MANIPAL UNIVERSITY

M. Sc. (PRELIMINARY) DEGREE EXAMINATION – JULY 2008

PAPER I: ANATOMY

Tuesday, July 01, 2008

Time available: 3 Hours | Maximum Marks: 80

Answer ALL the questions. Draw diagrams wherever necessary.

1. Describe the typical **intercostal space** under the following:

1A. Contents

1B. Typical intercostal nerve

(6+4 = 10 marks)

2. Describe the **stomach** under:

2A. Parts

2B. Relations

2C. Blood supply

2D. Lymphatic drainage

(2+2+3+3 = 10 marks)

3. Describe the **urinary bladder** under:

3A. Surfaces and borders

3B. Relations

3C. Blood supply

(3+5+2 = 10 marks)

4. Describe the **parotid gland** under:

4A. Surfaces and borders

4B. Relations

(4+6 = 10 marks)

5. Write short notes on:

5A. Microscopic structure of cardiac muscle

5B. Porto-caval anastomosis

5C. Chorion

5D. Major openings of the diaphragm.

5E. Synovial joint

5F. Barr body

5G. Venous drainage of the face

5H. First rib

5I. Uterine tube

5J. Digastric muscle

(4×10 = 40 marks)

MANIPAL UNIVERSITY

M. Sc. (PRELIMINARY) DEGREE EXAMINATION – JULY 2008

PAPER II: PHYSIOLOGY

Wednesday, July 02, 2008

Time available: 3 Hours | Maximum Marks: 80

- **Answer ALL the questions.**
- **Illustrate your answers with neatly drawn diagrams wherever appropriate.**

1. Give the normal plasma blood glucose level. Briefly describe the hormonal regulation of the same.

(8 marks)

2A. Name the types of smooth muscle and describe their innervation. Name the Ca++ binding protein in smooth muscle.

(3+1 = 4 marks)

2B. Classify the body fluid compartments. Mention the major aspects in which they differ.

(2+2 = 4 marks)

3A. What is withdrawal reflex? Draw a diagram of the reflex arc.

(4 marks)

3B. Name the different receptors and the pathways for touch sensation. Explain the importance of stereognosis.

(3+1 = 4 marks)

3C. Describe the features of hemisection of the spinal cord occurring at the level of T_{10} on the right side.

(4 marks)

3D. Explain the importance of basilar membrane in the analysis of frequencies of sound waves.

(4 marks)

4A. Name the different types of hormonal receptors and explain the mechanism of action of intracellular receptors.

(2+2 = 4 marks)

4B. List the functions of the testosterone.

(4 marks)

4C. Explain the physiological basis of the action of oral contraceptives. List other contraceptive methods available for female.

(2+2 = 4 marks)

4D. List the different types of cells lining the gastric mucosa and explain how ulceration is prevented.

(2+2 = 4 marks)

5A Explain the principle regarding the determination of the blood group of a person and give the significance of Rh typing.

(2+2 = 4 marks)

5B. Classify anemia. Mention which nutritional deficiencies cause anemia.

(2+2 = 4 marks)

5C. Draw a diagram of the ventricular muscle action potential and explain the ionic basis.

(4 marks)

5D. Name two methods used to determine the cardiac output. Explain the mechanism by which cardiac output increases during exercise.

(1+3 = 4 marks)

6A. Describe the role of CNS ischemic response in blood pressure regulation.

(4 marks)

6B. Giving a suitable examples explain how blood flow to an organ is normally regulated.

(4 marks)

6C. Describe how the structure of the cells lining the proximal tubule help in its function. Name the substances that are transported at that level.

(2+2 = 4 marks)

6D. Name the forms in which CO_2 is transported in blood. Describe how hypercapnia affects respiration.

(4 marks)

MANIPAL UNIVERSITY

M. Sc. (PRELIMINARY) DEGREE EXAMINATION – JULY 2008

PAPER III: BIOCHEMISTRY

Thursday, July 03, 2008

Time: 3 Hrs. Max. Marks: 80

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

1. Describe the process of beta oxidation of fatty acids. Add a note on its energetics and Refsum's disease.

(12 marks)

2. What are isoenzymes? What is the method of their separation? Explain their clinical significance.

(4 marks)

3. Describe the Krebs Hanseleit cycle of ammonia detoxification

(4 marks)

4. Classify phospholipids. Give examples and their specific functions.

(4 marks)

5. Define gluconeogenesis and explain the significance of the pathway. Write the key reactions of the pathway.

(4 marks)

6. Write short notes on:

6A. Cori's cycle

6B. Regulation of cholesterol level

6C. Determination of N-terminal amino acid.

(4×3 = 12 marks)

7. Explain the catabolic process of purine nucleotides. Discuss the metabolic defects in hyper uricemia and its treatment.

(12 marks)

8. Describe the different types of RNA.

(4 marks)

9. Give four examples with explanation for post translational modification. Name two inhibitors of protein synthesis.

(4 marks)

10. Explain briefly the steps in molecular cloning.

(4 marks)

11. Write the source, RDA and functions of Vitamine E.

(4 marks)

12. Write short notes on:

12A. DNA probing

12B. Polymerase chain reaction

12C. Nutritional deficiency anaemia.

(4×3 = 12 marks)

Reg. No.										

MANIPAL UNIVERSITY

M. Sc. (PRELIMINARY)/FIRST YEAR M.Sc. MOLECULAR BIOLOGY & HUMAN GENETICS

DEGREE EXAMINATION – DECEMBER 2008

PAPER I: ANATOMY

Monday, December 01, 2008

Time available: 14:00 – 17:00 Hrs | Maximum Marks: 80

✍ **Answer ALL the questions. Draw diagrams wherever necessary.**

1. Describe the heart under the following headings:
1A. External features
1B. Interior of right atrium
1C. Arterial supply

(2+4+4 = 10 marks)

2. Describe the liver under the following:
2A. Surfaces
2B. Relations

(3+7 = 10 marks)

3. Describe the anal canal under the following:
3A. Extent
3B. Interior
3C. Blood supply
3D. Applied aspects

(2+4+2+2 = 10 marks)

4. Describe the infratemporal fossa under:
4A. Boundaries
4B. Mention contents
4C. Add a note on lateral pterygoid muscle.

(3+3+4 = 10 marks)

5. Write short notes on:
5A. Microscopic structure of elastic cartilage
5B. Vas deferens
5C. Placenta
5D. First intercostal space
5E. Turner's syndrome
5F. External carotid artery
5G. Typical rib
5H. Epiploic foramen
5I. Sternocleidomastoid
5J. Fibrous joints

(4×10 = 40 marks)

Reg. No.										

MANIPAL UNIVERSITY

M. Sc. (PRELIMINARY)/FIRST YEAR M.Sc. MOLECULAR BIOLOGY & HUMAN GENETICS
DEGREE EXAMINATION – DECEMBER 2008
PAPER II: PHYSIOLOGY
Tuesday, December 02, 2008

Time: 14:00 – 17:00 Hrs | Maximum Marks: 80

- **Answer ALL the questions.**
- **Illustrate your answers with neatly drawn diagrams wherever appropriate.**

1. Draw a diagram to show the sympathetic nerve supply to the heart. Enumerate the effects of stimulation of these nerve fibers on the heart. Explain how the following affect heart rate
   i) Increase in blood pressure ii) Muscular exercise

(8 marks)

2A. Define 'tidal volume', 'residual volume' and 'vital capacity' and give their normal values. Explain the importance of vital capacity.
2B. Name the peripheral chemoreceptors. Name the factors that stimulate these receptors. Enumerate the effects of chemoreceptor stimulation on
   i) Respiration ii) Blood pressure iii) Heart rate
2C. What happens to venous return as soon as a person stands up from the lying position? Explain the compensatory changes/consequences.
2D. With the help of a diagram, explain the mechanism of glucose reabsorption from the renal tubules.

(4×4 = 16 marks)

3A. Explain the regulation of salivary secretion.
3B. Name the bile salts. Name the site of synthesis of bile. List three functions of the bile salts.
3C. Explain briefly the functions of plasma albumin.
3D. Define 'Haemostasis' and explain briefly the mechanisms involved.

(4×4 = 16 marks)

4. What is the normal plasma calcium level? Explain briefly four functions of ionic calcium. Add a note on how PTH regulates the ionic calcium level.

(8 marks)

5A. Explain the actions of growth hormone on growth. Name four other hormones produced by the anterior pituitary gland.
5B. Draw a diagram to show the regulation of secretion of thyroxine. List four features of hyperthyroidism.
5C. Enumerate the actions of estrogen on i) Uterine endometrium ii) Mammary gland
5D. Draw a labelled diagram of a monophasic action potential from a nerve fiber and label the parts. Explain the ionic basis for depolarization and repolarization.

(4×4 = 16 marks)

6A. Draw a labelled diagram to show the pathway for pain impulses from the receptors to their termination. Explain the terms analgesia and 'anesthesia'.
6B. Give two locations of lower motor neurons. Enumerate four effects of lower motor neuron lesions.
6C. Enumerate four functions of the hypothalamus and explain any one of them.
6D. Explain 'direct and indirect light reflexes'. Draw a diagram to show the direct light reflex pathway.

(4×4 = 16 marks)

Reg. No.										

MANIPAL UNIVERSITY

M. Sc. (PRELIMINARY)/FIRST YEAR M.Sc. MOLECULAR BIOLOGY & HUMAN GENETICS DEGREE EXAMINATION – DECEMBER 2008

PAPER III: BIOCHEMISTRY

Wednesday, December 03, 2008

Time: 14:00 – 17:00 Hrs. Max. Marks: 80

- **Answer ALL questions.**
- **Illustrate your answers with neatly drawn and correctly labelled diagrams wherever appropriate.**

1. Explain how heme is synthesized in the body. How is it regulated? Add a note on the catabolism of heme.

(12 marks)

2. Answer the following:

2A. Protein energy malnutrition.
2B. Substrate level phosphorylation.
2C. Glycolipids.
2D. Recombined DNA technology.
2E. Enzyme inhibition.
2F. Bile acids and their role.
2G. Inborn errors associated with phenylalanine metabolism.

(4×7 = 28 marks)

3. Describe glycolysis indicating the steps where energy is liberated showing the no. of ATPs formed.

(12 marks)

4. Answer the following:

4A. Transamination.
4B. tRNA.
4C. Sources for gluconeogenesis with the reactions catalysed by gluconeogeric KEY enzymes.
4D. Transmethylations.
4E. Role of vitamin D on calcium metabolism.
4F. Prostaglandins.
4G. Mutagenic factors.

(4×7 = 28 marks)