

Exam Date & Time: 20-Sep-2021 (01:30 PM - 04:30 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

Biochemistry [PBT-BP203T]

Marks: 75

Duration: 180 mins.

I Multiple Choice Questions (MCQs)

Answer all the questions.

Section Duration: 30 mins

1) Study of energy changes in biochemical reactions is referred as

1) Enthalpy	2) Standard free energy	3) Biochemical thermodynamics	4) Catabolism
-------------	-------------------------	-------------------------------	---------------

(1)

2) An example of a high energy compound under the class thioesters is

1) ATP	2) 1,3-BPG	3) Phosphoenol pyruvate	4) Acetyl CoA
--------	------------	-------------------------	---------------

(1)

3) ATP is regarded as a High energy compound due to the presence of how many Phosphoanhydride bonds in triphosphate unit?

1) 01	2) 02	3) 03	4) 16
-------	-------	-------	-------

(1)

4) Metabolic reactions are mediated by

1) Energy	2) Electrons	3) Enzymes	4) Hormones
-----------	--------------	------------	-------------

(1)

5) The TWO similar reactions in the oxidation of glucose are

1) Pyruvate to Acetyl CoA and Alpha ketoglutarate to Succinyl CoA	2) Citrate to Isocitrate and Fumarate to Malate	3) Succinate to fumarate and fumarate to malate	4) Isocitrate to Oxalosuccinate and Oxalosuccinate to Alpha ketoglutarate
---	---	---	---

(1)

6) Which of the following is not a ketone body?

1) HMG CoA	2) Acetone	3) Acetoacetate	4) β -Hydroxy Butyrate
------------	------------	-----------------	------------------------------

(1)

7) The precursor of Arachidonic acid is

1) Palmitic acid	2) Oleic acid	3) Linolenic acid	4) Linoleic acid
------------------	---------------	-------------------	------------------

(1)

8) The number of Acetyl CoA generated when Palmitic acid undergoes complete oxidation is

1) 00	2) 04	3) 08	4) 16
-------	-------	-------	-------

(1)

9) Cholesterol possesses how many cyclohexane rings?

1) 01	2) 02	3) 03	4) 27
-------	-------	-------	-------

(1)

10) Which among the following is regarded as a true ketone?

1) Acetoacetyl CoA	2) Acetoacetate	3) Acetyl CoA	4) β -hydroxybutyrate
--------------------	-----------------	---------------	-----------------------------

(1)

11) An enzyme having no role during Heme degradation is

1) Haeme oxygenase	2) β -glucuronidase	3) Bilirubin glucuronyl transferase	4) Homogentisate oxidase
--------------------	---------------------------	-------------------------------------	--------------------------

(1)

12) During which two steps, does ATP get utilized in Urea cycle?

1) Synthesis of Carbamoyl Phosphate and Formation	2) Formation of Citrulline and Synthesis of Arginosuccinate	3) Synthesis of Carbamoyl Phosphate and Synthesis of Arginosuccinate	4) Synthesis of Carbamoyl Phosphate and Cleavage of Arginosuccinate
---	---	--	---

(1)

- | | | | | | | | | | |
|--|---------------|--|--|--|--|--|--|--|--|
| | of Citrulline | | | | | | | | |
|--|---------------|--|--|--|--|--|--|--|--|
- 13) The term 'Keto' is present in Phenylketonuria due to which of the following?
- | | | | | | | | | |
|----|----------------|----|-----------------|----|------------------|----|----------------|-----|
| 1) | Phenyl lactate | 2) | Phenyl Pyruvate | 3) | Phenyl Glutamine | 4) | Phenyl Acetate | (1) |
|----|----------------|----|-----------------|----|------------------|----|----------------|-----|
- 14) Richner-Hanhart syndrome is also known as
- | | | | | | | | | |
|----|---------------------|----|--------------------|----|----------------------|----|----------|-----|
| 1) | Tyrosinemia Type II | 2) | Tyrosinemia Type I | 3) | Neonatal Tyrosinemia | 4) | Albinism | (1) |
|----|---------------------|----|--------------------|----|----------------------|----|----------|-----|
- 15) Which of the following is a translation inhibitor?
- | | | | | | | | | |
|----|--------------|----|-----------|----|-------------|----|------------|-----|
| 1) | Erythromycin | 2) | Etoposide | 3) | Doxorubicin | 4) | Rifampicin | (1) |
|----|--------------|----|-----------|----|-------------|----|------------|-----|
- 16) The property of the genetic code by which multiple codons can code for the same amino acid is
- | | | | | | | | | |
|----|--------------|----|-------------|----|-----------------|----|------------|-----|
| 1) | Universality | 2) | Specificity | 3) | Non-overlapping | 4) | Degeneracy | (1) |
|----|--------------|----|-------------|----|-----------------|----|------------|-----|
- 17) Multiple forms of an enzyme catalyzing the same reaction is termed as
- | | | | | | | | | |
|----|----------|----|-----------|----|-------------------|----|-------------------|-----|
| 1) | Coenzyme | 2) | Isoenzyme | 3) | Diagnostic enzyme | 4) | Allosteric enzyme | (1) |
|----|----------|----|-----------|----|-------------------|----|-------------------|-----|
- 18) The enzymes that hold metal ions tightly are commonly known as
- | | | | | | | | | |
|----|----------------|----|------------|----|-------------|----|-------------------------|-----|
| 1) | Metalloenzymes | 2) | Isoenzymes | 3) | Holoenzymes | 4) | Metal activated enzymes | (1) |
|----|----------------|----|------------|----|-------------|----|-------------------------|-----|
- 19) The non-protein part of an enzyme is referred to as
- | | | | | | | | | |
|----|-----------|----|----------|----|------------|----|---------|-----|
| 1) | Apoenzyme | 2) | Coenzyme | 3) | Holoenzyme | 4) | Isozyme | (1) |
|----|-----------|----|----------|----|------------|----|---------|-----|
- 20) A coenzyme not related to B-complex vitamin is
- | | | | | | | | | |
|----|-----------------------|----|-----------------------------------|----|------------------|----|---------------------|-----|
| 1) | Flavin mononucleotide | 2) | Nicotinamide Adenine Dinucleotide | 3) | Tetrahydrofolate | 4) | Uridine Diphosphate | (1) |
|----|-----------------------|----|-----------------------------------|----|------------------|----|---------------------|-----|

II Long Answers

Answer all the questions.

- 1) A. Sketch the reactions of Phase I and II of EMP pathway. [5]
- B. Define gluconeogenesis, enlist the substrates and sketch the first bypass step of gluconeogenesis from the end product of aerobic glycolysis. [1+1+3] (10)
- 2) Explain the following with respect to nucleic acid metabolism: [2.5 x 4 = 10]
- a) Formation of complimentary strands in DNA replication
- b) Post transcriptional modification for mRNA synthesis (10)
- c) Elongation step in translation
- d) Cloverleaf structure of tRNA

III Short Answers

Answer all the questions.

- 1) Define the terms exergonic and endergonic reactions with an example for each. Add a note on redox potential. (5)
- 2) A. Sketch glycerol phosphate shuttle [2.5]
- B. Give the diagrammatic representation of the Rotary Motor model of ATP generation [2.5] (5)
- 3) A. 'During De novo synthesis, out of the 16 carbons that Palmitic acid possesses, 2 carbons are obtained directly through a molecule of acetyl CoA, whereas the remaining are obtained from Malonyl CoA'. Justify the given statement. [2m] (5)
- B. Sketch the steps involved in the synthesis of acetyl CoA from ketone bodies. [3]
- 4) Sketch the Krebs-Henseleit cycle. (5)
- 5) Sketch the catabolism of IMP and write a note on the drug of choice for the treatment of primary gout. (5)

- 6) "Enzymes are regarded as biological catalysts". Justify the given statement with pictorial representation (5) and relevant facts to support the same.
- 7) Define enzymes. Enlist any four properties of enzymes and write briefly on their nomenclature. (5)

-----End-----

