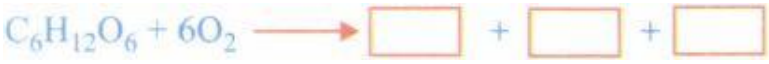
RAVI MATHS TUITION CENTRE , WHATSAPP - 8056206308

Time : 60 Mins **14 RESPIRATION OF PLANTS 1** **Marks : 240**

1. Which of the following statements regarding metabolic pathways is incorrect?
   a) Many of the steps of glycolysis can run in reverse
   b) Starch, sucrose or glycogen must be hydrolysed before it can enter the glycolysis
   c) After fats are digested, glycerol enters glycolysis by forming DHAP.
   d) After fat digestion, fatty acids can no longer participate in cellular respiration.
2. Mercury (Hg) is generally used in anaerobic respiration experiments because it does not react with _____
   a) O_2 b) CO_2 c) H_2O d) air
3. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
   Assertion: The first step in TCA cycle is the condensation of pyruvate with oxaloacetic acid and water.
   Reason: This reaction is catalysed by enzyme pyruvate synthase
   a) If both assertion and reason are true and reason is the correct explanation of assertion
   b) If both assertion and reason are true but reason is not the correct explanation of assertion
   c) If assertion is true but reason is false. d) If both assertion and reason are false
4. Match the following and choose the correct option from those given below.

	Column A		Column B
A.	Molecular oxygen	i	α-ketoqlutaric acid
B.	Electron aceptor	ii.	H drogen acceptor
C.	Pyvate dehydrogenase	iii.	Cytochrome C
D.	Decarboxylation	iv	Acetyl Co A

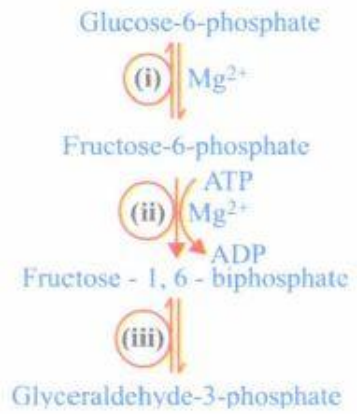
   a) A-ii, B-iii, C-iv, D-i b) A-iii, B-iv, C-ii, D-i c) A-ii, B-i, C-iii, D-iv d) A-iv, B-iii, C-i, D-ii
5. All enzymes of TCA cycle are located in the mitochondrial matrix except one which is located in inner mitochondrial membranes in eukaryotes and in cytosol in prokaryotes. This enzyme is
   a) isocitrate dehydrogenase b) ketoglutarate dehydrogenase c) succinate dehydrogenase
   d) lactate dehydrogenase
6. Complete the following biochemical equation of respiration and select the correct answer



   a) $6CO_2$ + 12Hp + Energy b) $12CO_2 + 4H_2O$ + Energy c) $12CO_2 + 6H_2O$ + Energy
   d) $6CO_2 + 6H_2O$ + Energy
7. Chemiosrnotic theory of ATP synthesis in the chloroplasts and mitochondria is based on_____

a) membrane potential b) accumulation of Na ions c) accumulation of K ions d) proton gradient

8. Study the given steps of glycolysis and identify the enzymes (i), (ii) and (iii) responsible for carrying out these steps.



a)

(i)	(ii)	(iii)
Phosphohexose isomerase	Phospho fructokinase	Aldolase

b)

(i)	(ii)	(iii)
Hexokinase	Phospho fructokinase	Aldolase

c)

(i)	(ii)	(iii)
Phosphohexose isomerase	Hexokinase	Phospho fructokinase

d)

(i)	(ii)	(iii)
Aldolase	Phospho fructokinase	Phosphohexose isomerase

9. Match column I with column II and select the correct option from the codes given below.

Column I	**Column II**
A. TCA cycle	(i) Inner mitochondrial membrane
B. F_0 - F_1 particles	(ii) Hans Krebs
C. End product of glycolysis	(iii) Oxidative decarboxylation
D. Pyruvate dehydrogenase	(iv) Pyruvic acid

a) A-(ii), B-(i), C-(iv), D-(iii) b) A-(i), B-(ii), C-(iv), D-(iii) c) A-(ii), B-(iii), C-(iv), D-(i)

d) A-(iii), B-(ii), C-(i), D-(iv)

10. Last e^- acceptor during ETS is

a) O_2 b) cyt a c) cyt a_2 d) cyt a_3

11. Which of the following options does not hold good regarding anaerobic respiration or fermentation?

a) Occurs inside the mitochondria b) Partial breakdown of glucose occurs

c) Net gain of only 2 ATP molecules d) None of these

12. In the electron transport chain during terminal oxidation, the cytochrome, which donates electrons to O_2 is

a) Cytochrome -b b) Cycto-C c) Cycto-a_3 d) Cycto-f

13. The number of ATP molecules produced by electron transport system from kreb's cycle intermediates in a single turn is

a) 11 b) 14 c) 12 d) 16

14. End product of citric acid/Krebs' cycle is_____

a) citric acid b) lactic acid c) pyruvic acid d) CO_2+H_2O

15. Apparatus to measure rate of respiration and RQ is_____

a) auxanometer b) potometer c) respirometer d) manometer

16. Identify enzyme A in the given reaction of Krebs' cycle.

$$\underset{(4C)}{OAA} + Acetyl - CoA + H_20 \xrightarrow{A} \underset{(6C)}{Citric\ acid} + CoA$$

a) Oxaloacetate synthetase b) Citrate synthase c) Aconitase d) Dehydrogenase

17. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :

Assertion: Glycolysis is also called EMP pathway

Reason: It is the only process of respiration in aerobic organisms

a) If both assertion and reason are true and reason is the correct explanation of assertion

b) If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false d) If both assertion and reason are false.

18. The respiration in germinating seeds produces energy which can be detected in the form of

a) water b) heat c) oxygen d) CO_2

19. Oxidation of one NADH and one $FADH_2$ respectively gives rise to _____ and _____ ATP molecules.

a) 3 and 2 b) 2 and 1 c) 2 and 3 d) 1 and 1

20. Fate of pyruvic acid during aerobic respiration is:

21. Which one of the following statements in incorrect?

a) In competitive inhibition, the inhibitor molecule is not chemically changed by the enzyme

b) The competitive inhibitor does not affect the rate of breakdown of the enzyme for the substrate.

c) The presence of the competitive inhibitor decreases the KM of the enzyme of the substrate

d) A competitive inhibitor reacts reversibly with the enzyme to form an enzyme -inhibitor complex.

22. At a temperature above 35^oC____

a) rate of photosynthesis will decline earlier than that of respiration

b) rate of respiration will decline earlier than that of photosynthesis c) there is no fixed pattern

d) both decline simultaneously

23. Respirometer is an instrument used to measure

a) rate of respiration b) respiratory quotient c) both of these d) none of these.

24. Which statement is wrong for Kreb's cycle?

a) There are three point in the cycle where NAD+ is reduced to NADH + H+

b) There is one point in the cycle where FAD+ is reduced to FADH2

c) During conversion of succinyl CoA to succine acid, a molecule of GTP is synthesised

d) The cycle starts with condensation of acetyl group (acetyl CoA) with pyruvic acid to yield citric acid

25. The following ie required both by the process of respirtion and photosynthesis

a) Carbohydrates b) Sunlight c) Chlorophyll d) Cytochromes

26. Which of the following describes significance of fermentation?

(i) Production of alcohol in brewing industry

(ii) Making of dough in baking industry

(iii) Curing of tea and tobacco

(iv) Production of vinegar by acetic acid bacteria

a) (i), (ii) and (iii) b) (i), (ii) and (iv) c) (ii), (iii) and (iv) d) (i), (ii), (iii) and (iv)

27. Which of the following steps of respiration is amphibolic?

a) Glycolysis b) Oxidative decarboxylation of pyruvate c) TCA cycle d) Oxidative phosphorylation

28. The germinating seeds fatty acids are degraded exclusively in the
    a) Peroxisomes b) Mitochondria c) Proplastids d) Glyoxysomes

29. Identify the enzymes 1 and 2 in the given reaction and select the correct option.

a)

1	2
Alcohol dehydrogenase	Pyruvate decarboxylasE

b)

1	2
Alcohol decarboxylase	Pyruvate dehydrogenase

c)

1	2
Pyruvate decarboxylase	Alcohol dehydrogenaseC

d)

1	2
Pyruvate dehydrogenase	Alcohol dehydrogenase

30. ATP is injected in cyanide poisoning because it is_____
    a) necessary for cellular functions b) necessary for Na^+ - K^+ pump
    c) Na^+ - K^+ pump operates at the cell membranes d) ATP breaks down cyanide

31. During oxidation of one mole of glucose, 36 ATP can be obtained by which of the following distribution?
    a) Glycolsis-2, Citric acid cycl-6, ETS-28 b) Glycolysis-2, Citric acid cycle-2, ETS-32
    c) Glycolysis-4, Citic acid cycle-2, ETS-30 d) Glycolysis-2, Citic acid cycle-4, ETS-30

32. Ethyl alcohol fermentation occurs in
    a) Lactobacillus b) muscles of humans c) Rhizopus d) all of these

33. During the process of aerobic respiration, _____(i)_____ gets oxidised and its electrons get transferred to the electron transport chain while in photosynthesis ___(ii)___ gets oxidised to transfer molecules to the electron transport chain.
    a) (i)-glucose; (ii)-xanthophyll b) (i)-carbon dioxide, (ii) - xanthophyll c) (i)-carbon dioxide, (ii)-chlorophyll-a
    d) (i)-glucose, (ii)-chlorophyll-a

34. At the end of glycolysis, X is the net energy gain from one molecule of glucose via Y, but there is also energy stored in the form of Z. Identify X, Y and Z.

a)

X	**Y**	**Z**
1ATP	Oxidative phosphorylation	$NADH + H^+$

b)

X	**Y**	**Z**
2 ATPs	Oxidative phosphorylation	$NADH + H^+$

c)

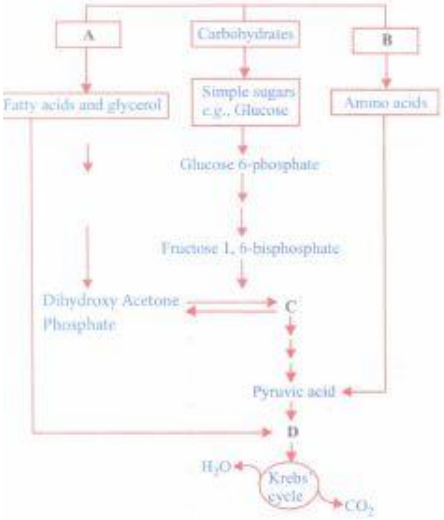
X	**Y**	**Z**
1 ATP	Substrate level phosphorylation	$FADH_2$

d)

X	**Y**	**Z**
2 ATPs	Substrate level phosphorylation	$NADH + H^+$

35. Pyuvate dehydrogenase complex is used ion converting-
    a) Pyurvate to glucose b) Glouse to pyruvate c) Pyruvic acid to lactic acid d) Pyruvate to acetyl Co-A

36. Refer to the given figure and select the correct option for A, B, C and D.



a)

A	B	C	D
Fats	Proteins	3-PGAL	Acetyl CoA

b)

A	B	C	D
Fats	Proteins	3-PGAL	CO_2

c)

A	B	C	D
Proteins	Fats	Acetyl CoA	PEP

d)

A	B	C	D
Proteins	Fats	PEP	Acetyl CoA

37. Select the correct statements.

(i) Between temperature range 0 - 25°C, rate of respiration doubles for every 10° Crise in temperature

(ii) Cytochrornes are iron-porphyrin compounds.

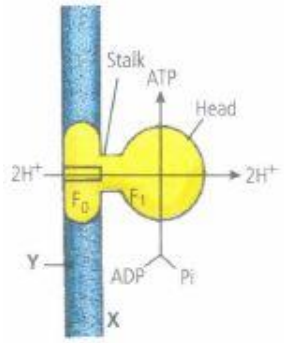
(iii) Respiratory rate of wounded or injured plant parts generally decreases

a) (i) and (ii) b) (ii) and (iii) c) (i) and (iii) d) (i), (ii) and (iii)

38. The number of substrate level phosphorylations in one turn of citric acid cycle is____

a) 2 b) 3 c) 0 d) 1

39. Study the given figure and select the incorrect option regarding this.



a)

The figure represents chemiosmotic ATP synthesis by oxysomes where X is the mitochondrial matrix and Y is the inner mitochondrial membrane

b) Enzyme required for ATP synthesis is ATP synthase, considered to be the complex-V of ETS.

c)

The figure represents oxidative phosphorylation which is the synthesis of energy rich ATP molecules with the help of energy liberated during oxidation of reduced co-enzymes (NADH, FADH2) produced in respiration.

d)

ATP synthase becomes active only when there is a proton gradient having higher concentration of protons (W) on the inner side (F1 side) as compared to the outer side (Fa side).

40. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
Assertion: This conversion of 1, 3-bishosphoglycerate (BPGA) to s-phosphoglyceric acid (PGA) is an energy yielding step.
Reason: This energy is trapped by the formation of ATP.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

41. Which of the following is link between carbohydrate ansd fat metabolism?
a) CO_2 b) Acetyl Co-A c) Pyruvic acid d) Citric acid

42. RQ is___
a) C/N b) N/C c) CO_2/O_2 d) O_2/CO_2

43. Number of total ATP generated through TCA cycle per pyruvic acid molecule is
a) 10 b) 12 c) 14 d) 24

44. First step of CO_2 liberation during aerobic respiration is
a) PEP ⟶ Pyruvate b) Pyruvate ⟶ Acetyl CoA c) Isocitrate ⟶ Oxalosuccinate
d) Succinyl CoA ⟶ Succinate

45. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
Assertion: Oxidation of one molecule of NADH gives rise to 3 molecules of ATP and that of one molecule of $FADH_2$ produces 2 molecules of ATP.
Reason: The number of ATP molecules synthesised depends on the nature of the electron donor.
a) If both assertion and reason are true and reason is the correct explanation of assertion
b) If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false d) If both assertion and reason are false

46. The chemiosmotic coupling hypothesis of oxidative phosphorylation proposes that adenosine triphosphate (ATP) is formed because_____
a) high energy bonds are formed in mitochondrial proteins
b) ADP is purnped out of the matrix into the intermembrane space
c) a proton gradient forms across the inner membrane
d)
there is a change in the perureability of the inner mitochondrial membrane toward adenosine diphosphate (ADP)'.

47. The balance sheet for ATP production in glycolysis has been given below. Select the option which correctly fills up the blanks for P,0, Rand S. ['X' stands for 'nil'].

	Steps	**ATP Utilisation**	**ATP Production**
1.	Glucose⟶Glucose-6-phosphate	**P**	X
2.	Fructose-6-phosphate⟶Fructose-1, 6-bisphosphate	1	**Q**
3.	1, 3-bisphosphoglyceric acid ⟶3-Phosphoglyceric acid	X	**R**
4.	2-Phosphoenol pyruvic acid ⟶Pyruvic acid	**S**	2

a)

P	**Q**	**R**	**S**
1	X	X	2

b)

P	**Q**	**R**	**S**
1	X	2	X

c)

P	**Q**	**R**	**S**
2	1	X	1

d)

P	**Q**	**R**	**S**
X	1	2	X

48. EMP can produce a total of____

a) 6 ATP b) 8 ATP c) 24 ATP d) 38 ATP

49. How many ATP will be produced during the production of 1 molecule of Accetyl Co-A from 1 molecule of pyruvic acid?
    a) 3 ATP b) 5 ATP c) 8 ATP d) 38 ATP

50. Oxidative phosphorylation is
    a) Formation of ATP energy released from electrons removed during substrate oxidation
    b) Formation of ATP by transfer of phosphate group from a substrate to ADP
    c) Oxidation of phosphate group in ATP d) Addition of phosphate group to ATP

51. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as:
    Assertion: Complex II and complex III of ETS are NADH dehydrogenase and cytochrome oxidase complex respectively.
    Reason: Cytochrome c acts as a mobile carrier for transfer of electrons between complex II and III
    a) If both assertion and reason are true and reason is the correct explanation of assertion
    b) If both assertion and reason are true but reason is not the correct explanation of assertion
    c) If assertion is true but reason is false d) If both assertion and reason are false

52. If volume of CO_2 liberated during respiration is more than the volume of O_2 used, then the respiratory substrate will be:
    a) carbohydrate b) fat c) protein d) organic acid.

53. Which of the following biomolecules is common to respiration mediated breakdown?
    a) Acetyl CoA b) Glucose 6-phosphate c) Fructose 1,6-biphosphate d) Pyruvic acid

54. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice as :
    Assertion: Respiration is the breaking of the C - C bonds of complex compounds through oxidation within the cells and release of large amount of energy.
    Reason: The compounds that are oxidised during respiration are called respiratory substrates
    a) If both assertion and reason are true and reason is the correct explanation of assertion
    b) If both assertion and reason are true but reason is not the correct explanation of assertion
    c) If assertion is true but reason is false d) If both assertion and reason are false.

55. Number of oxygen atoms required for aerobic oxidation of one pyruvate-
    a) 5 b) 8 c) 10 d) 12

56. Select the correct combination of the respiratory substrates and their respective RQs.

a)

Organic acids	Fats	Succulents
1.3	0.7	Zero

b)

Organic acids	Fats	Succulents
Infinity	0.7	Zero

c)

Organic acids	Fats	Succulents
Zero	1.3	0.7

d)

Organic acids	Fats	Succulents
Zero	0.7	1.3

57. During anaerobic digestion of organic waste, such as in producing biogas, which one of the following is left undegraded?
    a) Cellulose b) Lipids c) Lignin d) Hemi-cellulose

58. In Krebs' cycle, OAA accepts acetyl CoA to form
    a) citric acid b) oxalosuccinate c) fumarate d) succinyl CoA

59. Oxidative phosphorylation involves simultaneous oxidation and phosphorylation to finally form _____ .

a) pyruvate b) NADP c) DPN d) ATP

60. As per chemiosmotic coupling hypothesis, in mitochondria, protons accumulate in the
a) outer membrane b) inner membrane c) intermembrane space d) matrix