

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2024
(First Semester)
Branch - **BIOCHEMISTRY**

SUBCELLULAR BIOCHEMISTRY

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Omit the eukaryotic cell mentioned below a) Plants b) Animals c) Yeast d) E.coli	K1	CO1
	2	Which determine the cell surface characteristics? a) Cell membrane b) Golgi c) Nucleus d) Mitochondria	K2	CO1
2	3	The gas exchange in alveoli cells of lungs belongs to a) Active b) Passive c) diffusion d) jumping	K1	CO2
	4	Calcium pump is a type of ____ transport a) Movement b) Passive c) Active d) ion carrier	K2	CO2
3	5	____ organelle involved in beta oxidation of fatty acid a) Mitochondria b) Cell membrane c) Golgi d) Glyoxysomes	K1	CO3
	6	Identify the suicidal bags that has digestive enzymes a) Nucleus b) Cell membrane c) Golgi d) Lysosomes	K2	CO3
4	7	In what way mitochondria produce energy inside the cell? a) Detoxification b) Photosynthesis c) Oxidative phosphorylation d) Non oxidative phosphorylation	K1	CO4
	8	Which organelle is the largest one in the cell? a) Nucleus b) ER c) Peroxisome d) Lysosome	K2	CO4
5	9	____ helps in sticking of molecules in ECF and its transport a) Bone cells b) CME c) CAM d) CAE	K1	CO5
	10	Find the protein that provides stretchy character to blood vessels a) Ferrulin b) erythropoietin c) Fibrinogen d) Elastin	K2	CO5

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	List out the components of plasma membrane.	K1	CO1
		(OR)		
	11.b.	Discuss the different models of plasma membrane and define it.		

Cont...

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2	12.a.	Imply the role of ion carriers in transport of ions through ion channels.	K1	CO2
	(OR)			
	12.b.	With reference to glucose transport , explain active transport system.		
3	13.a.	Draw neatly the structure of lysosomes and mention the components in it.	K2	CO3
	(OR)			
	13.b.	How glyoxysomes helps in seed germination?		
4	14.a.	Find the various forms of golgi and give its functions.	K2	CO4
	(OR)			
	14.b.	Highlight the significance of nucleus in gene transfer.		
5	15.a.	How tight junctions help in transporting solute molecules?	K2	CO5
	(OR)			
	15.b.	Summarize the various functions of ECM.		

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Outline about the Red cell membrane proteins.	K2	CO1
2	17	With a neat sketch and example, explain about the symport and antiport.	K2	CO2
3	18	Specify the ultra structure of cilia and flagella.	K2	CO3
4	19	In what way golgi bodies helps in sorting?	K2	CO4
5	20	Summarize the role of collagen and Elastin in our body.	K2	CO5

Z-Z-Z END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2024
(First Semester)

Branch - **BIOCHEMISTRY**

STRUCTURAL BIOCHEMISTRY

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

$$(10 \times 1 = 10)$$

Module No.	Question No.	Question	K Level	CO
1	1	What is coordinate bonding? a) Bonding where atoms share electrons equally b) Bonding where atoms transfer electrons completely c) Bonding where both electrons are provided by one atom d) Bonding where electrons are shared unequally	K1	CO1
	2	Define hydrophobic interactions. a) Interactions between polar molecules b) Attraction between water and nonpolar molecules c) Repulsion between water and nonpolar molecules d) Bonding between hydrophilic substances	K2	CO1
2	3	Give an example of a polysaccharide. a) Glucose b) Sucrose c) Glycogen d) Fructose	K1	CO2
	4	Differentiate between amylose and amylopectin. a) Amylose is branched, while amylopectin is unbranched b) Amylose is unbranched, while amylopectin is branched c) Both are branched polysaccharides d) Both are unbranched polysaccharides	K2	CO2
3	5	What is a zwitterion? a) A molecule with a positive charge only b) A molecule with a negative charge only c) A molecule with both positive and negative charges d) A molecule without any charge	K1	CO3
	6	Explain the role of enzymes in protein metabolism. a) Enzymes break down carbohydrates into amino acids b) Enzymes catalyze the synthesis and breakdown of proteins c) Enzymes store proteins in the liver d) Enzymes convert proteins into DNA	K2	CO3
4	7	Name two essential fatty acids. a) Stearic acid and Palmitic acid b) Linoleic acid and Alpha-linolenic acid c) Lauric acid and Oleic acid d) Butyric acid and Caproic acid	K1	CO4
	8	Pick out the Vitamin which spares the role of Hormone a) Vitamin A b) Vitamin B c) Vitamin D d) Vitamin K	K2	CO4

Cont...

5	9	What is the function of mRNA in protein synthesis? a) To store genetic information b) To carry amino acids to the ribosome c) To deliver the genetic code from DNA to the ribosome d) To synthesize DNA	K1	CO5
	10	Describe the structure of RNA. a) RNA is a double-stranded molecule like DNA b) RNA is a single-stranded molecule with ribose sugar c) RNA is a single-stranded molecule with deoxyribose sugar d) RNA is a double-stranded molecule with ribose sugar	K2	CO5

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Discuss the role of hydrogen bonds in biological molecules.	K2	CO1
		(OR)		
	11.b.	Highlight the importance of ionic bonding in proteins.		
2	12.a.	How are carbohydrates classified, give their functions.	K3	CO2
		(OR)		
	12.b.	What are glycoproteins? Brief on their role.		
3	13.a.	Summarize the structure and biological importance of Peptide bond.	K3	CO3
		(OR)		
	13.b.	How are proteins Denatured? Compile its significance.		
4	14.a.	Describe the biological significance of fatty acids.	K3	CO4
		(OR)		
	14.b.	Outline the function of phospholipids in membranes.		
5	15.a.	Recall the process of transcription in prokaryotes.	K4	CO5
		(OR)		
	15.b.	Propose the process of translation and protein synthesis.		

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Discuss the types of chemical bonds found in proteins and their significance in maintaining structure.	K4	CO1
2	17	Summarize the structure and function of complex carbohydrates.	K5	CO2
3	18	Related the structure of proteins, including their classification based on function.	K5	CO3
4	19	Explain the role of lipids in human health and nutrition.	K5	CO4
5	20	Compile the biological importance of RNA in gene expression and regulation.	K5	CO5

Z-Z-Z END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2024
(First Semester)

Branch - BIOCHEMISTRY

GENERAL BIOLOGY

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which stage of <i>Taenia solium</i> is infective to pigs? a) Oncosphere b) Adult tapeworm c) Cysticercus d) Egg	K1	CO1
	2	What type of scales covers the body of a shark? a) Cycloid scales b) Ctenoid scales c) Placoid scales d) Ganoid scales	K2	CO1
2	3	What is the primary function of chromosomes? a) To store energy b) To carry genetic information c) To provide structural support to cells d) To facilitate cellular respiration	K1	CO2
	4	Klinefelter syndrome is typically diagnosed by: a) Measuring hormone levels b) Genetic testing (karyotyping) c) Physical examination alone d) Blood glucose testing	K2	CO2
3	5	Which blood group is known as the universal recipient? a) A b) B c) AB d) O	K1	CO3
	6	What is the primary source of extra chromosomal inheritance in eukaryotes? a) Mitochondrial DNA b) Nuclear DNA c) Ribosomal RNA d) Transfer RNA	K2	CO3
4	7	Which term describes the increase in homozygosity resulting from inbreeding? a) Genetic drift b) Inbreeding coefficient c) Genetic recombination d) Gene flow	K1	CO4
	8	Which practice is an example of eugenics? a) Implementing recycling programs b) Developing new vaccines c) Conducting gene therapy d) Designing new educational curricula	K2	CO4
5	9	Which of the following is an indicator of biological water pollution? a) High turbidity b) Low pH c) Presence of coliform bacteria d) High levels of dissolved oxygen	K1	CO5
	10	How does reforestation contribute to forest protection? a) It reduces biodiversity b) It replaces lost forest cover c) It increases soil erosion d) It promotes deforestation	K2	CO5

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SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the nervous system of cockroach.	K5	CO1
	(OR)			
	11.b.	Discover the circulatory system of sharks.		
2	12.a.	Describe the symptoms and diagnosis of Turner syndrome.	K4	CO2
	(OR)			
	12.b.	Identify the sex determination in a man. Include a diagram to illustrate the process.		
3	13.a.	Examine the causes of hemophilia and how they affect blood clotting.	K5	CO3
	(OR)			
	13.b.	Determine the skin color in humans with an example.		
4	14.a.	Explain the causes of phenylketonuria with a suitable example.	K4	CO4
	(OR)			
	14.b.	Extend the genetic basis of sickle cell anemia, and how is it inherited?		
5	15.a.	List the sources and control measures of water pollution	K4	CO5
	(OR)			
	15.b.	Explain the causes and control measures of air pollution.		

SECTION - C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Elaborate on the life cycle of <i>Entamoeba histolytica</i> .	K6	CO1
2	17	Discuss the structure and types of chromosome.	K6	CO2
3	18	Evaluate the importance of the Rh factor in blood group identification.	K5	CO3
4	19	Formulate the Hardy-Weinberg equilibrium and state the genetic variation within populations.	K6	CO4
5	20	Explain the structure and function of pond ecosystem.	K4	CO5

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2024
(Second Semester)

Branch - **BIOCHEMISTRY**
MICROBIOLOGY

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	What type of light is commonly used in a light microscope? a) Infrared light b) Ultraviolet light c) Visible light d) X-rays	K1	CO1
	2	Which of the following stains is commonly used as the primary stain in endospore staining procedures? a) Crystal violet b) Safranin c) Malachite green d) Methylene blue	K2	CO1
2	3	Which genus of actinomycetes is most commonly associated with antibiotic production? a) Streptomyces b) Bacillus c) Clostridium d) Lactobacillus	K1	CO2
	4	Fungi play an important role in which of the following industrial processes? a) Leather tanning b) Brewing and baking c) Cement manufacturing d) Paper recycling	K2	CO2
3	5	What is the primary component of endotoxins in Gram-negative bacteria? a) Lipopolysaccharides (LPS) b) Peptidoglycan c) Teichoic acids d) Proteins	K1	CO3
	6	What type of vaccine is used to prevent chickenpox? a) Live attenuated vaccine b) Inactivated vaccine c) Subunit vaccine d) DNA vaccine	K2	CO3
4	7	Which of the following is a commonly used chemical mutagen? a) Ultraviolet radiation b) X-rays c) Ethyl methanesulfonate (EMS) d) Infrared light	K1	CO4
	8	What is the genome type of the SV40 virus? a) Single-stranded RNA b) Single-stranded DNA c) Double-stranded RNA d) Double-stranded DNA	K2	CO4
5	9	What is the primary function of Rhizobia in their symbiotic relationship with plants? a) Photosynthesis b) Nitrogen fixation c) Decomposition of organic matter d) Water absorption	K1	CO5

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5	10	Sulfur is mainly found in which form in the Earth's crust? a) Sulfides b) Sulfates c) Elemental sulfur d) Hydrogen sulfide	K2	CO5
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SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the principle and uses of phase contrast microscope.	K4	CO1
	(OR)			
	11.b.	Identify the Gram-staining technique. How does this method differentiate between Gram-positive and Gram-negative bacteria?		
2	12.a.	Classify the cyanobacteria with suitable example.	K4	CO2
	(OR)			
	12.b.	Describe the algae and their economic importance.		
3	13.a.	Discuss the typhoid fever caused by <i>Salmonella typhi</i> and state the primary mode of transmission.	K5	CO3
	(OR)			
	13.b.	Analyze the transmission of HIV/AIDS and their awareness.		
4	14.a.	Explore the mechanisms of physical mutagenesis and its types.	K6	CO4
	(OR)			
	14.b.	Evaluate the implications of the lysogenic cycle on the host bacterium.		
5	15.a.	Examine the relationship between the carbon cycle and climate change.	K5	CO5
	(OR)			
	15.b.	Assess the role of microbial communities in wastewater treatment processes.		

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Explain the principle and application of electron microscope.	K5	CO1
2	17	Discuss the life cycle of yeast and their significance.	K6	CO2
3	18	Analyze the primary modes of transmission for cholera and Investigate the role of vaccination in preventing cholera.	K4	CO3
4	19	Classify the DNA and RNA viruses and their features.	K4	CO4
5	20	Explain the processing techniques involved in penicillin production.	K5	CO5

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2024
(Second Semester)
Branch - **BIOCHEMISTRY**

ENZYMOLOGY

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	An enzyme is a biological _____ that speeds up chemical reactions in living organisms. a) substrate b) catalyst c) inhibitor d) product	K1	CO1
	2	The active site of an enzyme is the region where _____ binds and the reaction occurs. a) product b) substrate c) coenzyme d) water	K2	CO1
2	3	An example of an oxidoreductase enzyme is _____. a) Amylase b) Catalase c) Lipase d) Trypsin.	K1	CO2
	4	In enzyme kinetics, Km is the substrate concentration at which the reaction rate is _____ of its maximum value. a) 25% b) 50% c) 75% d) 100%	K2	CO2
3	5	Competitive inhibition occurs when an inhibitor binds to the _____ of an enzyme, preventing the substrate from binding. a) product b) allosteric site c) active site d) coenzyme	K1	CO3
	6	In competitive inhibition, the inhibitor competes with the substrate for the active site, while in non-competitive inhibition, the inhibitor binds to _____. a) the active site b) a different site on the enzyme c) the substrate d) the product	K2	CO3
4	7	An isozyme involved in metabolism is _____. a) Lactase b) Hexokinase c) Amylase d) Lipase	K1	CO4
	8	The role of lactate dehydrogenase is to convert pyruvate into _____ during anaerobic respiration. a) glucose b) acetyl-CoA c) lactate d) ethanol?	K2	CO4
5	9	A therapeutic enzyme used in clinical diagnostics is _____. a) Streptokinase b) Trypsin c) Amylase d) Lipase	K1	CO5
	10	Enzyme immobilization refers to the technique of attaching enzymes to a _____ to improve their stability and reusability. a) substrate b) product c) solid support d) enzyme	K2	CO5

Cont...

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the structure and function of NAD ⁺ in enzymatic reactions.	K2	CO1
		(OR)		
	11.b.	Describe the role of coenzymes in enzyme activity.		
2	12.a.	Discuss the Michaelis-Menten equation and its significance in enzyme kinetics.	K3	CO2
		(OR)		
	12.b.	Explain the concept of V _{max} in enzyme reactions.		
3	13.a.	Describe the mechanism of enzyme inhibition using the example of competitive inhibition.	K3	CO3
		(OR)		
	13.b.	Differentiate between reversible and irreversible enzyme inhibitors.		
4	14.a.	Discuss the importance of isozymes in clinical diagnosis	K3	CO4
		(OR)		
	14.b.	Explain the role of pyruvate dehydrogenase in cellular metabolism.		
5	15.a.	Explain enzyme immobilization techniques and their applications in industry.	K4	CO5
		(OR)		
	15.b.	Discuss the use of enzymes in the food industry, focusing on amylases.		

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Describe the isolation and purification methods of enzymes from biological tissues.	K4	CO1
2	17	Explain the role of allosteric regulation in enzyme activity.	K5	CO2
3	18	Discuss the different types of enzyme inhibition and their mechanisms.	K5	CO3
4	19	Explain the importance of enzyme kinetics in understanding metabolic pathways.	K5	CO4
5	20	Discuss the role of enzymes in biotechnology and their applications.	K5	CO5

Z-Z-Z END

SECTION - B (35 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain rolling circle mode of replication.	K2	CO1
	(OR)			
	11.b.	Show DNA is the Genetic Material.		
2	12.a.	Develop the Role of transcription factors.	K3	CO2
	(OR)			
	12.b.	Identify the importance of Eukaryotic RNA polymerases.		
3	13.a.	Construct the salient features of genetic code.	K3	CO3
	(OR)			
	13.b.	Build on prokaryotic ribosome.		
4	14.a.	Experiment with deamination process.	K4	CO4
	(OR)			
	14.b.	Categorize the salient features of Trp operon.		
5	15.a.	Examine non-composite transposons.	K4	CO5
	(OR)			
	15.b.	Conclude frame shift mutation.		

SECTION - C (30 Marks)Answer any **THREE** Questions**ALL** Questions Carry **EQUAL** Marks (3 x 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Examine any one gene transfer mechanism in microorganism.	K4	CO1
2	17	Assess the mechanism of DNA transcription in prokaryotes.	K5	CO2
3	18	Analyse the post translational modification of proteins.	K4	CO3
4	19	Distinguish between SOS and Mismatch repair mechanism.	K4	CO4
5	20	Evaluate the Holliday model of homologous recombination.	K5	CO5

Z-Z-Z END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2024
(Third Semester)

Branch - **BIOCHEMISTRY**

BIOCHEMICAL TECHNIQUES

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	_____ is defined as the number of moles per liter of solution a) Molarity b) Molality c) Normality d) Percentage	K2	CO1
	2	Find out the solution with same molality and molarity a) Aqueous b) weak aqueous c) Strong d) Acid	K2	
2	3	To determine the concentration of a substance which law is applicable? a) Beer b) Lambert c) Beer lambert d) Kohlrausch's	K2	CO2
	4	The wavelength of blue colour ranges from _____ nm a) 400-420 b) 420-440 c) 440-490 d) 570-585	K2	
3	5	Mention the technique used to separate complex mixtures a) Chromatography b) colorimetry c) Calorimetry d) UV Spectrometry	K2	CO3
	6	Identify the spraying chemical used in identifying amino acids in paper chromatography a) Protein b) Acetone c) Chloroform d) Ninhydrin	K2	
4	7	In what way DNA molecules are separated in electrophoresis? a) Shape b) Molecular size c) Chemical nature d) pores	K2	CO4
	8	Find out the technique used to separate proteins based on size and shape a) SDS PAGE b) Agarose c) SDS d) Acrylamide	K2	
5	9	The DNA in genes are affected by ionizing radiation is a) degradation b) Decomposition c) radioactive decay d) Radio emission	K2	CO5
	10	What type of disease are analysed by using radioactive substances? a) cardiac b) Cancer c) GI tract d) All	K2	

SECTION - B (35 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Define saline solutions. Mention the pH of the solution. How it is prepared and what is its significance?	K2	CO1
		(OR)		
	11.b.	Derive HH equation and mention its significance.		

Cont...

2	12.a.	Brief the use of colorimeter in determining the concentration of a substance with reference to Beer Lamberts law.	K2	CO2
	(OR)			
	12.b.	Mention about the applications of fluorimetry.		
3	13.a.	In what way chromatographic techniques help in finding compounds in a sample. Report on it.	K2	CO3
	(OR)			
	13.b.	Using ligand how molecules are separated in affinity chromatography?		
4	14.a.	Write the principle of electrophoresis and mention the factors affecting mobility of molecules.	K2	CO4
	(OR)			
	14.b.	Highlights the significance of density gradient centrifugation. Explain how cell organelles are separated while using technique?		
5	15.a.	Using Geiger- Muller counter how diseases are identified by measuring radioactivity?	K2	CO5
	(OR)			
	15.b.	With an example specify how to apply the use of radio isotopes in medical diagnosis.		

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks (3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Outline about the buffer systems of blood.	K2	CO1
2	17	Specify the working principle of GCMS and explain how it helps to detect the compounds present in a solution.	K2	CO2
3	18	By using ion exchange resins how molecules are separated using ion exchange chromatography.	K2	CO3
4	19	Mention the instrumentation procedure for density gradient centrifugation.	K2	CO4
5	20	With a simple example explain about the autoradiography.	K2	CO5

Z-Z-Z END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2024
(Fourth Semester)

Branch – BIOCHEMISTRY

BASICS OF IMMUNOLOGY

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (5 x 1 = 5)

1.Name the surface of a large antigen on which the antibody binds.

- | | |
|-----------------|---------------|
| (i) Active site | (ii) Epitope |
| (iii) Hapten | (iv) Adjuvant |

2.Label the immature macrophage.

- | | |
|-----------------|--------------------|
| (i) Histiocytes | (ii) Microglia |
| (iii) Monocytes | (iv) Kupffer cells |

3.Name the antibody which is present in the Seminal fluid.

- | | |
|-----------|----------|
| (i) IgA | (ii) IgG |
| (iii) IgM | (iv) IgE |

4.Find the cells from which Myeloma cells arise.

- | | |
|--------------------------|-------------------|
| (i) Immature lymphocytes | (ii) Macrophages |
| (iii) Memory cells | (iv) Plasma cells |

5.Name the type of Graft rejection in Human beings.

- | | |
|------------------------------|-----------------------|
| (i) Antibody mediated | (ii) Autoimmunity |
| (iii) Cell mediated immunity | (iv) Hypersensitivity |

SECTION - B (15 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a.State the Biochemical factors that contribute Innate immunity.

OR

b.Bring out the essential features of Antigens.

7 a.Outline the phenomenon of Phagocytosis.

OR

b.Show the morphology and functions of B-cells

8 a.Compare the types and subclasses of Immunoglobulins.

OR

b.Describe the mechanism of action and functions of Cytotoxic T-cells.

Cont...

- 9 a. Narrate the steps involved in Hybridoma production.

OR

- b. Analyze the principle and applications of RIA.

- 10 a. Describe HLA typing in brief.

OR

- b. Discuss the Immunization schedule for Children.

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 x 6 = 30)

- 11 a. Describe the structure and functions of Secondary Lymphoid organs.

OR

- b. Discuss briefly on Immunotolerance.

- 12 a. Distinguish the structure and functions of White blood cells.

OR

- b. Elucidate the mode of action of Cytokines.

- 13 a. Analyze the Agglutination reaction in vivo with an example.

OR

- b. Explain in detail about Cell mediated Delayed Hypersensitivity.

- 14 a. Elucidate the types of Complement components and their role.

OR

- b. Discuss the principle and applications of ELISA.

- 15 a. Explain the immunological abnormalities of AIDS.

OR

- b. Compare the causes, symptoms, diagnosis and treatment of Rheumatoid arthritis and Systemic Lupus Erythematosus.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2024
(Fifth Semester)

Branch – BIOCHEMISTRY

TISSUE CULTURE & BIOTECHNOLOGY

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (5 x 1 = 5)

1. The pair of hormones required for a callus to differentiate are _____.
i) Auxin and cytokinin ii) Ethylene and Auxin
iii) Auxin and Absciscic acid iv) Cytokinin and gibberellins
2. In plant tissue culture, what is term ORGANOGENESIS mean?
i) formation of callus culture ii) formation of root and shoot from callus culture
iii) genesis of plants iv) none of the above
3. Cell culture technique became simpler only after advent of
i) Antibiotics ii) Trypsin
iii) Cell culture media iv) All of the following
4. The first plasmid used for the production of recombinant insulin is
i) pUC 18 ii) Ti plasmid iii) ACY 17 iv) pBR 322
5. A collection of methods that allows correction of a gene that has been diagnosed in child/embryo is called _____.
i) cloning ii) gene therapy iii) chemotherapy iv) dialysis

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 3 = 15)

6. a) Give an Outline on the establishment Callus culture.
(OR)
b) Brief on Meristem Culture .
7. a) Paraphrase on Ti plasmid based vectors.
(OR)
b) How do Stress resistance plants survive?
8. a) What is Primary Culture? Give its properties.
(OR)
b) Brief on any one Transformation Techniques in Plants.
9. a) Compile the applications of Tissue Plasminogen Activator.
(OR)
b) Production of Vaccine using rDNA technology – Discuss.
10. a) Outline on Animal Pharming.
(OR)
b) Narrate on the treatment of Cystic fibrosis.

Cont...

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 x 6 = 30)

11. a) How will you Measure the viability of Cultured Cells ?
(OR)
b) Notes on i) Shoot tip culture
ii) Somatic embryogenesis
12. a) State the advantages of Plant virus as cloning vector.
(OR)
b) Paraphrase on Anti-Sense RNA technology.
13. a) Brief on Initiation, maintenance and storage of animal cells in culture.
(OR)
b) List out the Properties of transformed cells in culture.
14. a) Compile on the production of Recombinant protein from Animal Cell Culture.
(OR)
b) Sketch the steps involved in Monoclonal Antibody Production.
15. a) Highlight the Salient features of Human Genome Project .
(OR)
b) Discuss on the Approaches through Genetherapy.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2024
(Fifth Semester)

Branch – BIOCHEMISTRY

NANOBIOLOGY

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 Which of the following is a key characteristic of a nanosystem?
(i) Independent of size (ii) Exhibits size-dependent properties
(iii) Stable only at the macro level (iv) Stable at excited state
- 2 What is a buckyball?
(i) A spherical molecule made up of carbon atoms
(ii) A type of nanowire used in electronics
(iii) A device for imaging nanoscale materials
(iv) A type of soft lithography
- 3 Zeta Potential is used to measure which property of nanoparticles?
(i) Shape (ii) Magnetic properties
(iii) Surface charge (iv) Optical absorption
- 4 What is the function of a clottocyte in nanomedicine?
(i) Oxygen transport (ii) Fighting infections
(iii) Drug delivery (iv) Blood clotting
- 5 Biosensor chips work on the principle of converting a biological interaction into which type of signal?
(i) Mechanical (ii) Electrical
(iii) Optical (iv) Chemical

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a What is a nanosystem? Describe dimensionality and size-dependent phenomena in nanosystems.
OR
b Bring out the major challenges associated with the use of nanomaterials in biological systems?
- 7 a Describe the discovery and applications of buckyballs (fullerenes).
OR
b Elaborate the properties and applications of carbon nanotubes in molecular nanotechnology.
- 8 a Sol-gel technique is one of the chemical method for the nanoparticle synthesis. Explain.
OR
b Discuss the mode of operation of UV-Vis spectroscopy and explain its applications in nanoscience.

Cont...

- 9 a Describe the function of clottocytes and their role in the human body. How can they be applied in medical emergencies?
OR
b How can nanorobots assist the immune system, and what are their potential applications?
- 10 a Give the concept of nano pharmacology and its impact on modern pharmacology.
OR
b Narrate the potential applications and benefits of medibots.

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 x 6 = 30)

- 11 a Summarise the bottom-up and top-down approaches in molecular nanotechnology. How do they differ, and what are their respective advantages and disadvantages?
OR
b Examine the advantages and challenges of utilizing molecular self-assembly in nanotechnology.
- 12 a Elucidate how Dip-Pen Nanolithography (DPN) works and highlight its importance in nanofabrication.
OR
b Discuss the working principles of Atomic Force Microscopy (AFM) and its applications in nanotechnology research.
- 13 a Explain the working principle of Scanning Electron Microscopy (SEM) and its applications in nanoparticle characterization.
OR
b Justify the advantages of liposomes over other delivery systems in drug delivery.
- 14 a Explain electrospinning and its role in tissue engineering.
OR
b Compare and contrast the mechanisms of action of microbivores and the human immune system in pathogen destruction. In what ways might microbivores enhance immune responses?
- 15 a Outline the principle and applications of biosensor chips in nanobiology. How do they contribute to diagnostics and monitoring of biological processes?
OR
b Discover the role and advantages of nanocapsules in drug delivery systems. How do they improve the pharmacokinetics and biodistribution of therapeutic agents?

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATIONS DECEMBER 2024
(Fifth semester)

Branch – BIOCHEMISTRY

INTERMEDIARY METABOLISM

Time: Three Hours

Maximum: 50 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 The magnitude of proton motive force depends on _____
i) Energy charge of cell ii) Permeability of membrane
iii) Number of ribosomes in cell iv) None of the mentioned
- 2 The enzyme aconitase is responsible for _____
i) polymerization ii) degradation
iii) assembly iv) isomerization
- 3 Which of these amino acids are not optically active?
i) Cysteine ii) Lysine
iii) Arginine iv) Glycine
- 4 What is lipolysis?
i) Hydrolysis of triacylglycerol ii) Formation of lipids
iii) Breakdown of ketone bodies iv) Formation of ketone bodies
- 5 During purine synthesis the activity of amidotransferase enzyme is inhibited by the antitumor agent, mark the correct one.
i) Aminopterin ii) Methotrexate
iii) Texol iv) Azaserine

SECTION - B (35 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

6. a. Write a role of ATP in metabolic reaction? Explain.

OR

b. Elucidate the important role of inophores.

- 7 a. Describe the pathway of HMP shunt.

OR

b. Give a note on glycogen metabolism.

- 8 a. Describe the biosynthesis of TAG.

OR

b. Establishment the synthesis of unsaturated fatty acids.

- 9 a. Discuss the biosynthesis of cysteine.

OR

b. Elucidate the mechanism of tryptophane.

Cont...

10 a. Write a note on sulphation process.

OR

b. List out inhibitors of purine metabolism.

SECTION - C (30 Marks)

Answer any **ALL** Questions

ALL Questions Carry **EQUAL** Marks

(5 X 6 = 30)

11. a. Describe the various phases in oxidative phosphorylation process.

OR

b. Mention the inhibitors of electron transport chain reaction.

12. a. Discuss the Embden Meyerhof pathway of glycolysis.

OR

b. Describe the significance and procedure of glucuronic acid cycle.

13. a. Elucidate the biosynthesis and catabolism of spingolipids.

OR

b. Describe the biosynthesis and degradation of phospholipids.

14. a. Outlined the cyclic pathway of urea.

OR

b. Enumerate the metabolism of alanine.

15. a. Explain the basic procedure of biosynthesis of purine.

OR

b. Evaluate the metabolism of nucleotide.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2024
(Fifth Semester)

Branch – BIOCHEMISTRY

COMPUTATIONAL TECHNIQUES IN BIOINFORMATICS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

1. URL stands for
(i) Unique resource Locator (ii) Universal resource Locator
(iii) Unique reference Locator (iv) United resource Locator
2. ----- is the primary component of PubMed.
(i) FASTA (ii) MEDLINE (iii) PDF (iv) BLAST
3. The general laboratory technique for determining the exact sequence of nucleotides or bases in a DNA molecule is -----.
(i) FASTA (ii) MEDLINE
(iii) DNA Sequence Data Base (iv) BLAST.
4. PHYLIP stands for -----.
(i) PHYLogentic Interface (ii) PHYLogentic Influence
(iii) PHYLogentic tree (iv) PHYLogeny Inference
5. Prediction of Activity Spectra for Substances (PASS) is a -----
(i) is a computer program that predicts the biological activity
(ii) is a computer hardware
(iii) is a tab
(iv) is a tool

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

6. a) Brief on Web Browser : HTML
(OR)
b) Comment on Modern Based Connections.
7. a) List out the applications of bioinformatics.
(OR)
b) What is PubMed called?
8. a) Narrate on popular protein sequence databases.
(OR)
b) Discuss about Sequence Retrieval System (SRS).
9. a) Outline on DNA and Protein Sequence Comparison.
(OR)
b) Elucidate on the importance of CLUSTAL W.
10. a) Paraphrase on Structure based Drug designing.
(OR)
b) Explain the steps involved in Downloading PDB file.

Cont...

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 x 6 = 30)

- 11 a) File Transfer Protocol.
(OR)
b) Enabling Local Area Connections.
- 12 a) Notes on i) Principles and ii) Challenges of Bioinformatics.
(OR)
b) How will you Access and save files using PubMed.
- 13 a) Describe on Protein sequence retrieval from NCBI.
(OR)
b) Outline the Applications of Sequin and Webin .
- 14 a) Differentiate between Local and Global Sequence Alignment.
(OR)
b) Review on Next generation sequencing Merit and Demerit.
- 15 a) Interpret Secondary structure prediction using protein sequencer.
(OR)
b) State the Tools for Ramachandran plot.

Z-Z-Z END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2024
(Fifth Semester)

Branch – BIOCHEMISTRY

MAJOR ELECTIVE COURSE – I PHYSIOLOGY AND ENDOCRINOLOGY

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 The partial pressure of CO₂ in venous blood is
(i) Greater than the tissue spaces (ii) Lesser than in the tissue spaces
(iii) Lesser than in the arterial blood (iv) Less than in alveoli
- 2 The right sequence of formation of urine is
(i) Secretion, reabsorption, filtration (ii) Reabsorption, filtration, secretion
(iii) Filtration, reabsorption, Secretion (iv) None of the above
- 3 The main cell type that produces CSF is _____
(i) Astrocyte (ii) Purkinje cell
(iii) Ependymal cell (iv) Schwann cell
- 4 Hypothalamic hormones are _____
(i) Peptides (ii) Steroids
(iii) Iodothyronines (iv) Amino acid derivatives
- 5 What is the name of the cells producing the hormone in adrenal medulla?
(i) F cells (ii) Chief cells
(iii) Principal cells (iv) Chromaffin cells

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a. Illustrate the role of GI tract hormones in digestion.

OR

b. Discuss the significance of chloride shift.
- 7 a. Explain the principle and working of ECG.

OR

b. Draw a neat sketch of the nephron and indicate the parts.
- 8 a. What are neurotransmitters? Mention their functions.

OR

b. Classify the neurons.

Cont...

- 9 a. Explain the mechanism of action of steroid hormones.

OR

- b. Summarize the signs and symptoms of thyrotoxicosis.

- 10 a. Illustrate the biosynthesis of melatonin.

OR

- b. Explain the process of steroidogenesis.

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks

(5 x 6 = 30)

- 11 a. Elucidate the pathways of blood coagulation.

OR

- b. Brief on the digestive process in the small intestine.

- 12 a. Describe the process of tubular reabsorption.

OR

- b. Explain the mechanism of actomyosin complex formation during muscle contraction.

- 13 a. Outline the mechanism of synaptic transmission.

OR

- b. Illustrate the events of the visual cycle.

- 14 a. Discuss the causes and symptoms of hypothyroidism.

OR

- b. Summarize on the effects of parathormone on blood calcium levels.

- 15 a. Outline the biosynthesis of epinephrine and norepinephrine.

OR

- b. Narrate the biological actions and disorders of ovarian hormones.

Z-Z-Z

END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2024
(Sixth Semester)

Branch – BIOCHEMISTRY
DISCIPLINE SPECIFIC ELECTIVE – II :
PHARMACOKINETICS & CLINICAL TRIAL

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 Identify the source of caffeine
 - i) Microbe
 - ii) animal
 - iii) plant
 - iv) genetic engineering
- 2 Which of the following route has 100% bioavailability?
 - i) Topical
 - ii) intravenous
 - iii) rectal
 - iv) oral
- 3 QSAR is an abbreviation for
 - i) Qualitative Structure Analysis Relationships
 - ii) Quiet Structure Analysis by Researchers
 - iii) Quantitative Structure-Activity Relationships
 - iv) Quick Structure Analysis Reasoning
4. The decrease in response to a drug that is used repeatedly and also requires higher amount of drug is needed to produce drug response is
 - i) drug resistance
 - ii) drug tolerance
 - iii) drug sensitivity
 - iv) drug effect
- 5 Identify the process ensures that clients possess the information necessary to make an informed decision about participation in biomedical study
 - i) Informed consent
 - ii) disclosure
 - iii) disclaimer
 - iv) participation consent

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a. Narrate on sources of drugs.
OR
b. Describe bacterial pharmacophore.
- 7 a. Explain the factors affecting drug absorption.
OR
b. Analyze the different routes of drug excretion.
- 8 a. Sketch the structure and mode of action on paracetamol.
OR
b. Discuss briefly on mechanism of action of L-dopa.
- 9 a. Describe on lipid and water-soluble drugs.
OR
b. Explain briefly on drug toxicity to man.

Cont...

- 10 a. Comment briefly on personalized drugs.
OR
b. Describe on ICMR ethical guidelines for Biomedical research on Human participants.

SECTION -C (30 Marks)

Answer ALL questions
ALL questions carry EQUAL Marks (5 x 6 = 30)

- 11 a. Categorize briefly on classification of drugs.
OR
b. Elucidate the MDR mechanism.
- 12 a. How drugs are absorbed at different sites of the body?
OR
b. Explain distribution of drug through blood brain barrier & vascular beds.
- 13 a. Discuss on classes of drugs acting on CNS with mechanism of action.
OR
b. Explain mode of action of Gentamycin and Streptomycin.
- 14 a. Discuss Phase I drug metabolism.
OR
b. Explain different reactions involved in Phase II drug metabolism.
- 15 a. Outline the different phases and types of clinical trials.
OR
b. Organize the roles and guidelines formed by CCSEA for care and use of animals in scientific research.

Z-Z-Z END

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2024
(Fifth Semester)

Branch – BIOCHEMISTRY

PHYSIOLOGY

Time: Three Hours

Maximum Marks: 75

SECTION – A (20 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10 X 2= 20)

1. List out any 4 digestive enzymes secreted by Pancreas.
2. What is meant by blood coagulation?
3. Define Micturition.
4. What is meant by muscle contraction?
5. Define Neuroglia.
6. What is CSF?
7. What are Second messengers?
8. Write about adrenal glands.
9. What is the function of the pituitary gland?
10. Write about pineal gland.

SECTION – B (25 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5X5= 25)

11. (A) What are the 4 steps in gas transport.
(OR)
(B) Write note on Components of Blood and blood group.
12. (A) Draw the structure of nephron.
(OR)
(B) Explain Skeletal Muscle contraction.
13. (A) Draw the structure of neuron.
(OR)
(B) Detail on Visual cycle.
14. (A) Write about c AMP.
(OR)
(B) Explain about functions of pancreatic hormones.
15. (A) Explain about Functions and regulations of ADH.
(OR)
(B) What are the functions of Ovaries?

SECTION – C (30 Marks)

Answer any THREE Questions

ALL Questions Carry EQUAL Marks (3X10=30)

16. Discuss about digestion and absorption in small intestine.
17. Write Note on Cardiac Cycle.
18. Explain about Neurotransmitters.
19. Describe about thyroid gland and functions of thyroid hormone.
20. Explain about hormones produced by Pituitary gland.

Z-Z-Z END