



# UNIVERSITY OF THE PUNJAB

**B.A. / B.Sc. Part-II**  
**Annual Exam - 2017**

Roll No. ....

**Subject: Biochemistry-II**  
**PAPER: A (Metabolism)**

**TIME ALLOWED: 3 hrs.**  
**MAX. MARKS: 40**

**Note: Attempt any Four Questions. All Questions carry equal marks.**

1. Explain the various reactions in Urea Cycle and their regulation.
2. Explain the pathway of glycogen breakdown
3. Describe mechanism of amino acid deamination, transamination and oxidative deamination
4. Discuss the oxidation of fatty acids and their regulation
5. Explain the of citric acid cycle and its bioenergetics
6. Write down the mechanism of electron transport chain
7. Write a note on the properties and functions of lipoproteins
8. Explain the following a) membrane transport b) synaptic transmission



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Roll No. ....

**Subject: Biochemistry-II**  
**PAPER: B (Molecular Biology)**

**TIME ALLOWED: 3 hrs.**  
**MAX. MARKS: 35**

**Note: Attempt Five Questions. Question No.1 is compulsory. All Questions carry equal marks.**

Q.1. Select the correct answer.

(7)

**i. Replication of DNA is possible due to?**

- a) Hydrogen bonding
- b) Phosphate backbone
- c) Complimentary base pairing
- d) None of above

**ii. The DNA chain acting as template for RNA synthesis has the following order of bases, AGCTTCGA. What will be the order of bases in mRNA**

- a) TCGAAGCT
- b) UGCUAGCT
- c) TCGAUCGU
- d) UCGAAGCU

**iii. Which of the following ions are required for the activity of Type II restriction enzymes**

- a)  $\text{Ca}^{2+}$
- b)  $\text{Mg}^{2+}$
- c)  $\text{Cl}^{2+}$
- d)  $\text{Mn}^{2+}$

**iv. RNA required for protein synthesis**

- a) mRNA
- b) rRNA
- c) tRNA
- d) all of these

**v. During translation, proteins are synthesized**

- a) by ribosome using the information on DNA
- b) by lysosome using the information on DNA
- c) by ribosome using the information on RNA
- d) by ribosome using the information on rRNA

**vi. Which molecule is required for the initiation of translation**

- a) ATP
- b) GTP
- c) CTP

P.T.O

d) TTP

**vii. During DNA replication, the synthesis of DNA on lagging strand takes place in segments, called**

- a) Satellite segments
- b) double helix segments
- c) Kornbeg segments
- d) Okazaki Sements

- Q.2. a) Describe how structure of DNA provide mechanism for heredity? (4)  
b) Explain the role of different enzymes in transcription. (3)
- Q.3. a) Discuss the key steps in making recombinant DNA . (4)  
b) Explain the function of following in the context of RNA . (3)  
I. Poly A tail  
II. Cap
- Q.4. Write down the differences between (3.5, 3.5)  
i. Bacteriophage Vector and Plasmid vector  
ii. DNA and RNA
- Q.5. Write a note on. (7)  
i. Southern Blotting  
ii. Agarose gel electrophoresis
- Q.6. a) Write down the function of following enzymes. (4)  
i. Methylase  
ii. DNase  
iii. Polymerase  
iv. Ligase  
b) What are restriction endonucleases. Describe different classes of restriction enzymes. (3)
- Q.7. Discuss DNA repair mechanism. also illustrate the mechanism with the help of suitable diagram (7)
- Q.8. Write a brief assay on translation and also discuss post translational modifications. (7)

15. Excretion through Malpighian tubules involves active transport of which ions into tubules from the surroundings
- |              |                 |
|--------------|-----------------|
| a) Potassium | b) Chloride     |
| c) Sodium    | d) All of above |
16. Telencephalon is part of the
- |                |              |
|----------------|--------------|
| a) Hind brain  | b) Midbrain  |
| c) Spinal cord | d) Forebrain |
17. Point of entry of sperm in frog egg
- |                       |                  |
|-----------------------|------------------|
| a) Animal pole        | b) Vegetal pole  |
| c) Gray crescent area | d) None of these |
18. Thermoregulatory center in mammals is located in:
- |                   |                  |
|-------------------|------------------|
| a) Pituitary body | b) Skin          |
| c) Hypothalamus   | d) Diencephalon. |
19. Muscle contraction is stimulated by
- |                  |                |
|------------------|----------------|
| a) Troponin      | b) Tropomyosin |
| c) Acetylcholine | d) Myosin      |
20. Protein produces number of calories per gram
- |        |        |
|--------|--------|
| a) 3.3 | b) 4.4 |
| c) 4.6 | d) 9.5 |

**Q2 Fill in the blanks**

$\frac{1}{2} \times 20 = 10$

1. -----includes all of those processes by which an animal takes in digest, absorbs, stores, and uses food (nutrients) to meet its metabolic needs.
2. In amphibians the cortical changes result in the formation of a -----on the egg, opposite to the point of sperm penetration.
3. Leeches and some insect larvae exhibit -----movement.
4. Pheromones are-----that affect the behavior of another individual of the same species.
5. -----occur when an animal is one sex during one phase of its life cycle and the opposite sex during another phase.
6. A -----consist of one motor nerve fibers and all the muscle fibers with which it communicates.
7. The gallbladder stores the greenish fluid called-----
8. Heat generation by shivering is called -----.
9. The controlling center for ovulation and menstruation is the -----.
10. -----respond to mechanically induced changes.
11. All photoreceptors possess light sensitive pigments. These pigments are -----.
12. The -----is the external covering of an animal.
13. The ----- of echinoderm provides a unique mean of locomotion.
14. The functional unit of a muscle myofibril is the -----.
15. Baleen plates are present in -----.
16. In a chemical synapse two cells communicate by means of a chemical agent called a - -----.
17. Flatworm's nervous system contains -----.
18. The endocrine system of a crustaceans, such as crayfish controls functions such as---- ----- and color change.
19. All vertebrates have a ----- circulatory system.
20. The outer protective covering of heart is -----.