

CASE STUDY QUESTION 01

Read the following and answer any four questions from (i) to (v)

All living cells require energy for various activities. This energy is available by the breakdown of simple carbohydrates either using oxygen or without using oxygen.

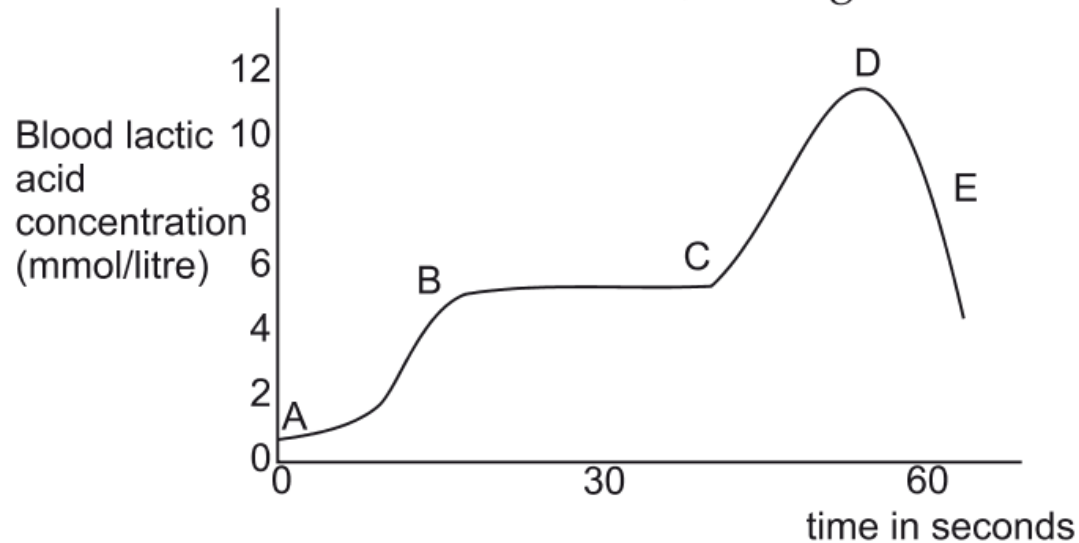
- (i) Energy in the case of higher plants and animals is obtained by
- (a) Breathing
 - (b) Tissue respiration
 - (c) Organ respiration
 - (d) Digestion of food

Tissue respiration is the process by which living cells absorb oxygen and release carbon dioxide. It is Internal respiration occurs in animals with a circulation system.

(ii) The graph below represents the blood lactic acid concentration of an athlete during a race of 400 m and shows a peak at point D.

Respiration in athletics:

The blood of an athlete was tested before, during and after a 400 m race.



Lactic acid production has occurred in the athlete while running in the 400 m race.

Which of the following processes explains this event?

- (a) Aerobic respiration
- (b) Anaerobic respiration
- (c) Fermentation
- (d) Breathing

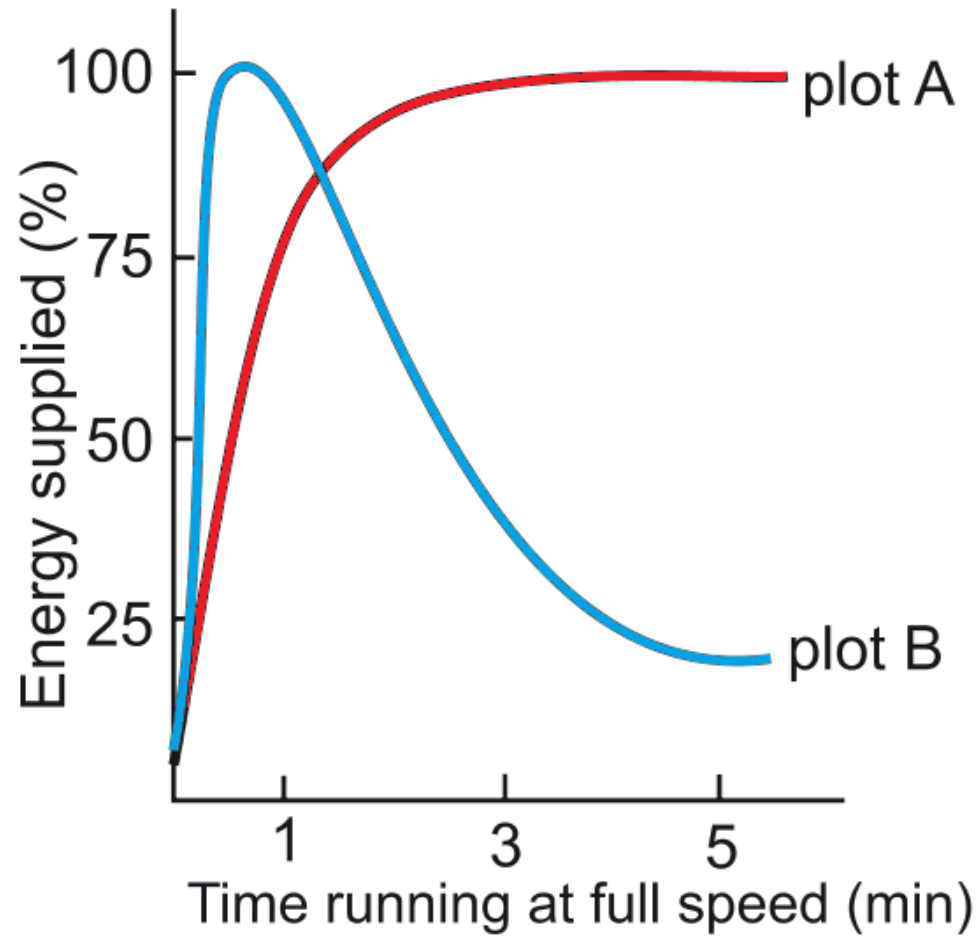
Which of the following processes explains this event?

- (a) Aerobic respiration
- (b) Anaerobic respiration
- (c) Fermentation
- (d) Breathing

Anaerobic means “without air”. Therefore, this type of cellular respiration does not use oxygen to produce energy.

During heavy or intensive exercise such as running, sprinting, cycling or weight lifting, our body demands high energy. As the supply of oxygen is limited, the muscle cells inside our body resort to anaerobic respiration to fulfil the energy demand.

(iii) Study the graph below that represents the amount of energy supplied with respect to the time while an athlete is running at full speed.



Choose the correct combination of plots and justification provided in the following table.

	Plot A	Plot B	Justification
(a)	Aerobic	Anaerobic	Amount of energy is low and inconsistent in aerobic and high in anaerobic.
(b)	Aerobic	Anaerobic	Amount of energy is high and consistent in aerobic and low in anaerobic.
(c)	Anaerobic	Aerobic	Amount of energy is high and consistent in aerobic and low in anaerobic.
(d)	Anaerobic	Aerobic	Amount of energy is high and inconsistent in anaerobic and low in aerobic.

(b)	Aerobic	Anaerobic	Amount of energy is high and consistent in aerobic and low in anaerobic
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(iv) The characteristic processes observed in anaerobic respiration are

i) presence of oxygen

ii) release of carbon dioxide

iii) release of energy

iv) release of lactic acid

(a) i) ,ii) only

(b) i), ii), iii) only

(c) ii), iii), iv) only

(d) iv) only

Ans. (c) ii), iii), iv) only

(v) Study the table below and select the row that has the incorrect information.

		Aerobic	Anaerobic
(a)	Location	Cytoplasm	Mitochondria
(b)	End Product	CO ₂ and H ₂ O	Ethanol and CO ₂
(c)	Amount of ATP	High	Low
(d)	Oxygen	Needed	Not needed

Aerobic Respiration can be found in the cytoplasm and the mitochondria.
Anaerobic Respiration can be found only in the cytoplasm.