Q-1 - 23761847

in the process of repiration in plants 180 gms of sugar plus 192 gms of oxygen produce

(A) 132 g of CO_2, 54, g of water and 343 Col. Energy

(B) 264 g of CO_2, 108 g of water and 686 Cal. Of energy

(C) 528 g of CO_2, 216 g for water and 1372 Cal. Of energy

(D) Large amount of CO_2, no water and no energy.

CORRECT ANSWER: B

SOLUTION:

Molecular wt. of glucose is 180, 6 molecules of oxygen are 192, 6 molecules of CO_2 are 264 while 6 molecules of water are 108. Calories with capital C(Cal) is kcal.

Watch Video Solution On Doubtnut App

Q-2 - 23761855

R.Q. is less than one when the respiratory substrate is

(A) Sucrose

(B) Fat

(C) Glucose

(D) Less than one

CORRECT ANSWER: B

Watch Video Solution On Doubtnut App

Q-3 - 23761873

Both ATP and Mg^2 are involved in the activity of

(A) Pyruvic Kinase

(B) Glucokinase

(C) Phosphogluco isomerase

(D) PGA dehydrogenase

CORRECT ANSWER: B

Watch Video Solution On Doubtnut App

Q-4 - 23761890

When one glucose molecule is completely oxidised, it changes

(A) 36 ADP molecules into 36 ATP molecules

(B) 38 ADP molecules into 38 ATP molecules

(C) 30 ADP molecules into 30 ATP molecules

(D) 32 ADP molecules into 32 ATP molecules.

CORRECT ANSWER: B

Watch Video Solution On Doubtnut App

Q-5 - 23761907

End product of citric acid/Krebs' cycle is

(A) Citric acid

(B) Lactic acid

(C) Pyruvic acid

(D) $CO_2 + H_2O$

CORRECT ANSWER: D

Watch Video Solution On Doubtnut App

Q-6 - 23761920

NAD of Krebs cycle functions as

(A) Acceptor of hydrogen ion and electrons

(B) Oxygen acceptor

(C) Oxygen donor

(D) Donor of phosphate ions.

CORRECT ANSWER: A

Watch Video Solution On Doubtnut App

Q-7 - 23761936

Which component of ETC is not a protein ?

(A) Cytochrome

(B) Ubiquinone

(C) Cytochrome oxidase

(D) All the above

CORRECT ANSWER: B

Watch Video Solution On Doubtnut App

Q-8 - 23761987

FAD participates in Krebs' cycle as electron acceptor during conversion of

(A)

$\alpha -$ Ketoglutarate

$\rightarrow$ Succinyl CoA

(B)

Succinic acid$\rightarrow$Furmaric acid

(C)

$\text{Succinyl CoA} \rightarrow \text{Succinic acid}$

(D)

$\text{Fumaric acid} \rightarrow \text{Malic acid.}$

CORRECT ANSWER: B

Watch Video Solution On Doubtnut App

Q-9 - 23761992

Which theory explains ATP synthesis in chloroplasts and mitochondira ?

(A) Lipman and Lohmann theory

(B) Lock and key theory of Fischer

(C) Induced fit theory of Fischer

(D) Chemi-osmotic theory of Mithell.

CORRECT ANSWER: D

Watch Video Solution On Doubtnut App

Q-10 - 23762001

Differences between photophosphorylation (PP) and oxidative phosphorylation (OP) is

(A) In PP, synthesis is of ATP while in OP it is of ADP

(B) In PP, oxygen is evolved while in OP oxygen is taken up

(C) Both cannot take place in light

(D) PP can take place in green leaves while OP cannot occur in green leaves.

CORRECT ANSWER: B

Watch Video Solution On Doubtnut App

Q-11 - 23762041

Energy released in aerobic respiration is higher than the one available from anaerobic respiration by

(A) 8 times

(B) 18 times

(C) 28 times

(D) 36 times.

CORRECT ANSWER: B

Watch Video Solution On Doubtnut App

Q-12 - 23762055

Bond between first phosphate and adenosine in ATP is

(A) Phosphoester bond

(B) Nitrophosphate bond

(C) Phosphoanhydride bond

(D) Adenophosphate bond.

CORRECT ANSWER: A

Watch Video Solution On Doubtnut App

Q-13 - 23762070

Select the correct match for the following (a) Net ATP produced in glycolysis (b) Positive Bendedict's test (c) Genes unable to express in presence of their allelas (d) A character controlled by many genes.

(A) 36, glucose, recessive, polygenic

(B) 8, glucose, recessive, polygenic

(C) 32, sucrose, recessive, polygenic

(D) 8, fructose, dominant, polygenic.

CORRECT ANSWER: A

Watch Video Solution On Doubtnut App

Q-14 - 23762101

An enzyme absent in mitochondrial ETS is

(A) FeS protease

(B) Glucose 6-phosphate dehydrogenase

(C) NADH dehydrogenase

(D) Cytochrome c-oxidase.

CORRECT ANSWER: B

Watch Video Solution On Doubtnut App

Q-15 - 23762107

Number of oxygen molecules required for glycolytic breakdown of one glucose molecule is

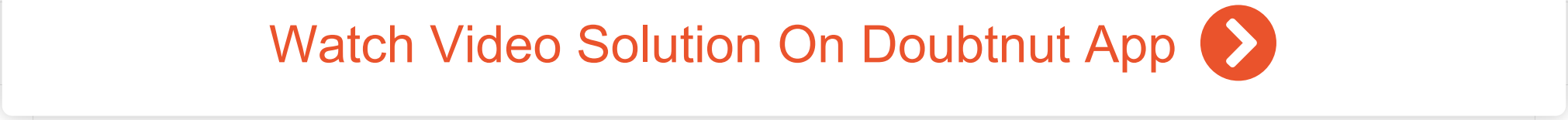
(A) 38

(B) 36

(C) 2

(D) Zero

CORRECT ANSWER: D



Q-16 - 23762120

Which of the following is the first step of glycolysis ?

(A) Conversion of glucose into fructose

(B) Dehydrogenation of glucose

(C) Breakdown of glucose

(D) Phosphorylation of glucose.

CORRECT ANSWER: D

Watch Video Solution On Doubtnut App

Q-17 - 23762150

Which of the following statements is/are not true

A) One ATP molecule yields 32 kJ of energy

B. Pentose Phosphate pathway was discovered by Dickens

C. When tripalmitin is used as a substrate, the R.Q. is 0.7

D. energy released by one molecule of glucose on complete oxidation corresponds to 1292 kJA

(A) a, b and d

(B) a and b

(C) c and d

(D) a, c and d

CORRECT ANSWER: B

Watch Video Solution On Doubtnut App

Q-18 - 23762324

Identify correct pair of statements

(i) Attraction between two molecules of water present in oxylen channel is adhesion

(ii) Number of O_2 molecules absorbed is more than number of CO_2 molecules released when triolein is respiratory substrate

(iii) Bacillus mycodies is nitrifying bacteria

(iv) Continuous system of cell walls and intercullular spaces in

plant tissues is called apoplast

(A) ii and iii

(B) iii and iv

(C) ii and iv

(D) I and iv.

CORRECT ANSWER: C

Q-19 - 23762331

Out of 38 molecules of ATP produced after aerobic respiration of glucose, the break up in ATP production glycolysis (P), pyruvic acid to acetyl CoA formation (Q) and Krebs cycle (R) is

(A) P=2, Q=6, R=30

(B) P=8, Q=6, R=24

(C) P=8, Q=10, R=20

(D) P=2, Q=12, R=24.

CORRECT ANSWER: B

Q-20 - 10761373

Which of the following glucose transporters insulin-dependent?

(A) GLUT IV

(B) GLUT I

(C) GLUT II

(D) GLUT III

CORRECT ANSWER: A

SOLUTION:

GLUT stands for glucose transport protein channel.

There are different types of GLUT channels GLUT IV is

insulin dependent glucose transporters channels.

Q-21 - 19761376

I (1) It takes as long as one swimmer moves from one place to another in accordance with the stream of the river.Its twice the time it takes to come back. If the speed of the stream is 2 km / hour then the constant waterWhat would be the speed of swimmers?

Q-22 - 34100299

The energy releasing process in which the substrate is oxidised

without an external acceptor is called or Lactic acid converted into alcohol in process called

(A) glycolysis

(B) fermentation

(C) aerobic respiration

(D) photorespiration

CORRECT ANSWER: B

SOLUTION:

Fermentation takes place in the lack of oxygen (when the electron transport chain is unusable) and becomes the cell's primary means of ATP (energy) production. It turns NADH and pyruvate in the glycolysis into NAD^+ and various small molecules depending on the type of fermentation . In the presence of O_2 , NADH and

pyruvate are used to generate ATP in respiration. It is called oxidative respriation.

Watch Video Solution On Doubtnut App

Q-23 - 34100302

the chemiosmotic coupling hypothesis of oxidative phosporylaion propass that adenosine triphoshate (ATP) is formed becouse

(A) high energy bonds are formed in mitochondrial proteins

(B) ADP is pumped out of the matrix into the intermembrane space

(C) a proton gradient forms across the inner membrane

(D) there is a change in the permeability of the inner mitochondrial membrane toward Adenosine Diphosphate (ADP)

CORRECT ANSWER: C

SOLUTION:

The production of ATP with the help of energy liberated during oxidation of reduced coenzymes and terminal oxidation is called oxidative phosphorylation . Peter Mitchell (1961) gave a hypothesis known as chemiosmotic hypothesis for ATP synthesis .According to this when electrons flow from dual proton, electron carrier to a non-hydrogen carrier the H^+ are released and expelled into the intermembrane space and thus creates a proton gradient with higher concentration of H^+ in the inter membranous space than matrix.

Due to the proton motive force the portons flow back and energy liberated during this back flow of protons activate ATPase present in F_1 head to synthesize ATP.

Watch Video Solution On Doubtnut App

Q-24 - 34100305

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) lactate dehydrogenase

(B) isocitrate dehydrogenase

(C) malate dehydrogenase

(D) succinate dehydrogenase

CORRECT ANSWER: D

SOLUTION:

Succinate dehyrogenase enzyme is present on inner membrane of mitochondria and catalyses the oxidation

of succinate to fumarate

Watch Video Solution On Doubtnut App

Q-25 - 34100307

During which stage in the complete oxidation of glucose are the greatest number of ATP molecules formed from ADP

Or

Largest amount of phosphate bond energy is produced in the process of respiration during

(A) glycolysis

(B) Krebs' cycle

(C) conversion of pyruvic acid to acetyl Co-A

(D) electron transport chain

CORRECT ANSWER: D

SOLUTION:

The last step of aerobic respiration is the oxidation of reduced coenzymes, i.e., $NADH_2$ and $FADH_2$ by molecular oxgyen through FAD, ubiquinone, cyt-b, cyt-c, cyt-c_1 , cyt-a and cyt$-a_3$. By oxidation of 1 molecules of $NADH_2$, 3 ATP molecules of $FADH_2 2ATP$ molecules aer Produced. In glycolysis 2 ATP molecules are produced from ADP.

Further $2NADH_2$ produce, give $2 \times 3 = 6$ ATP, on oxidative phosphorylation. Similarly in Krebs' cycle 2 ATP molecules are produced in the electron transport chain.

Q-26 - 34100311

In glycolysis, during oxidation electrons are removed by

(A) ATP

(B) glyceraldehyde-3-phosphate

(C) NAD^+

(D) molecular oxygen

CORRECT ANSWER: C

SOLUTION:

When 3-phosphoglyceraldehyde is converted into 1,3 diphosphoglyceric acid, two electrons and convert NAD^+ to NADH and one

$H^+ NAD^+ + 2H^+ + 2e^- \rightarrow NADH + H^+$

Q-27 - 34100314

In alcoholic fermentation

(A) oxygen is the electron acceptor

(B) triose phosphate is the electron donor while acetaldehyde is the electron acceptor

(C) triose phosphate is the electron donor while pyruvic acid is the electron acceptor

(D) there is no electron donor

CORRECT ANSWER: B

SOLUTION:

In alcoholic fermentation

(a) NADH (formed during conversion of triose-3 phosphate to 3 phosphoglycerate) is oxidised to

NAD^+

(b) electrons are accepted by acetaldehyde formed by

decarboxylation of pyruvate.

Watch Video Solution On Doubtnut App

Q-28 - 34100317

In which one of the following do the two names refer to one and the same thing

(A) Tricarboxylic acid cycle and urea cycle

(B) Kreb's cycle and Calvin cycle

(C) Tricarboxylic acid cycle and citric acid cycle

(D) Citric acid cycle and Calvin acid

CORRECT ANSWER: C

SOLUTION:

Tricarboxylic acid cycle is also known as citric acid cycle. This is an aerobic process, that takes place in the matrix of mitrochondria . Kreb that discovered this cycle in 1937 . So, this is also known as Krebs' cycle.

Q-29 - 34100324

The mechansim of ATP formation both in chlorophast and mitochondria is explained by

(A) relay pump theory of Godlewski

(B) Munch's pressure/mass flow model

(C) chemiosmotic theory of Mitchell

(D) Cholondy-Went's model

CORRECT ANSWER: C

SOLUTION:

In chemiosmotic -compling hypothesis, outward pumping of protons across the inner chlorophast or mitochondrial membrane results in accumulation of protons between outer membrane and inner membrane. A proton gradient is thus established . As protons now flow back passively force is utilised to synthesise ATP.

Q-30 - 34100340

The respiratory substrate yielding maximum number of ATP molecules among the following is

(A) Ketogenic amino acids

(B) glucose

(C) amylose

(D) glycogen

CORRECT ANSWER: B

SOLUTION:

Respiratory substrate yielding maximum number of ATP molecules is glucose. One glucose molecules on aerobic respiration yields 36 ATP molecules.

Watch Video Solution On Doubtnut App

Q-31 - 34100343

Life without air would be

(A) reductional

(B) free from oxidative damage

(C) impossible

(D) anaerobic

CORRECT ANSWER: D

SOLUTION:

Anaerobic means `in the absence of molecular oxygen', so life without air would be anaerobic . The atmosphere of earth at the time of origin of life was without free oxygen atoms, so the primitive atmosphere was reducing.

Watch Video Solution On Doubtnut App

Q-32 - 34100345

Out of 38 ATP molecules per glucose, 30 ATP molecules are formed from $NADH / FADH_2$ in

(A) respiratory chain

(B) Krebs' cycle

(C) oxidative decarboxylation

(D) EMP

CORRECT ANSWER: A

SOLUTION:

Respiration chain helphs in forming 32 ATP molecules form $NADH\,/\,FADH_2$ molecules. In which Oxidative phophorylation is the stnthesis of energy rich ATP molecules with the help of energy liberated during oxidation of reduced coenzymes. $(NADH_2, FADH_2)$. produced in glycolysis and Krebs' cycle. A total of $10NADH_2$ molecules are formed in aerobic respiration . They help in formation of 32 or 34 ATP molecules.

Watch Video Solution On Doubtnut App

Q-33 - 34100347

Link between glycolysis, Krebs cycle and β-oxidation of fatty acid or carbohydrate and fat metabolism is

(A) oxaloacetic acid

(B) succinic acid

(C) citric acid

(D) Acetyl Co-A

CORRECT ANSWER: D

SOLUTION:

The pyruvic and synthesised from glycolysis enters into mitochondria and undergoes oxidative decarboxylation to produces CO_2 and $NADH_2$. The CO-A . It is the

connecting link between glycolysis , Krebs' cycle and fat oxidation.

Watch Video Solution On Doubtnut App

Q-34 - 34100352

Apparatus to measure rate of respiration and R.Q. is

(A) auxanometer

(B) potometer

(C) respirometer

(D) manometer

CORRECT ANSWER: C

SOLUTION:

Respirometer is an instrument used to measure the rate

of respiration and also Respiratory Quotient (RQ) . The most common respirometer is Ganong's respirometer.

Watch Video Solution On Doubtnut App

Q-35 - 34100360

Terminal cytochrome of respiratory chain which donates electrons to oxygen is

(A) cyt-b

(B) cyt-c

(C) $cyt - a_1$

(D) $cyt - a_3$

CORRECT ANSWER: D

SOLUTION:

The ETS system contains various electron carriers such as cytochromes. The correct sequence of electron carrier/acceptor in ATP synthesis is cyt-b, cyt-c_1, cyt-c, cyt (a and cyt-a_3). Cyt-a_3 is the terminal cytochrome, it possess two copper centers, which help in transfer of electron to oxygen.

Watch Video Solution On Doubtnut App

Q-36 - 34100366

RQ is

(A) C/N

(B) N/C

(C) CO_2 / O_2

(D) O_2 / CO_2

CORRECT ANSWER: C

SOLUTION:

Respiratory Quotient (RQ) is the ratio of volume of CO_2 evolved to the volume of oxygen consumed per unit time per unit weight . Therefore, $RQ = CO_2 / O_2$.

It is useful in knowing the type of respiration, major transformations and respiratory substrate.

Watch Video Solution On Doubtnut App

Q-37 - 34100365

Incomplete oxidation of glucose into pyruvic acid with several intermediate steps is known as

(A) TCA-pathway

(B) glycolysis

(C) HMS-pathway

(D) Krebs' cycle

CORRECT ANSWER: B

SOLUTION:

Glycolysis is the sequence of enzyme mediated reactions by which glucose is degraded anaerobically into pyruvic acid in cell cytoplasm . The net gain of molecules of ATP during glycolysis is two.

Watch Video Solution On Doubtnut App

Q-38 - 34100295

Oxidation phosphorylation is

(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 group to ATP

(D) formation of ATP by energy released from electrons removed during substrate oxidation

---

CORRECT ANSWER: A

SOLUTION:

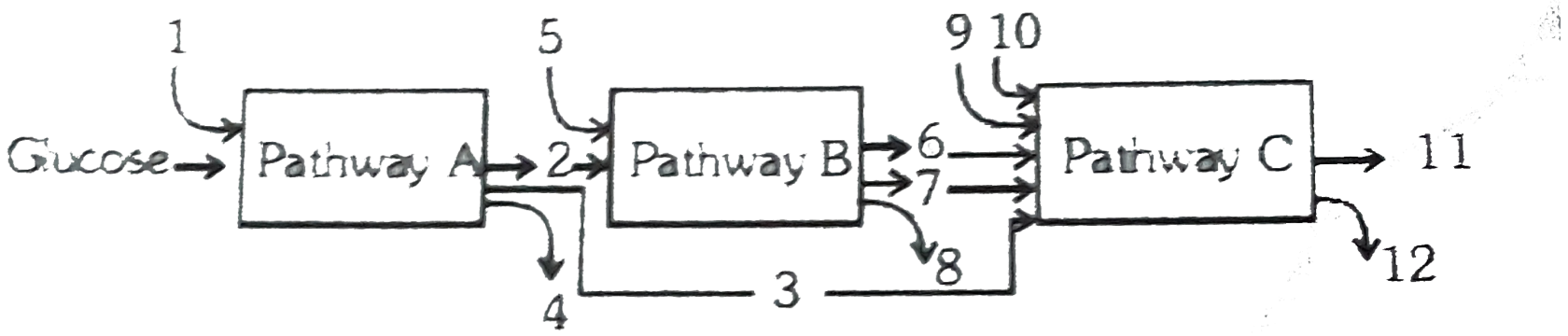
Oxidation phosphorylation is the process of formation of ATP from ADP and inorganic phophate (P_i) in the presnce of oxygen. It occurs mainly in the Electron Transport Chain (ETC) of cellular respiration.

Watch Video Solution On Doubtnut App

Q-39 - 34100297

The three boxes in this diagram represent the three major

biosynthetic pathways in aerobic respiration. Arrows represent net reactants or products.



Arrow numbered 4,8 and 12 can all be

(A) NADH

(B) ATP

(C) H_2O

(D) FAD^+ or $FADH_2$

CORRECT ANSWER: B

SOLUTION:

Pathway A is glycolysis , pathway B is the Krebs' cycle and pathways C is oxidative phosphorylation

Arrow 1-ADP or NAD^+

Arrow 2- Pyrvate

Arrow 3-NADH

Arrow 4- ATP

Arrow 5- ADP,NAD^+ or FAD

Arrow 6 and 7 -$FADH_2$ and $NADH$

(either one can be 6 or 7)

Arrow 8-ATP or CO_2

Arrow 9 and 10 -O_2 and ADP (either one can be 9 or 10)

Arrow 11 and 12 -H_2O and ATP (either one can be 11 or 12)

Watch Video Solution On Doubtnut App

Q-40 - 34100330

Anaerobic products of fermentation are

(A) protein and acetic acid

(B) alcohol , lactic acid or similar compounds

(C) ethers and acetones

(D) alcohol and lipoproteins

CORRECT ANSWER: B

SOLUTION:

Fermentation is defined as anaerobic break down of carbohydrates and other organic compounds to form aldehyde , alcohol and organic acids (lactic acid) with the help of microorganisms or their enzymes.

Watch Video Solution On Doubtnut App

Q-41 - 34100361

Out of 36 ATP molecules produced per glucose molecule during

respiration

(A) 2 are produced outside glycolysis and 34 during respiratory chain

(B) 2 are produced outside mitochondria and 34 inside mitochondria

(C) 2 during glycolysis and 34 during Krebs' cycle

(D) all are formed inside mitochondria

CORRECT ANSWER: B

SOLUTION:

A total of 38 ATP molecules are produced per glucose molecules during respiration . Out of which 2 ATP are produced outside mitochondria.

(i.e., glucoysis in cytoplasm) and 36 ATP inside mitochondria (i.e., ATP through respiratory chain.) In

contrast , in some cells the number of ATP produced inside mitochondria equals to 34 and thus, there is a net synthesis of 36 ATP molecules.

Watch Video Solution On Doubtnut App

Q-42 - 34100334

Respiratory quotient (RQ) for fatty acid is

(A) > 1

(B) < 1

(C) 1

(D) 0

CORRECT ANSWER: B

SOLUTION:

Respiratory Quotient (RQ)

$$= \frac{\text{volume of } CO_2 \text{ formed}}{\text{Volume of } O_2 \text{ utilised}}$$

In fats, large amount of O_2 is used to combine with H_2 ,

so output of CO_2 is less and RQ is only 0.70 , i.e., less than unity.

Watch Video Solution On Doubtnut App

Q-43 - 34100341

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 membrane

(D) ATP breaks down cyanide

CORRECT ANSWER: A

SOLUTION:

Cyanide is a deadly poison. It stops respiration by inhibiting electron flow from cyt-b to cyt $-c_1$. ATP is the energy currency of cell is injected in cyanide poisoning because, it is necessary for cellular functions.

Watch Video Solution On Doubtnut App

Q-44 - 34100344

End product of citric acid/Krebs' cycle is

(A) citric acid

(B) lactic acid

(C) Pyruvic acid

(D) $CO_2 + H_2O$

CORRECT ANSWER: D

SOLUTION:

Krebs' cycle or citric that takes place in the matrix of mitochondria begins by linking acetyl Co-A to oxaloacetic acid forming citric acid. In the presnce of various enzymes , cycle continues through the formation of various intermediates and release of CO_2 and H_2O as end-products.

Watch Video Solution On Doubtnut App

Q-45 - 34100350

At a temperature above $35C$

(A) rate of photsynthesis will decline earlier than that of respiration

(B) rate of respiration will decline earlier than that of photosynthesis

(C) both decline simultaneously

CORRECT ANSWER: A

SOLUTION:

Optimum temperature for photosynthesis is $10-25C$ for C_3 -plant and $30-45C$ for C_4 -plants Optimum temperature for respiration is $20C-30C$, i.e., respiration has a higher temperature optimum than photosynthesis and thus declines later.