

**Paper Code : 12002**  
**University Examination – February 2023**  
**BDS First Year**  
**Paper Second**

**General Human Physiology and Biochemistry**

TIME: 3 hours

Maximum marks: 70

**Note: Attempt all questions. Draw neat labelled diagrams wherever necessary. Write answer in separate answer book for Part A and Part B. Parts of a question must be answered together.**

**Part A**

**(35 Marks)**

**(Human Physiology)**

Q.1. What is cardiac output? Discuss the various factors which affect it and how it is measured?

**(15 Marks)**

Q.2. Write short notes on the following :

**(5 Marks Each)**

- (a) Spermatogenesis
- (b) Juxtaglomerular apparatus
- (c) Graves disease

Q.3. Multiple Choice Question:

**(1 Mark Each)**

(i) **which ion is most abundant intracellularly -**

- |                   |                      |
|-------------------|----------------------|
| (A) $\text{Na}^+$ | (B) $\text{K}^+$     |
| (C) $\text{Cl}^-$ | (D) $\text{Mg}^{+2}$ |

(ii) **Hale life of platelets is -**

- |                |               |
|----------------|---------------|
| (A) 8-12 hours | (B) 8-12 days |
| (C) 30 days    | (D) 8-12 mins |

(iii) **Synaptic vesicle release at NMJ is due to -**

- |                             |                            |
|-----------------------------|----------------------------|
| (A) $\text{Na}^+$ influx    | (B) $\text{Ca}^{+2}$ Eflux |
| (C) $\text{Ca}^{+2}$ Influx | (D) $\text{Cl}^-$ Eflux    |

(iv) **Normal pH of saliva varies -**

- |              |            |
|--------------|------------|
| (A) 4 to 6.4 | (B) 5 to 6 |
| (C) 6.4 to 7 | (D) 7 to 8 |

(v) **Phagocytosis is function of all the following except -**

- |                   |                 |
|-------------------|-----------------|
| (A) T-lymphocytes | (B) Eosinophils |
| (C) Monocytes     | (D) Neutrophils |

**Conti..2..**

**Part B**  
**(Biochemistry)**

**(35 Marks)**

Q.1. Define oxidative phosphorylation. Describe Electron Transport Chain (ETC). Enumerate the various inhibitors of ETC.

**(15 Marks)**

Q.2. Write short Notes on the following:

**(5 Marks Each)**

- (a) Tumour Markers
- (b) Deficiency features of Vitamin-D
- (c) Plasma Proteins

Q.3. Multiple Choice Questions.

**(1 Mark Each)**

(i) **The following enzymes are raised in Myocardial infarction EXCEPT -**

- (A) LDH
- (B) AST
- (C) Lipase
- (D) CK-MB

(ii) **All the following help in increasing blood glucose EXCEPT -**

- (A) Insulin
- (B) Glucagon
- (C) Epinephrine
- (D) Thyroxine

(iii) **The first Immunoglobulin to appear after exposure to an antigen (Primary Response) is -**

- (A) IgA
- (B) IgG
- (C) IgM
- (D) IgD

(iv) **All the following are ketone bodies EXCEPT-**

- (A) Aceto-acetate
- (B) Lactate
- (C)  $\beta$ -hydroxy Butyrate
- (D) Acetone

(v) **The following base is a purine -**

- (A) Cytosine
- (B) Uracil
- (C) Thymine
- (D) Adenine

**Paper Code : 12002**  
**University Supplementary Examination – December 2021**  
**BDS First Year**  
**Physiology and Biochemistry**  
**Paper Second**

TIME: 3 hours

Maximum marks: 70

**Note: Attempt all questions. Draw neat labelled diagrams wherever necessary. Write answer in separate answer book for Part A and Part B.**

**Part A**  
**(Physiology)**

(35 Marks)

Q.1. Define blood pressure and its various components. Describe the regulation of blood pressure in detail.

(15 Marks)

Q.2. Write short notes on the following :

(5 Marks Each)

- (a) Mechanism of swallowing
- (b) Anemia and its types
- (c) Vital capacity

Q.3. Multiple Choice Questions.

(1 Mark Each)

- (i) **Glomerular filtration in an average adult is -**
  - (a) 40-50 litres
  - (b) 90-100 litres
  - (c) 140-150 litres
  - (d) 170-180 litres
- (ii) **Myxoedema is caused by -**
  - (a) Deficiency of thyroid hormone in adult
  - (b) Excess of thyroid hormone in children
  - (c) Excess of growth hormone
  - (d) Deficiency of growth hormone
- (iii) **Acts is most effective in stimulating the secretion of -**
  - (a) Cortisol
  - (b) Thyroxine
  - (c) Adrenal Androgens
  - (d) Aldosterone
- (iv) **The maximum parasympathetic fibres are present in -**
  - (a) III nerve
  - (b) VII nerve
  - (c) IX nerve
  - (d) X nerve
- (v) **Average normal duration of menstrual cycle is -**
  - (a) Three weeks
  - (b) Four weeks
  - (c) Five weeks
  - (d) Six weeks

**Conti..2..**

(35 Marks)

**Part B**  
**(Biochemistry)**

Q.1. Describe the pathway of glycogenesis and glycolysis. What are their rate regulating enzymes? (15 Marks)

Q.2. Write short notes on the following : (5 Marks Each)

- (a) Classification of enzymes
- (b) Dietary fibres
- (c) Sources, function and mechanism of action of vitamin K

Q.3. Multiple Choice Questions. (1 Mark Each)

- (i) **Which nucleoside is found in DNA?**
  - (a) Pseudouridine
  - (b) Dihydrouridine
  - (c) Deoxythymidine
  - (d) Inosine
- (ii) **Iron is deficient in -**
  - (a) Cereals ( Rice, Wheat)
  - (b) Maize and corn
  - (c) Pulses (Bengalgram etc)
  - (d) Milk
- (iii) **The intercellular cation present in maximum concentration is -**
  - (a) Potassium
  - (b) Magnesium
  - (c) Sodium
  - (d) Calcium
- (iv) **The anti coagulant found in the body is -**
  - (a) Potassium oxalate
  - (b) Sodium citrate
  - (c) Heparin
  - (d) Edta
- (v) **Rate limiting enzyme of heme synthesis is -**
  - (a) Heme synthase
  - (b) ALA dehydrase
  - (c) ALA synthase
  - (d) Uroporphyrinogin synthase

**Paper Code : 12002**  
**University Examination – September 2021**  
**BDS First Year**  
**Physiology and Biochemistry**  
**Paper Second**

TIME: 3 hours

Maximum marks: 70

**Note: Attempt all questions. Draw neat labelled diagrams wherever necessary. Write answer in separate answer book for Part A and Part B.**

**Part A**  
**(Physiology)**

(35 Marks)

Q.1. Name salivary glands. Give composition and functions of saliva. Add a note on mechanism and control of salivary secretion.

(15 Marks)

Q.2. Write short notes on the following :

(5 Marks Each)

- (a) Tissue macrophage system
- (b) Properties of cardiac muscle
- (c) Role of chemoreceptors in respiration

Q.3. Multiple Choice Questions.

(1 Mark Each)

(i) **What percentage of glomerular filtrate is normally reabsorbed?**

- (a) 1%
- (b) 10%
- (c) 80%
- (d) 99%

(ii) **Milk ejection reflex is mediated by**

- (a) Oxytocin
- (b) Vasopressin
- (c) Prolactin
- (d) Oestrogen

(iii) **Which is not required in calcium metabolism?**

- (a) Vitamin D
- (b) Parathyroid hormone
- (c) Calcitonin
- (d) Thyroxine

(iv) **Pain sensations are transmitted by which tract?**

- (a) Dorsal column
- (b) Lateral spinothalamic
- (c) Anterior spinothalamic
- (d) Spinocerebellar

(v) **Parkinson's disease is a disorder of -**

- (a) Thalamus
- (b) Hypothalamus
- (c) Basal ganglia
- (d) Cerebellum

**Part B**  
**(Biochemistry)**

(35 Marks)

Q.1. Define gluconeogenesis. Describe the pathway of synthesis of glucose from lactate. What are the key regulatory enzymes of the pathway?

(15 Marks)

Q.2. Write short Notes on the following:

(5 Marks Each)

- (a) Protein calorie malnutrition
- (b) Synthesis and function of vitamin D
- (c) Isoenzymes and their clinical importance

Q.3. Multiple Choice Questions.

(1 Mark Each)

- (i) **Which one of the following is a dietary essential?**
- (a) Oleic acid
  - (b) Palmitic acid
  - (c) Stearic acid
  - (d) Linolenic acid
- (ii) **The protein present in highest concentration in plasma is -**
- (a) Fibrinogen
  - (b) Gamma globulins
  - (c) Albumin
  - (d) Alpha globulins
- (iii) **When pH falls by 1 unit, the hydrogen ion concentration?**
- (a) Decreases 10 times
  - (b) Increases two fold
  - (c) Changes by seven times
  - (d) Increases 10 times
- (iv) **Normal level of calcium in blood is -**
- (a) 3-4 mg/dl
  - (b) 9-11 mg/dl
  - (c) 4-5 mEq/L
  - (d) 96-106 mEq/L
- (v) **Which enzyme protects DNA from aging?**
- (a) DNA Polymerase
  - (b) Topoisomerase
  - (c) Deoxyribonuclease
  - (d) Telomerase

**Paper Code : 12002**  
**University Supplementary Examination – February 2021**  
**BDS First Year**  
**General Human Physiology and Biochemistry**  
**Paper Second**

TIME: 3 hours

Maximum marks: 70

**Note: Attempt all questions. Draw neat labelled diagrams wherever necessary. Write answer in separate answer book for Part A and Part B.**

**Part A**  
**(Physiology)**

**(35 Marks)**

Q.1. What is erythropoiesis? Name the sites of erythropoiesis in an adult. Describe the process of erythropoiesis. Briefly describe the factors affecting erythropoiesis.

**(15 Marks)**

Q.2. Write short notes on the following :

**(5 Marks Each)**

- (a) Passive transport
- (b) Mechanism of HCL secretion
- (c) Oxygen-Haemoglobin Dissociation Curve

Q.3. Multiple Choice Questions:

**(1 Mark Each)**

(a) **Gatekeeper of the Heart is:**

- (i) SA Node
- (ii) AV Node
- (iii) Purkinje Fibres
- (iv) Bundle of His

(b) **Used to measure GFR:**

- (i) Inulin
- (ii) PAH
- (iii) Hippurate
- (iv) D<sub>2</sub>O

(c) **Lesions of lateral cerebellum cause all of the following except:**

- (i) Incoordination
- (ii) Intention tremor
- (iii) Resting tremor
- (iv) Ataxia

(d) **QRS complex of ECG indicates:**

- (i) Atrial Repolarization
- (ii) Atrial Depolarization
- (iii) Ventricular Repolarization
- (iv) Ventricular Depolarization

(e) **Which of the following is not seen in human?**

- (i) Estrous cycle
- (ii) Menstrual cycle
- (iii) Endometrial cycle
- (iv) Ovarian Cycle

**Conti..2..**

**Part B**  
**(Biochemistry)**

(35 Marks)

- Q.1. Given an account on how fatty acids are activated and transported into the mitochondria. Describe the reactions of  $\beta$ -oxidation of fatty acids in the mitochondrial matrix. Add a note on ATP yield from palmitic acid. (15 Marks)
- Q.2. Write short Notes on the following: (5 Marks Each)
- (a) Significance of HMP shunt
  - (b) Biochemical role of vitamin D
  - (c) Uncouplers
- Q.3. Multiple Choice Questions. (1 Mark Each)
- (a) **The Enzyme defect in Von-Gierke's disease is:**
- |                             |                                 |
|-----------------------------|---------------------------------|
| (i) Glycogen phosphorylase  | (ii) Phosphoglucomutase         |
| (iii) Glucose-6-phosphatase | (iv) $\alpha$ -1, 6 glucosidase |
- (b) **All of the following are considered as anti-mutagens, EXCEPT:-**
- |                         |                 |
|-------------------------|-----------------|
| (i) Vitamin E           | (ii) Vitamin B6 |
| (iii) $\beta$ -Carotene | (iv) Curcumin   |
- (c) **The following amino acid is considered to be most effective contributor to the buffering action of proteins:-**
- |               |                 |
|---------------|-----------------|
| (i) Histidine | (ii) Arginine   |
| (iii) Lysine  | (iv) Methionine |
- (d) **Which of the following enzymes of heme biosynthesis is dependent on pyridoxal phosphate (PLP)?**
- |                    |                      |
|--------------------|----------------------|
| (i) PBG synthase   | (ii) Ferrocheletase  |
| (iii) ALA synthase | (iv) ALA dehydratase |
- (e) **Insulin actions on glucose metabolism include all of the following EXCEPT:-**
- |                                |                                  |
|--------------------------------|----------------------------------|
| (i) Promote glucose uptake     | (ii) Increase glycogen synthesis |
| (iii) Increase gluconeogenesis | (iv) Inhibit glycogen breakdown  |



**Paper Code : 12002**  
**BDS First Year**  
**University Main/Supple. Examination – November 2020**  
**Physiology and Biochemistry**  
**Paper Second**

TIME: 3 hours

Maximum marks: 70

**Note: Attempt all questions. Draw neat labelled diagrams wherever necessary. Write answer in separate answer book for Part A and Part B. Parts of a question must be answered together.**

**Part A**

**(35 Marks)**

**(Human Physiology)**

- Q.1. Discuss the mechanism of HCL secretion in stomach & its applied aspect. **(15 Marks)**
- Q.2. Write short notes on the following : **(5 Marks Each)**
- (a) ECG wave
  - (b) Chloride shift
  - (c) Plasma protein
- Q.3. Multiple Choice Question: **(1 Mark Each)**
- (a) **Action potential is produced by:**
    - (i)  $\text{Na}^+$  influx
    - (ii)  $\text{Na}^+$  influx and  $\text{K}^+$  efflux
    - (iii)  $\text{K}^+$  influx
    - (iv)  $\text{K}^+$  efflux
  - (b) **Clinically, jaundice is first detected in the:**
    - (i) Skin
    - (ii) Mucous membranes
    - (iii) Plasma
    - (iv) Sclera
  - (c) **Smallest blood cell is:**
    - (i) Small lymphocyte
    - (ii) RBC
    - (iii) Platelet
    - (iv) Neutrophil
  - (d) **Gastric secretion is decreased by:**
    - (i) Somatostatin
    - (ii) Gastrin
    - (iii) Histamine
    - (iv) Acetyl choline
  - (e) **Plateau phase of action potential is seen in :**
    - (i) SA node
    - (ii) Av node
    - (iii) Purkinje fibers
    - (iv) Ventricular fibers

**Conti..2..**

**Part B**  
**(Biochemistry)**

**(35 Marks)**

Q.1. Define glycolysis with energetics and its regulation.

**(15 Marks)**

Q.2. Write short Notes on the following:

**(5 Marks Each)**

- (a) Essential amino acids
- (b) Classify vitamins
- (c) Co Enzymes

Q.3. Multiple Choice Questions.

**(1 Mark Each)**

**(a) Beri Beri is due to the deficiency of vitamin-**

- (i) B<sub>1</sub>
- (ii) B<sub>2</sub>
- (iii) B<sub>6</sub>
- (iv) B<sub>12</sub>

**(b) Normal fasting plasma glucose levels -**

- (i) 80-140 mg/dl
- (ii) 70-100 mg/dl
- (iii) 90-150 mg/dl
- (iv) 70-110 mg/dl

**(c) Night blindness is due to the deficiency of vitamin-**

- (i) D
- (ii) E
- (iii) A
- (iv) K

**(d) The sugar found in DNA is -**

- (i) Xylose
- (ii) Ribose
- (iii) De Oxy Ribose
- (iv) Ribulose

**(e) D-Fructose is a -**

- (i) Triose
- (ii) Pentose
- (iii) Tetrose
- (iv) Hexose

**Paper Code : 12002**  
**BDS 1<sup>st</sup> Year**  
**University Main Examination – 2018**  
**Paper Second**  
**Human Physiology & Biochemistry**

TIME: 3 hours

Maximum marks: 70

**Note: Attempt all questions. Draw neat labelled diagrams wherever necessary. Use separate answer book for Part A and Part B.**

**Part A**

(35 Marks)

- Q.1. Classify and describe the morphology, properties and functions of leucocytes. Briefly describe the role of lymphocytes in immunity. (15 Marks)
- Q.2. Write short notes on the following : (5×3=15 Marks)
- (a) Composition and functions of saliva
  - (b) Factors affecting heart rate
  - (c) Primary and secondary active transport
- Q.3. Multiple Choice Questions : (1×5=5 Marks)
- (a) **Conjugation of bilirubin occurs in-**  
(i) Enterocytes (ii) Hepatocytes (iii) Granulocytes (iv) Erythrocytes
  - (b) **Juxta glomerular cells are located at-**  
(i) Afferent arteriole (ii) Efferent Arteriole (iii) Glomerular Tuft (iv) Distal convoluted Tubule
  - (c) **Vitamin K dependent clotting factors are-**  
(i) II, VII (ii) I, VII, X (iii) VII, IX, X (iv) II, VII, IX, X
  - (d) **Glucagon is produced by which cell of the pancreas?**  
(i) Alpha cells (ii) Beta cells (iii) Delta cells (iv) Gamma cells
  - (e) **Spirometry measures all except-**  
(i) Vital capacity (ii) Functional residual capacity (iii) Inspiratory reserve volume (iv) Functional residual volume

**Part B**

(35 Marks)

- Q.1. Classify vitamins. Describe the sources, active form, biochemical functions and disorders of vitamin B complex. (15 Marks)
- Q.2. Write short notes on the following : (5×3=15 Marks)
- (a) Essential fatty acid (b) Functions of calcium (c) Mitochondria
- Q.3. Multiple Choice Questions : (1×5=5 Marks)
- (a) **The element which prevents the development of dental caries is-**  
(i) Flourine (ii) Phosphate (iii) Calcium (iv) Iron
  - (b) **Pepsin belongs to which class of enzymes?**  
(i) Oxidoreductase (ii) Transferase (iii) Hydrolase (iv) Ligase
  - (c) **Start codon is-**  
(i) UAA (ii) UAG (iii) UGA (iv) AUG
  - (d) **Irreversible reactions in glycolysis are catalysed by all of the following except -**  
(i) Hexokinase (ii) Phospho Fructo Kinase (iii) Phosphoglycerate Kinase (iv) Pyruvate Kinase
  - (e) **Glycosaminid Glycan that serves as anticoagulant is -**  
(i) Heparin (ii) Hyaluronic Acid (iii) Chondroitin Sulphate (iv) Dermatan Sulphate

**Paper Code : 12002**  
**BDS (1<sup>st</sup> Year)**  
**Supplementary Examination, Nov. 2017**  
**Human Physiology & Biochemistry**  
**Paper Second**

Time : Three Hours

Maximum Marks : 70

Note : Attempt all questions. Draw neat labelled diagrams wherever necessary.  
Use separate answer books for Part-A and Part-B.

**Part-A**

(Max Marks : 35)

**(Human Physiology)**

- Q. No. 1. What is erythropoiesis? Describe the stages and factors influencing it .  
(Marks 15)
- Q. No. 2. Write short notes on the following; (Marks 5 each)
- (a) Frank-Starling law and its significance
  - (ii) Enterohepatic circulation of bile salts
  - (iii) Bohr's effect
- Q. No. 3. Tick the correct answer. Attempt all- (Marks 1 each)
- (i) The most common cause of secondary hypertension is-
    - (a) Renal diseases
    - (b) Thyrotoxicosis
    - (c) Oral contraceptive pills
    - (d) Pheochromocytoma
  - (ii) CSF pressure in the lying down posture is.....mm Hg<sup>2</sup>-
    - (a) 20-50
    - (b) 50-100
    - (c) 130-150
    - (d) 150-200
  - (iii) Germ cell is a-
    - (a) Haploid cell
    - (b) Diploid cell
    - (c) Zygote
    - (d) mature cell
  - (iv) The substance used for the estimation of GFR is-
    - (a) Insulin
    - (b) Inulin
    - (c) Renin
    - (d) Rennin
  - (v) Dorsal column tracts carry following sensations except-
    - (a) Pain
    - (b) Touch
    - (c) Pressure
    - (d) Vibration

P.T.O.

(Max Marks : 35)

**Part-B**

**(Biochemistry)**

Q. No. 1. Describe the reactions of the urea cycle. Discuss the interrelation of urea cycle and citric acid cycle. Add a note on the diagnostic significance of blood urea. (Marks 15)

Q. No. 2. Write short notes on the following; (Marks 5 each)

- (a) Significance of HMP shunt pathway
- (b) Homeostasis of blood calcium level
- (c) Functions of vitamin D

Q. No. 3. Tick the correct answer. Attempt all:- (Marks 1 each)

- (i) Which of the following amino acid has a hydroxyl group-
  - (a) Valine
  - (b) Threonine
  - (c) Leucine
  - (d) Histidine
- (ii) All are useful substances produced from cholesterol, except-
  - (a) Vitamin-D
  - (b) Bile pigments
  - (c) Bile Salts
  - (d) Cortisol
- (iii) Ketone bodies are produced mainly in-
  - (a) Liver
  - (b) Brain
  - (c) RBC
  - (d) Skeletal
- (iv) Basal metabolic rate is increased by all the following except-
  - (a) Fever
  - (b) Thyroxine
  - (c) Starvation
  - (d) Cold climate
- (v) Scurvy is due to the deficiency of-
  - (a) Vitamin C
  - (b) Niacine
  - (c) Thiamine
  - (d) Riboflavin