1. Electron transport system (ETS) is located in mitochondrial.
(a) Inner membrane (b) Outer membrane
(c) Inter membrane space (d) Matrix

2. During electron transport system (ETS), electron transport proceeds from carriers that have ___ redoxpotential to those having ___ redox potential. This electro n transport down to the energy gradient leads to the formation of ATP from ADP and Pi, which is referred to as _____
(a) Low, high, oxidative decarboxylation
(b) High, low, oxidative phosphorylation
(c) Low, high, oxidative phosphorlylation
(d) High, low, oxidative decarboxylation

3. Conversion of a-ketoglutaric acid into succinic acid is a step of -
(a) EMP pathway (b) TCA cycle
(c) HMP pathway (d) ED pathway

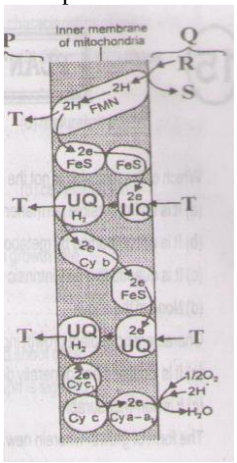
4. Kreb's cycle is also called TCA (Tri Carboxylic acid Cycle) or citric acid cycle (Organic acid cycle). It is also called metabolic sink as it is-
(a) Common pathway for carbohydrates, fats and proteins (amino acids)
(b) Common pathway for carbohydrates and fats only
(c) Common pathway for carbohydrates and organic acids only
(d) None of the above

5. Krebs's cycle is completed with the formation of-
(a) Citric acid (b) OAA
(c) Succinic acid (d) Malic acid

6. Which one of the following statements correctly describes relationship between the Kreb's cycle and electron transport pathway?
(a) The Kreb's cycle releases H^+ used by electron transport
(b) The electron transport pathway obtains electron from the CO_2 produced by the Kreb's cycle
(c) The Kreb's cycle and electron transport pathway, both produce ATP
(d) NADH + H^+ produced by Krebs' cycle is used to make ATP by electron transport

7. The main purpose of electron transport chain is to-
(a) Cycle NADH + H^+ back to NAD^+
(b) Use the intermediates from TCA cycle
(d) Breakdown pyruvate
(d) All

8. The adjoining diagram refers to mitochondrial electron transport chain. Identify the P, Q, R, S, T



(a) P - Matrix; Q - Outer membrane; R - $FMNH_2$; S - $NADH_2$; T - 2H

(b) P - Outer chamber; Q - Matrix; R - NADH + H^+; S - NAD^+; T - $2H^+$
(c) P - Outer membrane; Q - Cristae; R - NAD^+; S - NADH + H^+; T - H_2
(d) P - Cristae; Q - Outer chamber; R - NADH + H^+; S - NAD^+; T - $2H^+$

9. Enzymes of oxidative phosphorylation are found in

(a) Endoplasmic reticulum (b) Chloroplast
(c) Mitochondria (d) Golgi bodies

10. Which complex is formed by Cyt. a and Cyt.a_3

(a) Complex–I (b) Complex–II (c) Complex–III (d) Complex–IV

11. The enzymes for electron transport system are located in the

(a) Plastids (b) Endoplasmic reticulum
(c) Ribosomes (d) Mitochondria

12. At high temperature in aerobic respiration, why the R.Q. value becomes more than one

(a) Requirement of O_2 increases but due to less availability of O_2 partial replacement of aerobic respiration takes place by anaerobic respiration
(b) O_2 requirement decreases hence due to availablity of more O_2 than required
(c) By formation of more organic acids which enter respiration
(d) None of the above

13. R.Q. of germinating seed of castor is

(a) 1 (b) > 1 (c) < 1 (d) 0

14. Which of the following is the phosphorylating unit

(a) Oxysome (b) Mesosome (c) Peroxisome (d) Mitochondria

15. FAD is electron acceptor during oxidation of which of the following

(a) α - Ketoglutarate $\rightarrow$ succinyl CoA (b) Succinic acid $\rightarrow$ Fumaric acid
(c) Succinyl CoA $\rightarrow$ succinic acid (d) Fumaric acid $\rightarrow$ malic acid

16. Food is converted to energy in

(a) Chloroplast (b) Nucleus
(c) Mitochondria (d) None of the above

17. The respiratory quotient during cellular respiration would depend on

(a) The nature of enzymes involved (b) The nature of the substrate
(c) The amount of carbondioxide released (d) The amount of oxygen utilised

18. R.Q (respiratory quotient) is defined as

(a) Volume of CO_2 evolved = volume of O_2 consumed
(b) $\frac{\text{Volume of } O_2 \text{ consumed}}{\text{Volume of } CO_2 \text{ evolved}}$

(c) $\frac{\text{Volume of } CO_2 \text{ evolved}}{\text{Volume of } O_2 \text{ consumed}}$

(d) $\frac{\text{Volume of } O_2 \text{ evolved}}{\text{Volume of } CO_2 \text{ consumed}}$

19. Choose the correct option -

$$RQ = \frac{Volume of\ CO_2\ evolved}{Volume of\ O_2\ consumed}$$

(a)

(b) RQ depends on the types of respiratory material

(c) Living organisms use respiratory substances (often more than one); pure lipid or fats are never used

(d) All

20. The Respiratory Quotient (RQ) or respiratory ratio is

(a) $RQ = \frac{\text{Volume of } O_2 \text{ evolved}}{\text{Volume of } CO_2 \text{ consumed}}$

(b) $RQ = \frac{\text{Volume of } O_2 \text{ consumed}}{\text{Volume of } CO_2 \text{ evolved}}$

(c) $RQ = \frac{\text{Volume of } CO_2 \text{ consumed}}{\text{Volume of } O_2 \text{ evolved}}$

(d) $RQ = \frac{\text{Volume of } CO_2 \text{ evolved}}{\text{Volume of } O_2 \text{ consumed}}$

21. The respiratory quotient during cellular respiration would depend on the

(a) nature of enzymes involved

(b) nature of the substrate

(c) amount of carbon dioxide released

(d) amount of oxygen utilised

22. The Respiratory Quotient (RQ) of some of the compounds are 4, 1 and 0.7. These compounds are identified respectively as

(a) malic acid, palmitic acid and tripalmitin

(b) oxalic acid, carbohydrate and tripalmitin

(c) tripalmitin, malic acid and carbohydrate

(d) palmitic acid, carbohydrate and oxalic acid

23. In succulent plants like *Opuntia*, the RQ value will be

(a) less than one (b) more than one

(c) infinite (d) zero

24. What is the RQ of glucose? ***JIPMER 2018***

(a) One (b) Less than one

(c) More than one (d) Infinite

25. RQ value of 0.9 may be expected for the complete oxidation of which one of the following biomolecule?

(a) Glucose (b) Malic acid

(c) Proteins (d) Tartaric acid

26. If RQ is less than 1.0 in a respiratory metabolism, t would mean that

(a) carbohydrates are used as respiratory substrate

(b) organic acids are used as respiratory substrate

(c) the oxidation of the respiratory substrate consumed more oxygen than the amount of CO_2 released

(d) the oxidation of the respiratory substrate consumed less oxygen than the amount of CO_2 released

27. Refer the given equation.

$$2(C_{51}H_{98}O_6) + 145\ O_2 \rightarrow 102\ CO_2 + 98\ H_2O + \text{Energy}$$

The respiratory quotient in this case is

(a) 1 (b) 0.7

(c) 1.45 (d) 1.62

28. Maximum amount of energyper molecule is liberated on oxidation of

(a) fats (b) proteins
(c) starch (d) vitamins

29. More carbon dioxide is evolved than the volume of oxygen consumed when the respiratory substrate is
(a) fat (b) sucrose
(c) glucose (d) organic acid

30. The Respiratory Quotient (RQ) of a germinating castor seed is
(a) equal to one (b) greater than one
(c) less than one (d) equal to zero

1. (a)

2. (c)

3. (b)

4. (a)

5. (b)

6. (d)

7. (a)

8. (b)

9. (c)
10. (d)
11. (d)
12. (a)
13. (c)
14. (a)
15. (b)
16. (c)
17. (b)
18. (c)
19. (d)

20. (d)
21. (b)
22. (b)
23. *(d)* In succulent plants like *Opuntia*, carbohydrates are incompletely oxidised to organic acid in dark without he evolution of CO_2. Hence, the value of RQ remains zero.

24. (a)
25. (c)
26. *(c)* Respiratory quotient is the ratio of volume of CO_2 evolved to the volume of O_2 consumed. Thus, if RQ is less than 1.0 in respiratory metabolism, means that respiratory substrates consume more oxygen than the amount of CO_2 released.

27. (b)
28. (a)
29. *(d)* Organic acid evolves more carbon dioxide than volume of oxygen it consumes when broken down as respiratory substrate under aerobic conditions. Thus, its RQ is more than unity.

30. (*c*) The Respiratory Quotient (RQ) of a germinating castor seed is less than one. This can be explained as castor seeds are rich in fats (oil) and respiratory quotient of fats is less than one (mostly 0.7). During germination of seed aerobic respiration occurs and oxygen is consumed. Since, breakdown of fat required more oxygen, their RQ is less than one.