, GALWAY  
Ollscoil na hÉireann, Gaillimh

First Medical Summer 1998

**BIOLOGY  
ANATOMY**

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Two and a half hours

There are three sections.

Section A is for System Anatomy.

Section B for Histology and Embryology.

Section C is a True/False paper.

Please use separate answer books for Section A and Section B.

**SECTION A**

**SYSTEMS ANATOMY**

Answer THREE questions

1. Describe the quadriceps muscles and their innervation.
2. Give a general account of the brachial plexus.
3. Describe the distribution of the mandibular division of the trigeminal nerve.
4. Write a brief account of the joints and ligaments of the lumbar vertebral column.
5. Write about the muscles and joints involved in inversion (supination) of the foot.

**SECTION B**

**HISTOLOGY**

Answer TWO questions:

1. Write an essay on intercellular junctions.
2. Write an essay comparing the key features of cardiac, skeletal, and smooth muscle.
3. Write notes on:
 

(a)	Loose connective tissue.
(b)	The intervertebral disk.

**EMBRYOLOGY**

Answer ONE question

1. Describe the development of the upper limbs.
2. Write an essay on mesoderm.

## SECTION C

IN REPLY TO THE FOLLOWING QUESTIONS INDICATE WHETHER YOU THINK EACH STATEMENT IS TRUE OR FALSE AND PLACE YOUR REPLY IN THE COMPUTER FORMATTED ANSWER SHEET.

### 1. UPPER LIMB

- A Both heads of biceps attach to the scapula.
- B Brachialis inserts in the radius.
- C Brachioradialis extends the elbow joint.
- D Radius articulates with scaphoid.
- E The inferior radio-ulnar joint is synovial.

### 2. LOWER LIMB

- A Superior gluteal nerve supplies gluteus maximus.
- B Iliopsoas medially rotates the femur.
- C Popliteus medially rotates the femur.
- D Tibialis posterior tendon grooves the medial malleolus.
- E Talus articulates with cuboid.

### 3. MUSCLES OF MASTICATION

- A Medial pterygoid muscle inserts in temporo-mandibular joint capsule.
- B Nerve to medial pterygoid muscle is a branch of inferior alveolar nerve.
- C Medial pterygoid muscle arises from medial pterygoid plate.
- D Mandibular nerve supplies posterior belly of digastric.
- E Mandibular nerve passes through foramen ovale.

### 4. ABDOMINAL WALL

- A Quadratus lumborum muscle attaches to the 12th rib.
- B External oblique muscle attaches to the 12th rib.
- C Lateral cutaneous nerve of thigh pierces inguinal ligament.
- D Rectus abdominus muscle is supplied by intercostal nerves.
- E Psoas muscle is supplied by intercostal nerves.

### 5. HAND

- A Radial nerve is sensory to nail-beds.
- B The ulnar nerve supplies all the interossei.
- C The ulnar nerve supplies all the lumbricals.
- D The median nerve passes through the carpal tunnel.
- E Flexor digitorum superficialis tendons insert into the distal phalanges.

### 6. INVERSION/EVERSION

- A Inversion occurs principally at ankle joint.
- B Peroneus longus inserts on medial side of foot.
- C Peroneus longus is a plantar flexor.
- D Peroneus tertius is a dorsiflexor.
- E Calcaneus does not move in inversion.

### 7. CRANIAL NERVES

- A The facial nerve passes through the parotid gland.
- B The auriculo-temporal nerve passes through the parotid gland.
- C The inferior alveolar nerve terminates as the mental nerve.
- D The infra-orbital nerve is a branch of the ophthalmic nerve.
- E The facial nerve supplies masseter muscle.

### 8. NERVES

- A The axillary nerve supplies triceps.
- B The median nerve supplies flexor carpi radialis.
- C The ulnar nerve supplies flexor carpi ulnaris.
- D The ulnar nerve supplies extensor carpi ulnaris.
- E The musculo-cutaneous nerve supplies brachio-radialis muscle.

### 9. THE CELL

- A Membrane proteins in large part determine the characteristics of the membrane in which they are found.
- B Mitochondria contain DNA.
- C Protein destined for secretion is synthesized on smooth endoplasmic reticulum.
- D The trans Golgi network sorts vesicles to their appropriate destination.
- E Actin filaments are important structural elements of the cytoskeleton.

### 10. EPITHELIA

- A All epithelia are attached to a basal lamina.
- B Stratified epithelia are classified according to the shape of the cells of the basal layer.
- C Epithelial cells always have a defined polarity.
- D Microvilli are found on the basal surface of many epithelia.
- E Hemidesmosomes attach epithelial cells to one another.

11. **CONNECTIVE TISSUE**  
 A Mast cells are a constituent cell of loose connective tissue.  
 B Tendons are composed of dense irregular connective tissue.  
 C Fibrillin is a component of elastic fibres.  
 D Collagen is composed of subunits called tropocollagen.  
 E Ground substance contains glycosaminoglycans.
12. **CARTILAGE & BONE**  
 A Hyaline cartilage is composed mainly of type I collagen.  
 B Mature articular cartilage is repaired rapidly when damaged.  
 C The deposition of hyaline cartilage is an early step in fracture repair.  
 D The osteocyte is the functional unit of bone.  
 E Osteoclasts are derived from the fusion of several monocytes.
13. **MUSCLE & NERVE**  
 A Skeletal muscle fibres are joined to one another through intercalated discs.  
 B Unlike other muscle types, smooth muscle cells do not contain actin or myosin.  
 C Schwann cells are the source of myelin in myelinated peripheral nerves.  
 D Microtubules are an important cellular constituent of nerve cells.  
 E Transport of ions across the cell membrane is the basis of nerve conduction.
14. **IMPLANTATION**  
 A Occurs in post-fertilization week three.  
 B Syncytiotrophoblast is cellular.  
 C Tertiary villi contain capillaries.  
 D Villi are bathed in maternal blood.  
 E Primary villi contain mesoderm.
15. **FERTILIZATION/CLEAVAGE**  
 A Zygote surrounded by zona pellucida.  
 B Morula surrounded by zona pellucida.  
 C Oocyte completes meiosis after fertilization.  
 D Acrosome contains hyaluronidase.  
 E Fertilization normally occurs in uterus.