

# Faculty of Science

## End Semester Examination May 2025

### FS3EL11 Human Physiology

<b>Programme</b>	:	B. Sc. (Hons.)	<b>Branch/Specialisation</b>	:	FS
<b>Duration</b>	:	3 hours	<b>Maximum Marks</b>	:	60

**Note:** All questions are compulsory. Internal choices, if any, are indicated. Assume suitable data if necessary.

Notations and symbols have their usual meaning.

<b>Section 1 (Answer all question(s))</b>				<b>Marks CO BL</b>
<b>Q1.</b> The process by which Glucose is broken down into Pyruvate is known as-	<input type="radio"/> Gluconeogenesis	<input type="radio"/> Glycogenolysis	<input checked="" type="radio"/> Glycolysis	1    1    2
<b>Q2.</b> Which vitamin is water-soluble and essential for the synthesis of collagen?	<input type="radio"/> Vitamin A	<input type="radio"/> Vitamin B12	<input checked="" type="radio"/> Vitamin C	1    2    2
<b>Q3.</b> Which of the following processes involves the conversion of lactate back into glucose in the liver?	<input type="radio"/> Glycolysis	<input checked="" type="radio"/> Cori cycle	<input type="radio"/> Pentose phosphate pathway	1    2    4
<b>Q4.</b> Which of the following is a key intermediate in both glycolysis and gluconeogenesis?	<input type="radio"/> Glucose-6-phosphate	<input type="radio"/> Acetyl-CoA	<input checked="" type="radio"/> Glyceraldehyde-3-phosphate (G3P)	1    2    2
<b>Q5.</b> Which hormone stimulates the secretion of gastric acid (HCl) from parietal cells?	<input type="radio"/> Cholecystokinin (CCK)	<input checked="" type="radio"/> Gastrin	<input type="radio"/> Secretin	1    3    2
<b>Q6.</b> Which of the following is responsible for activating trypsinogen to trypsin in the small intestine?	<input type="radio"/> Cholecystokinin (CCK)	<input checked="" type="radio"/> Enterokinase	<input type="radio"/> Pepsin	1    3    2
<b>Q7.</b> In a state of ventilation-perfusion mismatch, which of the following conditions is most likely to occur?	<input type="radio"/> Normal oxygen levels in the blood	<input checked="" type="radio"/> Decreased oxygenation of the blood	<input type="radio"/> Increased carbon dioxide in the alveoli	1    4    4
<b>Q8.</b> Compared to haemoglobin, myoglobin has a-	<input checked="" type="radio"/> Higher affinity for oxygen and does not exhibit a sigmoid dissociation curve	<input type="radio"/> Lower affinity for oxygen and exhibits a sigmoid dissociation curve	<input type="radio"/> Similar affinity for oxygen and exhibits a linear dissociation curve	1    4    2
<b>Q9.</b> Where are neurotransmitters stored before release into the synaptic cleft?	<input type="radio"/> Mitochondria	<input checked="" type="radio"/> Synaptic vesicles	<input type="radio"/> Golgi apparatus	1    4    4
		<input type="radio"/> Endoplasmic reticulum		

**Q10.** Acetylcholine acts as a neurotransmitter at which of the following sites?

1 5 2

- Skeletal muscle neuromuscular junction
- Sympathetic postganglionic fibers
- Blood-brain barrier
- All of the above

### Section 2 (Answer all question(s))

**Q11.** Give the classification of carbohydrates with example.

Marks CO BL  
2 1 2

Rubric	Marks
Classification of carbohydrates	1
Examples of carbohydrates as mono, di, poly saccharides	1

**Q12.** Explain the types of vitamins and their importance on human health.

3 1 2

Rubric	Marks
Types of vitamins Fat Solvable, Water solvable	1.5
Their importance on human health.	1.5

**Q13. (a)** Describe the concept of enzyme kinetics, types of enzyme inhibition, and the roles of coenzymes and cofactors in enzyme activity.

5 2 2

Rubric	Marks
concept of enzyme kinetics, types of enzyme inhibition	2.5
The roles of coenzymes and cofactors in enzyme activity	2.5

(OR)

**(b)** Describe the classification and function of protein & Ammino acids with its structures.

Marks CO BL  
2 2 2

Rubric	Marks
classification and function of protein & Ammino acids 1° 2° 3°	2.5
structures of protein & Ammino	2.5

### Section 3 (Answer all question(s))

**Q14.** What is the role of the mitochondrial electron transport chain in cellular respiration?

Rubric	Marks
Role of the mitochondrial electron transport chain in cellular respiration	2

**Q15. (a)** Explain the process of glycolysis, and the importance of the Cori cycle in maintaining glucose homeostasis.

8 2 4

Rubric	Marks
Process of glycolysis	4
Importance of the Cori cycle in maintaining glucose homeostasis .	4

(OR)

**(b)** Explain the processes of TCA cycle, & PPP pathway its regulation, and the importance of these processes in maintaining blood glucose.

Rubric	Marks
Explain the processes of TCA cycle	3
PPP pathway	3
Its regulation, and the importance of these processes in maintaining blood glucose	2

#### Section 4 (Answer all question(s))

**Q16.** Give the histology of alimentary canal. Write its importance in digestive process.

Marks CO BL

3 3 2

Rubric	Marks
Histology of alimentary canal	1.5
its importance in digestive process	1.5

**Q17. (a)** Describe the physiological importance of digestive glands as: Liver, Pancreas, stomach. Explain the secretion, function and regulation of each gland.

7 3 2

Rubric	Marks
Histological structures of the digestive glands	3
Secretion, functions, and regulation of each gland	4

(OR)

**(b)** Describe the process of secretion, regulation of gastric juice and intestinal juice. Explain its importance in digestion.

Rubric	Marks
Process of secretion, regulation of gastric juice and intestinal juice	4
its importance in digestion	3

#### Section 5 (Answer all question(s))

**Q18.** Describe the mechanics of breathing, including the processes of inhalation and exhalation.

Marks CO BL

4 4 2

Rubric	Marks
Mechanics of breathing	2
Processes of inhalation and exhalation	2

**Q19. (a)** Describe the transport mechanisms of oxygen ( $O_2$ ) and carbon dioxide ( $CO_2$ ) in the body. Explain how oxygen is transported in the blood and how carbon dioxide is carried back to the lungs for exhalation.

6 4 2

Rubric	Marks
Transport mechanisms of oxygen ( $O_2$ ) and carbon dioxide ( $CO_2$ ) in the body	3
Explanation on oxygen transported in the blood and how carbon dioxide is carried back to the lungs for exhalation.	3

(OR)

**(b)** What are tidal volumes or lung capacity? Explain its types with example.

Rubric	Marks
tidal volumes or lung capacity	3
its types with example	3

### Section 6 (Answer any 2 question(s))

Marks CO BL

**Q20.** Explain the structure and function of ion channels in neurons. Discuss the concept of resting membrane potential and the role of ion channels in maintaining it. 5 5 2

Rubric	Marks
Structure and function of ion channels in neurons	2.5
Concept of resting membrane potential and the role of ion channels in maintaining it	2.5

**Q21.** Explain the molecular mechanisms involved in synaptic transmission, with a focus on acetylcholine (ACh) as a neurotransmitter. 5 5 1

Rubric	Marks
Definition synaptic transmission	2.5
Molecular mechanisms involved in synaptic transmission	2.5

**Q22.** Describe the process of neuron-neuron interaction, focusing on the synthesis, storage and release of neurotransmitters. 5 5 1

Rubric	Marks
Process of neuron-neuron interaction.	2.5
Synthesis, storage and release of neurotransmitters.	2.5

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