

MANIPAL ACADEMY OF HIGHER EDUCATION

(Deemed University)

M.Sc. (PRELIMINARY) DEGREE EXAMINATION – JULY 2005

PAPER I: ANATOMY

Monday, July 04, 2005

Time available: 3 Hours

Maximum Marks: 100

✍ **Answer ALL the questions.**

✍ **Illustrate your answers with neatly drawn and correctly labelled diagrams wherever appropriate.**

1. Describe the boundaries and contents of inguinal canal. Discuss the applied importance. (15 marks)

2. Describe the parts, relations, blood supply and development of thyroid gland. (15 marks)

3. Write short notes on:

3A. Spermiogenesis.

3B. Microscopic structure of hyaline cartilage.

3C. Stomach.

3D. Tentorium cerebelli.

(5×4 = 20 marks)

4. Describe the origin, course, tributaries and termination of azygos vein. (15 marks)

5. Describe the parts, relations, blood supply and lymphatic drainage of stomach. (15 marks)

6. Write short notes on:

6A. Orbicularis oculi muscle.

6B. Facial artery.

6C. Vocal folds.

6D. Ligamentum arteriosum.

(5×4 = 20 marks)



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M. Sc. (PRELIMINARY) DEGREE EXAMINATION – JULY 2005

PAPER II: PHYSIOLOGY

Tuesday, July 05, 2005

Time available: 3 Hours

Maximum Marks: 100

✍ **Answer all the questions.**

✍ **Illustrate your answers with neatly drawn and correctly labelled diagrams wherever appropriate.**

1. Draw labeled diagrams to show the course of any ONE ascending tract and any ONE descending tract of spinal cord. Mention the functions of these tracts.

(4+4+2 = 10 marks)

2. Explain the origin and conduction of cardiac impulse in human heart. Mention how cardiac innervation regulates heart rate.

(3+5+2 = 10 marks)

3. Write briefly on:

3A. Mechanism of synaptic transmission.

3B. Actions of thyroxine.

3C. Cause and features of diabetes mellitus.

3D. Influence of hormones on lactation.

(5×4 = 20 marks)

4A. Explain the process of spermatogenesis.

4B. What is contraception? Explain the different methods of contraception that can be employed in females.

4C. Draw diagrams to illustrate the cause and correction of common errors of refraction.

4D. Draw diagrams of sarcomere at rest and during skeletal muscle contraction.

(5×4 = 20 marks)

5. Write briefly on:

5A. Starling's law of heart and its application.

5B. Functions of proximal convoluted tubules of kidney.

5C. Thermoregulation in hot weather.

5D. Regulation of erythropoiesis.

(5×4 = 20 marks)

6A. Outline the mechanism of salivary secretion when food is placed in oral cavity.

6B. Name the different types movements seen in gastrointestinal tract. Explain their importance in gastrointestinal function.

6C. Outline the mechanism of quiet inspiration and expiration. What is the role of respiratory centers in this process?

6D. Write briefly on the causes of different types of hypoxia. Add a note on cyanosis.

(5×4 =20 marks)



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M. Sc. (PRELIMINARY) DEGREE EXAMINATION – JULY 2005

PAPER III: BIOCHEMISTRY

Wednesday, July 06, 2005

Time: 3 Hrs.

Max. Marks: 100

 **Answer all questions.**

 **Illustrate your answers with neatly drawn labelled diagrams wherever appropriate.**

1. Explain the different types of enzyme inhibitors. What are the applications of competitive inhibitors in medicine?
(15 marks)
2. Write short notes on:
a) Galactosemia b) Absorption of glucose c) Hazards of radio isotopes.
(3×3 = 9 marks)
3. With the help of structures explain the following:
a) Sucrose is a non-reducing sugar
b) Cellulose is digested by ruminants but not by humans.
(2×2 = 4 marks)
4. Write a short note on outlining the relationship between collagen structure and its function.
(5 marks)
5. Write the structure of:
a) Lecithin b) Phenyl alanine c) AMP d) Sphingomyelin.
(4 marks)
6. Discuss the metabolism of iron under the following headings:
a) Sources and RDA b) Absorption
c) Storage and transport d) Functions and deficiency.
(2+5+4+4 = 15 marks)
7. Enumerate the sources of carbon and nitrogen atoms in the purine ring. Add a note on its regulation of purine biosynthesis.
(6 marks)
8. Explain why the breath of an untreated diabetic smells of acetone.
(3 marks)
9. Calculate the pH of a buffer containing 0.01 M acetic acid and 0.1 M sodium acetate. P^K value of acetic acid is 4.76.
(4 marks)
10. Write short note on:
a) Lac Operon b) Structure of cell membrane
c) Mutation d) Jaundice e) Chemiosmotic theory
f) Immunoglobulin g) ELISA.
(5×7 = 35 marks)



MANIPAL ACADEMY OF HIGHER EDUCATION

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M.Sc. (PRELIMINARY) DEGREE EXAMINATION – DECEMBER 2005

PAPER I: ANATOMY

Monday, December 05, 2005

Time available: 3 Hours

Maximum Marks: 100

✍ Answer ALL the questions.

✍ Illustrate your answers with neatly drawn and correctly labelled diagrams wherever appropriate.

1. Describe the position, relations, blood supply, development and microscopic structure of palatine tonsil.

(15 marks)

2. Describe the parts, relations, blood supply and development of pancreas.

(15 marks)

3. Write short notes on:

(5×4 = 20 marks)

3A. Chorion.

3B. Microscopic structure of lymph node.

3C. Superior intercostal vein.

3D. Carotid sheath.

4. Describe the arterial supply and nerve supply to the heart.

(15 marks)

5. Describe the relations, blood supply, development and microscopic structure of left ureter in female.

(15 marks)

6. Write short notes on:

(5×4 = 20 marks)

6A. Temporalis muscle.

6B. Tympanic membrane.

6C. Parotid duct.

6D. Lymphatic drainage of stomach.



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M. Sc. (PRELIMINARY) DEGREE EXAMINATION – DECEMBER 2005

PAPER II: PHYSIOLOGY

Tuesday, December 06, 2005

Time available: 3 Hours

Maximum Marks: 100

✍ Answer all the questions.

✍ Illustrate your answers with neatly drawn and correctly labelled diagrams wherever appropriate.

1. Discuss in detail the transport of CO₂ from the tissue cells to the alveoli.
(10 marks)

- 2A. What is the effect of an increase in venous return on cardiac output? Explain the mechanism involved.
(1+4 = 5 marks)

- 2B. In a tabular statement enumerate the differences between the first and the second heart sounds. How are these heart sounds recorded?
(4+1 = 5 marks)

- 2C. Draw a normal electrocardiogram recorded from limb lead II. Explain how different waves are produced. Label the P-R interval.
(2+2+1 = 5 marks)

- 2D. What is the normal GFR? How is it measured? Enumerate the factors influencing GFR.
(1+1+3 = 5 marks)

- 3A. Explain the pharyngeal phase of deglutition. Name the other two phases of deglutition.
(4+1 = 5 marks)

- 3B. Explain briefly the hormonal regulation of pancreatic juice secretion.
(5 marks)

- 3C. Explain briefly the functions of T and B lymphocytes.
(3+2 = 5 marks)

- 3D. Explain briefly the factors influencing erythropoiesis.
(5 marks)

4. Discuss in detail the actions of insulin. Add a note on regulation of insulin secretion. Explain the polyuria of diabetes mellitus.
(6+2+2 = 10 marks)

5A. Name the different steps involved in spermatogenesis. Add a note on factors influencing spermatogenesis.

(2 ½+ 2 ½ = 5 marks)

5B. Name the pituitary gonadotrophic hormones. What are their actions in

- i) Females ii) males

(1+2+2 = 5 marks)

5C. Explain the actions of thyroxine on:

- i) cardiovascular system. ii) nervous system in infants

(5 marks)

5D. Draw a diagram of the neuromuscular junction. List the events that occur at this junction to transmit impulses.

(3+2 = 5 marks)

6A. Draw a diagram to show the origin, course and termination of corticospinal tract. Enumerate four features when this tract is lesioned.

(3+2 = 5 marks)

6B. Define a reflex action. Draw a diagram to show the components of the reflex arc. Specify the role of each component of reflex arc.

(1+2+2 = 5 marks)

6C. Name four ascending tracts of spinal cord. Give the role of one of these tracts.

(2+3 = 5 marks)

6D. Enumerate four functions of middle ear and explain any one of these functions.

(2+3 = 5 marks)



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M. Sc. (PRELIMINARY) DEGREE EXAMINATION – DECEMBER 2005

PAPER III: BIOCHEMISTRY

Wednesday, December 07, 2005

Time: 3 Hrs.

Max. Marks: 100

✍ **Answer all questions.**

✍ **Illustrate your answers with neatly drawn labelled diagrams wherever appropriate.**

1. Discuss the various factors affecting the activity of the enzymes. Give examples wherever required. Write the Michaelis-Menton equation and give the significance of K_m . (15 marks)
2. Compare and contrast liver and muscle glycogen metabolism. (5 marks)
3. Explain the amphibolic role of tricarboxylic acid cycle. (5 marks)
4. Explain the importance of polyunsaturated fatty acids in our body. (5 marks)
5. Explain the metabolic changes during starvation. (5 marks)
6. Write short notes on (5×3 = 15 marks)
 - 6A. Disorder of phenylalanine metabolism.
 - 6B. Classification of compound lipids.
 - 6C. Lactose intolerance.
7. Explain the principle and application of recombinant DNA technology. (15 marks)
8. Explain the different types of gene mutations. (5 marks)
9. Describe the iron metabolism under the following heading:
 - 9A. Absorption
 - 9B. Functions
 - 9C. Deficiency manifestation. (5 marks)
10. Explain with example the conjugation mechanism in detoxification. (5 marks)
11. Differentiate between metabolic and respiratory acidosis. Give examples. (5 marks)
12. Write short notes on: (5×3 = 15 marks)
 - 12A. Selenium sparing action of vitamin E.
 - 12B. Henderson-Hasselbalch equation.
 - 12C. Cell cycle.

