1. For gaseous exchange plants have -
(a) Stomata (b) Lenticels (c) Porin (d) a and b

2. During glycolysis, for each mole of glucose oxidized to pyruvate -
(a) 6 moles of ATP are produced
(b) 2 moles of NAD^+ are produced
(c) 2 moles of ATP are used, and 4 moles of ATP are produced
(d) No ATP is produced

3. During the energy-priming portion of glycolysis, the phosphates from ATP molecules are -
(a) Added to first and 6^{th} carbon
(b) Added to 1^{st} and 4^{th} carbon
(c) Wasted, as an energy investment
(d) Used to make lactate

4. Fermentation always produces -
(a) AMP (b) NAD^+ (c) Pi (d) DNA

5. Many species derives their energy from fermentation. The function of fermentation is to -
(a) Reduce NAD^+
(b) Oxidize CO_2
(c) Oxidize NADH + H^+, ensuring a continued supply of ATP
(d) Production of acetyl CoA

6. If O_2 is not present, yeast cells break down glucose to -
(a) $CO_2 + H_2O$ (b) CO_2 + Lactic acid
(c) CO_2 + Pyruvic acid (d) C_2H_5OH and CO_2

7. Which one is false?
(a) Less than 7% of energy in glucose is released during lactic or alcoholic fermentation
(b) Fermentation is observed in all cells
(c) O_2 is an essential requirement for aerobic respiration but it enters the respiratory process at the end
(d) In aerobic respiration glucose is broken down into $CO_2 + H_2O$

8. In Kreb's cycle, how many oxidation (dehydrogenation) occur?
(a) 4 (b) 6 (c) 2 (d) 1

9. In Kreb's cycle-
(a) Acetyl coenzyme A undergoes 4 oxidations and 2 decarboxylations
(b) Pyruvic acid undergoes 4 oxidations and 2 decarboxylations
(c) TCA undergoes 4 oxidations and 4 decarboxylations
(d) OAA undergoes 4 oxidations and 2 decarboxylations.

10. Correct sequence of events in Kreb's cycle is -
(a) Acetyl CoA → Citrate → Pyruvate → α-ketoglutarate → Succinate → Malate → Fumarate → OAA
(b) Acetyl CoA → Citric acid → α-ketoglutaric acid → Succinic acid → Fumaric acid → Malic acid → OAA
(c) Acetyl CoA → Citric acid → Malic acid → α-ketoglutaric acid → Succinic acid → OAA
(d) All are wrong

11. The first 5-C dicarboxylic in Kreb's cycle which is used in nitrogen metabolism is -
(a) OAA (b) Citric acid
(c) α-ketoglutaric acid (d) Acetyl Coenzyme A

12. Inside an active mitochondrion, most electrons follow which pathway?
(a) Glycolysis → NADH → Oxidative Phosphorylation → ATP → O_2
(b) Krebs' cycle → $FADH_2$ → ETS → ATP
(c) ETS → Krebs' cycle → ATP → O_2
(d) Krebs' cycle → NADH + H^+ → Electron transport chain → O_2

13. At the end of the Krebs cycle, but before the electron transport chain, the oxidation of glucose has produced a net gain of -
(a) $3CO_2$, 5 $NADH_2$, 1$FADH_2$, 2 ATP
(b) $6CO_2$, 10 $NADH_2$, 2 $FADH_2$, 4 ATP
(c) $6CO_2$, 10 $NADH_2$, 2 $FADH_2$, 38 ATP
(d) None of the above is correct

14. Dhich of the following sequences correctly indicates the potential ATP yield of the indicated molecules from greatest ATP yield to least ATP yield?
(a) Pyruvate, ethanol, glucose, acetyl CoA
(b) Glucose, Pyruvate, acetyl CoA, NADH + H^+
(c) Glucose, $FADH_2$, Acetyl CoA, Pyruvate
(d) Glucose, $FADH_2$, $NADH_2$, pyruvate

15. Which one is correct?
(a) During the fermentation, 2 molecules of ATP per molecule of glucose is the net gain
(b) Oxidative phosphorylation produces the most ATP in the cell
(c) During TCA cycle oxidative steps are coupled to the reductions of e^- carriers
(d) All

16. Most ATP in our bodies is made by-
(a) Glycolysis (b) TCA cycle
(c) Burning fat (d) ATP synthase

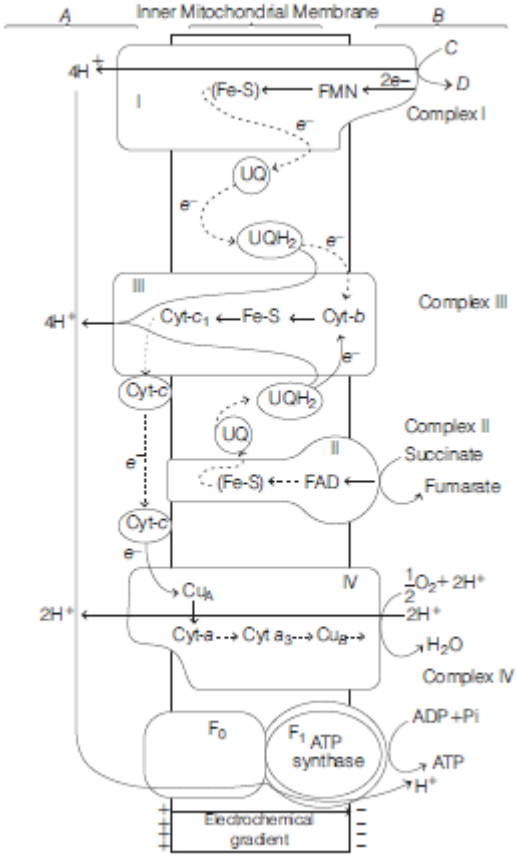
17. Which of the following conversions represents a reduction reaction?
(a) Pyruvate → Acetyl CoA
(b) NADH + H^+ → NAD^+ + 2H
(c) 3 PGAld → Pyruvate
(d) Acetyldehyde → Ethanol

18. During which stage in the complete oxidation of glucose are the greatest number of ATP molecules formed from ADP?
(a) Conversion of pyruvic acid to acetyl Co-A
(b) Electron transport chain
(c) Glycolysis
(d) Krebs' cycle

19. The main purpose of electron transport chain is to
(a) release and utilise energy stored in NADH+ H^+ and $FADH_2$
(b) use the intermediate from TCA cycle
(c) breakdown pyruvic acid
(d) All of the above

20. The *e*- carrier molecules and cytochrome
(a) are reduced as they pass electrons on to next molecule
(b) transfer electrons between the electron complexes
(c) shuttle protons to ATP synthase
(d) are found in outer mitochondrial membrane

21. Identify *A, B, C* and *D* in the given figure of electron transport chain.



	A	B	C	D
(a)	Matrix	Outer chamber	$FMNH_2$	$NADH_2$
(b)	Inter-membrane space	Matrix	$NADH + H^+$	NAD^+
(c)	Inter-membrane space	Cristae	NAD^+	$NADH + H^+$
(d)	Cristae	Outer chamber	$NADH + H^+$	NAD^+

22. The initial step in the biosynthesis of ATP by chemiosmosis in the mitochondria is the
(a) pumping of protons in the outer chamber
(b) pumping of electrons in the matrix
(c) action of ATP synthase
(d) formation of metabolic water

23. Which of the following shows correct order of flow of electrons in ETC ?
(a) Fe-S→ NADH→ Co-Q→ Cyt-*b*→ Fe-S→ Cyt-*c* → Cyt-*a*3→ O2→ Cyt-*b*
(b) NADH→ FMN→ Fe-S→ Co-Q→ Cyt-*b*→ Fe-S→ Cyt-*c*1→ Cyt-*e*→ Cyt-*a*→ Cyt-*a*3→ O2
(c) NADH→ Cyt-*c*1→ Cyt-*c*→ Cyt-*a*→ Cyt-*a*3→ O2→ FMN→ Fe-S→ Co-Q→ Cyt-*b*→ Fe-S
(d) Cyt-*c*1→ Cyt-*c*→ Cyt-*a*→ Cyt-*a*3→ NADH→ FMN→ Fe-S→ Co-Q→ Cyt-*b*→ Fe-S→ O2

24. In the electron transport system present in the inner mitochondrial membrane, complex-I and IV are, respectively
(a) NADH dehydrogenase and $FADH_2$
(b) $NADH_2$ and NADH dehydrogenase
(c) NADH dehydrogenase and cytochrome oxidase complex
(d) NADH dehydrogenase and ATP synthetase

25. Which one of following is complex-V of the ETS of inner mitochondrial membrane?
(a) NADH dehydrogenase (b) Cytochrome oxidase
(c) Ubiquinone (d) ATP synthase

26. In electron transport system, which of the following acts as a final electron acceptor?
(a) Oxygen (b) Hydrogen
(c) Calcium (d) Ubiquinone

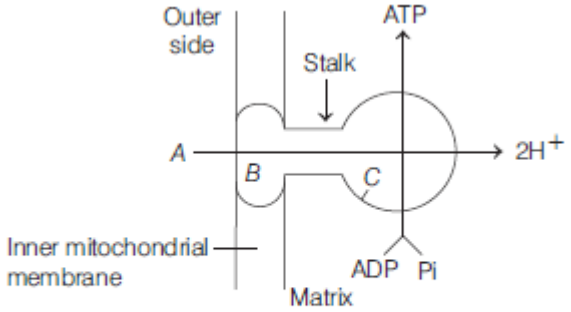
27. Which of the following processes takes place in mitochondria?

(a) Photolysis (b) Photophosphorylation
(c) Carboxylation (d) Oxidative phosphorylation

28. Oxidative phosphorylation is ***NEET 2016***
(a) formation of ATP by transfer of phosphate group from a substrate to ADP
(b) oxidation of phosphate group in ATP
(c) addition of phosphate to ATP
(d) formation of ATP by energy released from electron removed during substrate oxidation

29. In which part of mitochondria does ATP synthesis occur?
(a) F_1 (b) F_0
(c) Cristae (d) Inner membrane of mitochondria

30. Given below is the diagrammatic presentation of ATP synthesis in mitochondria. Identify *A*-*C* and choose the correct option accordingly.



(a) $A-H^+, B-F_1, C-F_0$ (b) $A-3H^+, B-F_0, C-F_1$
(c) $A-2H^+, B-F_0, C-F_1$ (d) $A-5H^+, B-F_1, C-F_0$

1. (d)

2. (c)

3. (a)

4. (b)

5. (c)

6. (d)

7. (b)

8. (a)

9. (a)

10. (b)

11. (c)

12. (d)

13. (b)

14. (b)

15. (d)

16. (d)

17. (d)

18. (*b*) The number of glucose molecules produced in each reaction involved in complete glucose oxidation are

ETC produces - 34 ATP
Glycolysis produces - 2 ATP
Krebs' cycle produces - 2 ATP
Pyruvic acid to acetyl Co-A conversion produces no ATP
Thus, the highest number of ATP molecules are obtained through ETC.

19. (*a*) The main purpose of ETC (Electron Transport Chain) is to release and utilise the energy stored in NADH+ H+ and FADH2. This is accomplished when these are oxidised through the electron transport system and the electrons are passed on to O2, resulting in the formation of H O 2 .

20. (a)
21. (b)
22. (a)
23. (b)
24. (c)
25. (d)
26. (a)
27. (d)

28. (a)
29. (a)
30. (c)