

WEST BENGAL STATE UNIVERSITY
B.Sc. Major 1st Semester Examination, 2024-25
PHYDSC101T – PHYSIOLOGY (MAJOR)
FUNDAMENTALS OF ANATOMY AND PHYSIOLOGY

Time Allotted: 2 Hours

Full Marks: 50

GROUP – A

1. Answer any *five* questions from the following: 2x5=10
- a) State with an example, the concept of symport.
 - b) What are ionophores?
 - c) What is active transport?
 - d) Why is mitochondria called power house of the cell?
 - e) What are micelles?
 - f) Mention the role of p53 in cell cycle.
 - g) What do you mean by cell necrosis?
 - h) Name the different anatomical planes of human body.

GROUP – B

- Answer any *five* questions from the following: 2x5=10
- 2. a. Discuss in brief, about the cytoskeleton of a cell.
 - b. Describe the functions of smooth and rough endoplasmic reticulum. 4+4=8
 - 3. a. What is synaptonemal complex?
 - b. Describe the role of IP₃ and DAG in signal transduction. 4+4=8
 - 4. a. Explain the structure-function relationship of golgi bodies.
 - b. Describe the events that occur during the autophagic destruction of mitochondria. 4+4=8
 - 5. a. Write a brief note on CAM protein.
 - b. Highlight the role of JAK-STAT Pathway in the process of cell signalling. 4+4=8
 - 6. a. Differentiate between lysosome and peroxisome.
 - b. Discuss the role of cAMP as a second messenger. 4+4=8
 - 7. a. What are muscle spindles?
 - b. What is the function of kinesin?
 - c. Define chiasma and crossing over. 2+3+3=8
 - 8. a. What is the difference between senescence and cell ageing?
 - b. What are the symptoms of ageing?
 - c. How is ROS related to ageing? 2+3+3=8
 - 9. Write notes on the following: 4x2=8
 - a. Hydropathy plot
 - b. Aquaporins

Anandi Bagchi.

WEST BENGAL STATE UNIVERSITY
B.Sc. Major 3rd Semester Examination, 2024-25
PHYDSC303T – PHYSIOLOGY (MAJOR)
CHEMISTRY OF BIOMOLECULES

Time Allotted: 2 Hours

Full Marks: 50

GROUP – A

1. Answer any *five* questions from the following:

2x5=10

- a) State the characteristic of an optically active substance.
- b) Draw the structure of an amino acid which contains sulphhydryl group.
- c) Distinguish between fat and wax.
- d) What are imino acids?
- e) Why is cellulose not digested by the human body?
- f) Name 1 basic amino acid and 1 acidic amino acid.
- g) Write the differences between gluconic and glucuronic acids.
- h) Why are amino acids called ampholytes?

GROUP – B

Answer any *five* questions from the following:

8x5=40

2. a. What are epimers?

b. Explain anomerism with a suitable example.

c. How many isomers are possible in glucose molecule in its pyranose form?

2+4+2=8

3. a. Write the structure and chemical name of guanine.

b. What is T_m of DNA? State its significance.

c. What is pseudouridine?

2+(2+2)+2=8

4. a. Write the salient features of B-DNA.

b. What is a polycistronic mRNA?

c. Show the formation of a phosphodiester bond.

4+2+2=8

5. a. What is a liposome? State its importance

b. Differentiate between gangliosides and globosides..

c. Explain the term saponification.

(2+2)+2+2=8

6. a. Why is sucrose not a reducing sugar while its components are?

b. Discuss, with a suitable diagram, the clover leaf structure of t-RNA

3+5=8

7. a. Discuss the forces stabilizing higher structures of proteins.

b. Write the reaction sequence in the production of "Ruhemann's purple".

c. "Peptide bond is rigid and planar" – Explain.

3+2+3=8

8. a. "Glucose and galactose are epimers to each other" – Explain.

b. Write the differences between gluconic and glucuronic acids.

c. What is a micelle? State its physiological significance.

3+2+(2+1)=8

9. a. What is mutarotation? Explain with example.

b. What is RM number?

c. What are sphingolipids? Give an example.

4+2+(1+1)=8

Anandi Bagchi



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 1st Semester Examination, 2024-25

PHYACOR01T-PHYSIOLOGY (CC1)

CELLULAR BASIS OF PHYSIOLOGY

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.*

Answer any five questions from the following

8×5 = 40

1. (a) Describe the functions of smooth and rough endoplasmic reticulum. 4+4
(b) Describe the fluid mosaic model with diagram.
2. (a) Describe the role of microtubule in intracellular vesicular transport. 4+4
(b) Describe the structure and function of Na⁺-K⁺ ATPase pump.
3. Differentiate between the following: 4×2 = 8
(a) Microfilaments and Microtubules
(b) Lysosome and peroxisome.
4. (a) Discuss the role of IP3 and DAG in cellular signalling. 4+2+2
(b) What is p53? Mention its role in cell cycle.
(c) What is symport?
5. (a) What is lipid rafts? 2+4+2
(b) Describe the events that occur during the autophagic destruction of mitochondria.
(c) What are micelles?
6. (a) What is active transport? 2+2+4
(b) Why mitochondria is called power house of cell?
(c) Discuss the role of cAMP in cell signalling.
7. (a) Describe the functions of Golgi apparatus. 4+1+3
(b) What do you mean by wear and tear?
(c) Describe the genetic cellular theories of aging.
8. (a) What is synaptonemal complex? 4+4
(b) What is JAK-STAT pathway?

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WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 1st Semester Examination, 2024-25

PHYACOR02T-PHYSIOLOGY (CC2)

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.*

Answer any five questions from the following

8×5 = 40

1. What is colloid? Explain biological importance of colloids. 2+6
2. Write notes on any *two* of the following: 4+4
 - (a) Osmometer
 - (b) Sol-gel transformation
 - (c) Tyndall effect
 - (d) Living body as a thermodynamic system.
3. (a) Describe the Helmholtz-Gouy double layer and give the significance of zeta potential. 5+3
(b) What is reverse osmosis?
4. (a) What is isoelectric pH? 2+2+2+2
(b) What is salting out?
(c) What is critical point?
(d) What is Gold number?
5. (a) What are the differences between Lyophilic sol and Lyophobic sol? 4+4
(b) Mention any two biological significances of diffusion.
6. (a) Deduce Henderson-Hasselbalch Equation. Mention its significance. 6+2
(b) Distinguish between dialysis and ultrafiltration.
7. (a) Derive the Michaelis-Menten equation of enzyme kinetics. 4+4
(b) Compare the kinetic parameters of competitive, non-competitive and un-competitive enzyme inhibitions.
8. (a) State and explain the mathematical expression of the first law of thermodynamics along with proper sign conventions with respect to work done. 2+2+4
(b) Why is work considered to be path function? State the criteria of spontaneity of a chemical reaction.

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WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 3rd Semester Examination, 2024-25

PHYACOR07T-PHYSIOLOGY (CC7)

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.

Answer any five questions from the following

8×5 = 40

1. (a) What is Papez circuit? 2
 (b) Describe the role of limbic system in emotional behavior. 4
 (c) Mention the behavioral changes in Kluver-Bucy syndrome. 2
2. (a) State the anatomical parts of basal ganglia. 2
 (b) Write the role of basal ganglia in axial and girdle movement. 3
 (c) What are thalamic nuclei? 3
3. (a) How does thalamus take part in relay function? 3
 (b) What is thalamic animal? State the syndromes of thalamic animal. 2+3
4. (a) Describe the histological structure of neocortex. 3 *not layer, outer granular cell layer, outer cell layer, inner " " " " inner* 3 *pyramidal cell layer, multiform*
 (b) Distinguish between projection, association and commissural fibers of cerebral cortex. 3
 (c) What are mossy and climbing fibers? 2 *axons of dentate granule cells in hippocampus series of neuronal projecⁿ from inf. olivary nucleus located in medulla oblongata.*
5. (a) What are cerebellar nuclei? 3
 (b) What is 'servo mechanism'? How does cerebellum control voluntary movement by 'servo mechanism'? 1+3
 (c) What is corpus cerebelli? *cerebellum* 1
6. (a) Describe the role of hypothalamus in regulation of body water. 3
 (b) What do you mean by parasympathetic division? 2
 (c) What is silent area? *cerebellum, stimulation does not give rise to any sensaⁿ cause no motor movts.* 1
 (d) What are neurohormones? 2
7. (a) What are Herring bodies? *neurosecretory bodies in post. pituitary - terminal ends of axons from hypoth.* 2
 (b) Write the name, origin, extension and termination of the tract which carries kinesthetic sensation from lower part of the body. 1+1+3+1 *ventral spinocerebellar tract*
8. (a) Write the difference between REM and non-REM sleep. 3
 (b) What do you mean by K-complex? *stage 2 of NREM sleep. Biphasic, lasts > 0.5s* 2
 (c) Mention the volume of CSF in human brain. *short +ve, large -ve, long-lasting +ve peak* 1
 (d) Write the clinical significance of EEG. *125 - 150 ml. Maintenance of sleep, arousal from sleep, memory consolidation, maintenance of synapse homeostasis.* 2

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WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 5th Semester Examination, 2024-25

PHYACOR11T-PHYSIOLOGY (CC11)

SPECIAL SENSES

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.
All symbols are of usual significance.*

Answer any five questions from the following

8×5 = 40

1. (a) What do you mean by diopetre and scotoma? 2+2+4
(b) What is electro-olfactogram?
(c) Trace the pathway for accommodation.
2. (a) What is conjunctiva? Write its functions. 2+4+2
(b) Describe the neural mechanism of color vision.
(c) What do you mean by homonymous hemianopsia?
3. (a) What is hypermetropia? How can it be corrected? 2+3+3
(b) How sound intensities can be discriminated at different levels of the auditory system?
(c) What are the different types of odor?
4. (a) Discuss the neural basis of olfaction. 4+4
(b) What are the theories of pitch discrimination?
5. (a) Discuss the role of stereocilium and kinocilium in audition. 3+2+3
(b) What are the characteristics of odor producing molecules?
(c) What are odor binding proteins (OBP)? Write its role in olfaction.
6. (a) What is nyctalopia and how is it caused? 2+2+(1+3)
(b) What is spherical aberration?
(c) What is aqueous humor? Describe its functions.
7. (a) Describe the structure of rod and cone with special reference to the structure of their outer segment. 4+4
(b) Write a short note on conductive deafness.
8. (a) Write a short note on cochlear microphonic potential. 4+4
(b) What are the different types of ganglion cells?

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