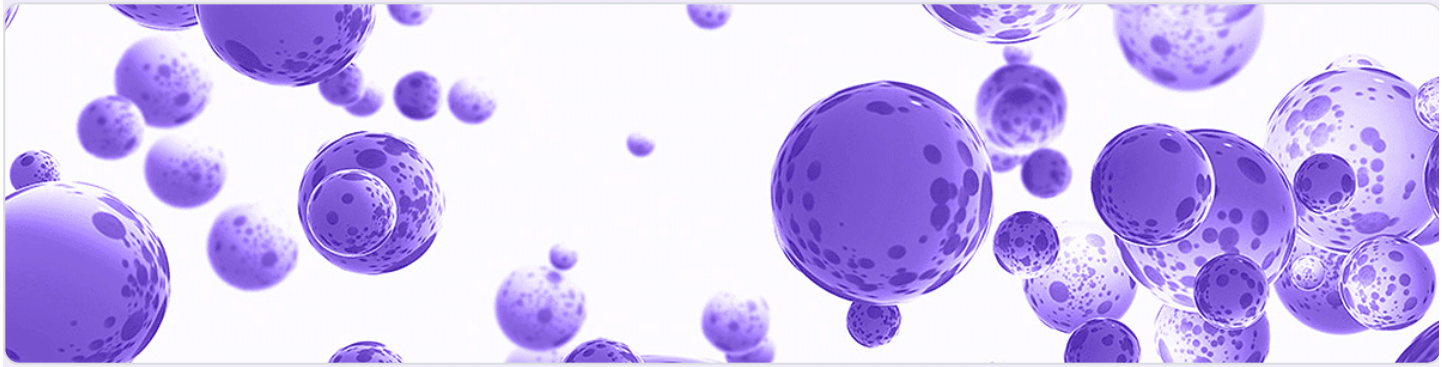
Metabolism of Biomolecules - Continuous Assessment I

Questions Responses 26 Total points: 60



Section 1 of 6

Continuous Assessment 1

Course Code: BIO.III.E-2
Course Name: Metabolism of Biomolecules
Date: 06 October 2020 Time: 9.00 am to 10.10 am
Mode: Multiple Choice Questions (60 MCQs for 0.5 mks each)

*All questions are Compulsory
*Each question is a multiple-choice question with four answer choices.
*Read each question carefully and choose the ONE correct answer.

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1. Which among the following are ketopentoses: a) Ribose; b) Xylulose; c) Erythrose; d) Ribulose * *

- a and c
- b and d
- c and d
- b and c

2. The dephosphorylation of Fructose 1,6 – Bisphosphate is catalyzed by Fructose 1,6 – Bisphosphatase, What catalyzes the reverse reaction? * *

- Phospho hexose isomerase
- Hexokinase
- Pentose phosphate kinase
- Phosphofructokinase

3. The action of the enzyme aldolase yields * *

- Two Aldoses
- Two Ketoses
- One Aldose and one ketose
- None of the Above

4. Substrate level phosphorylation In the tri Carboxylic acid cycle results in the addition of phosphate group to nucleoside of the which of the following base * *

- Guanine
- Adenine
- Thymine
- Uracil

5. The activity that leads to the final break of the α- 1-6 linkage in glycogen is * *

- Glucotransferase activity
- Glucomutase activity

- Glucophosphorylase activity

6. 2. The cytosolic NADH Dehydrogenase produces NADH during the oxidation of Glyceraldehyde-3-Phosphate. In a heart cell, how is the electron pair made available to the ETC. * *

- The NADH is directly transported to Complex I
- The Electron are transferred as a part of some other compound.
- The NADH transfers electrons onto FADH2
- The NADH is processed in the cytoplasm itself.

7. In Eukaryotes Two molecules of glucose would yield how many reducing agents? * *

- 4 Cytosolic NADH, 16 Mitochondrial NADH & 4 Mitochondrial FADH2
- 2 Cytosolic NADH, 8 Mitochondrial NADH & 2 Mitochondrial FADH2
- 4 Cytosolic NADH, 12 Mitochondrial NADH & 4 Mitochondrial FADH2
- 6 Cytosolic NADH, 12 Mitochondrial NADH & 4 Mitochondrial FADH2

8. In the non oxidative phase of hexose monophosphate shunt, how many molecules of Ribose -5 - Phosphate would be required to ultimately yeild 2 hexoaldoses and 1 tri aldose * *

- 4
- 3
- 2
- 5

- Matrix to Intermembrane Space
- Intermembrane Space to Matrix
- Intermembrane Space to Cytosol
- Matrix to Cytosol

10. Which of the following statements is true for Glycolysis and Gluconeogenesis? *

- Both are anabolic
- Both are catabolic
- Glycolysis is anabolic and Gluconeogenesis is catabolic
- Gluconeogenesis is anabolic and Glycolysis is catabolic

After section 1 Continue to next section

Section 2 of 6

Contd.....

Description (optional)

11. Which of the following statements are not true about **α** - Ketoglutarate. *

- **α** - Ketoglutarate can serve as a precursor to form Amino acids.
- **α** - Ketoglutarate can serve as a precursor for Gluconeogenesis.
- **α** - Ketoglutarate can be aminated to form Glutamate.
- **α** - Ketoglutarate is incapable of undergoing an oxidation reaction

12. For the formation of One ATP Molecule four protons need to pass through the ATP Synthase pump. How many ATP molecules will formed per FADH2 molecule entering the electron transport chain. * *

- 2.5 ATP
- 1.5 ATP
- 2 ATP
- 6 ATP

13. In the malate-aspartate shuttle what is sent in the reverse direction to enable the transport of * *

- Malate
- Glutamate
- Oxaloacetate
- α- Ketoglutarate

14. Which enzyme of the TCA cycle serves as one of the complexes of the Electron transport Chain? * *

- NADH Dehydrogenase
- Succinate Dehydrogenase
- FADH2 Dehydrogenase
- Succinyl Dehydrogenase

15. Which of the following is not true about Isocitrate with respect to plant seeds? * *

- Isocitrate can undergo decarboxylation to form ***α*** - Ketoglutarate
- Isocitrate can undergo lysis to form Glyoxylate and Succinate

- Isocitrate cannot be Isomerized to form Citrate

16. Thiamine pyrophosphate is used as a cofactor for the reaction of * *

- Decarboxylation of Pyruvate
- Reduction of Pyruvation
- Oxidation of Oxaloacete
- Formation of α - Ketoglutarate

17. The major source of the energy for the brain is * *

- Fatty Acids
- Amino acids
- Nucleic Acids
- Glucose

18. In the absence of Glycogen fragment, Glycogenin serves as the Glucosyl Unit Acceptor. On which residue serves as the site for glucosyl attachement? * *

- Tryptophan
- Tyrosine
- Alanine
- Cysteine

Simple precursors build up larger molecules

- ATP is not utilized
- Reducing equivalents are not formed
- It is described as diverging.

20. Which Nucleotide plays a key role in Glycogenesis? *

- Adenosine triphosphate
- Cytidine triphosphate
- Uridine triphosphate
- Thymidine triphosphate

After section 2 Continue to next section

Section 3 of 6

Contd.....

Description (optional)

21. CO (Carbon Monoxide)binds to and inhibits Complex IV of the electrontransport chain. What effect, if any, should this CO have on oxidative phosphorylation? *

- The three functional complexes will still operate
- ATP synthase will continue pumping protons to matrix
- There will be lesser number of protons pumped

22. Which of the following is true about Ribulose * *

- It is a ketohexose
- It is a C-3 epimer of Xylulose
- It is a C-3 epimer of Ribose
- It is a isomer of Erythrose

23. The following is the sum of three steps in the citric acid cycle. A + B + FAD + H 2 O → C + FADH 2 + NADH . Choose the lettered answer that corresponds to the missing "A", "B", and "C" in the equation. * *

- A) Succinate; B) NAD+; C) Oxaloacetate
- B) Fumarate; B) NAD+; C) Oxaloacetate
- C) Succinate; B) NAD+; C) Malate
- D) Fumarate; B) NAD+; C) Malate

24. Which of the following is an aromatic amino acid? * *

- Thymine
- Tyrosine
- Histidine
- Proline

25. The mobile components of the ETC are * *

- FeS Clusters

NADH Dehydrogenase

Cytochrome C Oxidase

26. Which complex of the ETC doesn't serve as a proton pump? *

NADH Dehydrogenase

FADH2 Dehydrogenase

Succinyl Dehydrogenase

Succinate Dehydrogenase

27. Cyanide is a poison that inhibits the electron transport chain by creating a strong and stable bond with Fe-Cu center in cytochrome C oxidase (complex IV). The following statements are made about the immediate consequences. a) Prevent reduction of Oxygen; b) Prevent reduction of NADH; c) Prevent Oxidation of Oxygen; d) Prevent oxidation of NADH. Which of the statements are correct? *

a and b are corect

a and c are correct

a, b and c are correct

All are incorrect

28. The Subunit of ATP Synthase that can bind ADP and Pi are *

α - Subunit

α and β Subunit

β - Subunit

All of the above

29. Which part of the ATP formation process requires the rotation of the proton channel? *

- ATP Binding
- ATP Formation
- ATP Release
- ATP and Pi Binding

30. How many subunit of the complex I of ETC encoded by mitochondrial genes? *

- 8 Subunits
- 5 Subunits
- 7 Subunits
- 6 Subunits

After section 3 Continue to next section

Section 4 of 6

Contd....

Description (optional)

31. The function of the γ Subunit of the ATP Synthase is *

- Helps in positioning both the regions (F1 and Fo)
- Binding ATP
- Formation of ATP

32. Which of the following cannot contribute towards gluconeogenesis in liver? *

- Palmitate
- Pyruvate
- Alanine
- Glycerol

33. Copper centers are found in which of the Complexes of ETC? *

- Complex I
- Complex II
- Complex III
- Complex IV

34. In the redox reaction Malate + NAD+ ----> Oxaloacetate + NADH. Which component is oxidised and which is reduced.? *

- Malate is oxidised and NAD+ is reduced
- Malate is reduced and Oxaloacetate is Oxidised
- NADH is reduced and Malate is Oxidised
- NADH and Oxaloacetate are oxidised

35. For the formation of one molecule of water at the end of the electron transport chain, a total of how many protons are pumped in the intermembrane space.? *

10

8

4

36. Open form of β Subunit of ATP Synthase------- * *

Binds ADP and Pi together and releases ATP

Binds ADP and Pi

Brings ADP and Pi in close proximity

None of the above

37. The oxaloacetate cannot move through the inner mitochondrial membrane. How is the oxaloacetate transfered back in the cytosol? * *

Amino group form Glutamine is added

Amino group from Aspartate is added

Converted to Malate

It is not transfered to the cytosol

38. What is the purpose of the Malate aspartate shuttle? * *

To trasnfer oxaloacete to matrix of Mitochondria

To transfer NAD+ to matrix of Mitochondria

To transfer NADH to matrix of Mitochondria

To transfer Oxaloacetate to cytosol

39. Which of the following statements is true with respect to Isomers and epimers * *

- Isomers are epimers are the same thing
- All isomers are epimers but all epimers are not isomers
- Isomers and epimers are completely two different conepts
- All epimers are isomers but all isomers are not epimers

40. The electron transport chain is located in * *

- Outer Mitochondrial membrane
- Inner Mitochondrial Membrane
- Intermembrane Space
- Matrix

After section 4 Continue to next section

Section 5 of 6

Contd....

Description (optional)

41. Which of the following is not a pair of epimers? * *

- Xylulose - Ribulose
- Glucose - Galactose
- Glucose - Mannose

42. The action of isomerase enzyme on Glyceraldehyde 3 phosphate will yield-------- * *

- Glycerol 3 Phosphate
- 3 Phosphoglycerate
- Di hydroxyacteone phosphate
- Di hydroxy glycerol phosphate

43. The complex of the ETC that results in the formation of metabolic water is made up of how many * *

- 13
- 40
- 10
- 4

44. The Catalytic subunit of the ATP Synthase is located in the----- * *

- Inner Mitochondrial Membrane
- Outer Mitochondrial Membrane
- Matrix
- Intermembrane Space

45. In the glyoxylate pathway the Isocitrate lyase yields------- * *

- Succinate and Fumarate

- Glyoxylate and Succinate
- Glyoxylate and Malate

46. According to the net reaction of Glycolysis, which of the following correctly lists the outcomes of the pathway? * *

- 4 ATP, 2 NADH, 2 Pyruvate
- 2 ATP, 2 NADH, 2 Pyruvate
- 2 ATP, 4 NADH, 2 Pyruvate
- 2 ATP, 2 NADH, 1 Pyruvate

47. In absence of oxygen pyruvate will be converted to------ * *

- Acetyl CoA
- Glyoxylate
- Lactate
- Glucose

48. Which of the following product is not a result of a decarboxylation reaction? * *

- Acetyl CoA
- α- Ketoglutarate
- 6 - Phosphogluconate
- Succinate

- Brain Cells
- Heart Cells
- Kidney Cells
- Liver Cells

50. The reducing equivalent in the shuttle operating in the skeletal muscle cell is ------ * *

- Dihydroxy acetone phosphate
- Glycerol 3 Phosphate
- Oxaloacetate
- Malate

After section 5 Continue to next section

Section 6 of 6

Contd.....

Description (optional)

51. Which vitamin deficiency can cause an increase in the pyruvate and lactate content? * *

- Niacin
- Pyridoxine
- Thiamine
- Ascorbic Acid

52. The TCA Cycle does not occur in * *

- Myocytes
- Hepatocytes
- Nerve cells
- Erythrocytes

53. Upon the exhaustion of Glycogen reserves after long hours of fasting which of the following pathway will be set in motion to ensure brain activity? * *

- Coversion of Oxaloacete to Glucose
- Conversion of Pyruvate to Glucose
- Conversion of Glycerol to Glucose
- All of the above could take place

54. Which of the following are major sites for glycogen storage? * *

- Adipose tissue
- Bones
- Muscle and liver
- Kidney and liver

55. The conversion of Glucose -6- Phosphate to Fructose -6- Phosphate is an example of which kind of * *

- Epimerization
- Isomerization

Phosphorylation

None of the Above

56. The complex that aids in the trasnfer of electron between two mobile components of ETC is ------- * *

Cytochrome c oxidase

Cytochrome c

Cyctochrome Bc1

Ubiquinone

57. Formation of which of the products yields NADPH? * *

Ribulose 5 phosphate

Oxaloacetate

Malate

Acetyl CoA

58. The reaction catalyzed by the enzyme Phosphoglucomutase is------ * *

3 - Phosphoglycerate to 2 - Phosphoglycerate

2 - Phosphoglycerate to 3 - Phosphoglycerate

Glucose -1- Phosphate to Glucose -6 - Phosphate

Glucose -6- Phosphate to Glucose

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60. Which among the following is not a monosacharide * *

Mannose

Galactose

Sucrose

Fructose