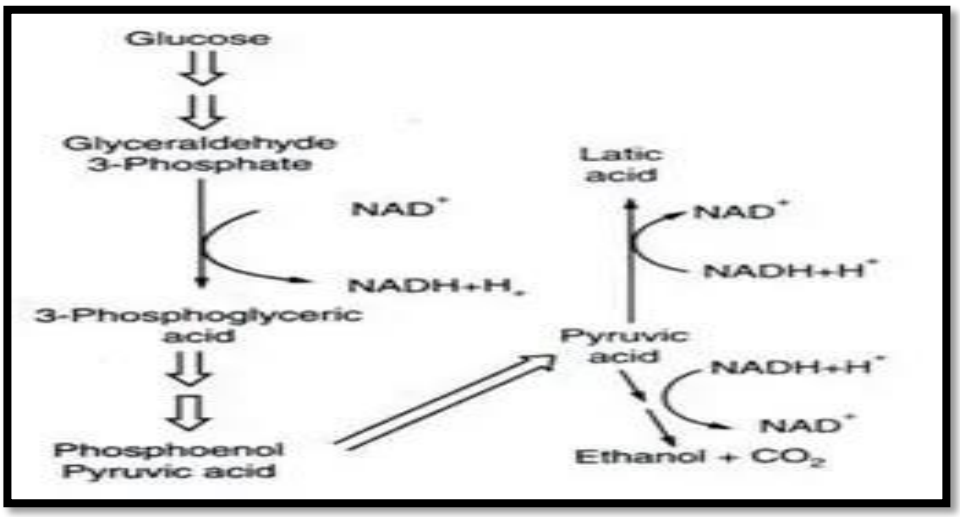
CBT DECEMBER 2023
CLASS – XI: BIOLOGY

GENERAL INSTRUCTION :

SCORE AND REVIEW OF ALL THE QUESTIONS WILL BE PROVIDED IN THE EMAIL TO ALL THE STUDENTS ON NEXT DAY AND AFTER CLOSING OF QUIZ TIME.

IMPORTANT : ALL THE STUDENTS SHOULD FILL THE CORRECT SCHOOL NAME FROM DROP DOWN BUTTON

Q.1: In fermentation, say by yeast, the incomplete oxidation of glucose is achieved under anaerobic conditions by sets of reactions where pyruvic acid is converted to CO2 and ethanol. The enzymes, pyruvic acid decarboxylase and alcohol dehydrogenase catalyse these reactions. Other organisms like some bacteria produce lactic acid from pyruvic acid.
In animal cells also, like muscles during exercise, when oxygen is inadequate for cellular respiration pyruvic acid is reduced to lactic acid by lactate dehydrogenase. The reducing agent is NADH+H+ which is reoxidised to NAD+ in both the processes. In both lactic acid and alcohol fermentation not much energy is released; less than seven per cent of the energy in glucose is released and not all of it is trapped as high energy bonds of ATP. Also, the processes are hazardous – either acid or alcohol is produced. Yeasts poison themselves to death when the concentration of alcohol reaches about 13 per cent.
In eukaryotes these steps take place within the mitochondria and this requires O2. Aerobic respiration is the process that leads to a complete oxidation of organic substances in the presence of oxygen, and releases CO2, water and a large amount of energy present in the substrate. This type of respiration is most common in higher organisms.



1. Assertion (A) : The pathway from glucose to lactic acid occur in 10 metabolic steps. Organisms will trap this energy and store in the form of chemical molecules.
   Reason (R) : Glucose is the only substrate for the production of energy.
   (a) (A) is true, (R) is true and (R) is the correct explanation for (A)
   (b) (A) is true, (R) is true but (R) is not the correct explanation for (A)
   (c) (A)is true but (R) is false
   (d) (A) is false but (R) is true
   Answer: (c)
   Feed Back: The pathway from Glucose to lactic acid occur in 10 metabolic step. Glycolysis is the metabolic pathway that converts glucose (C6H12O6) into

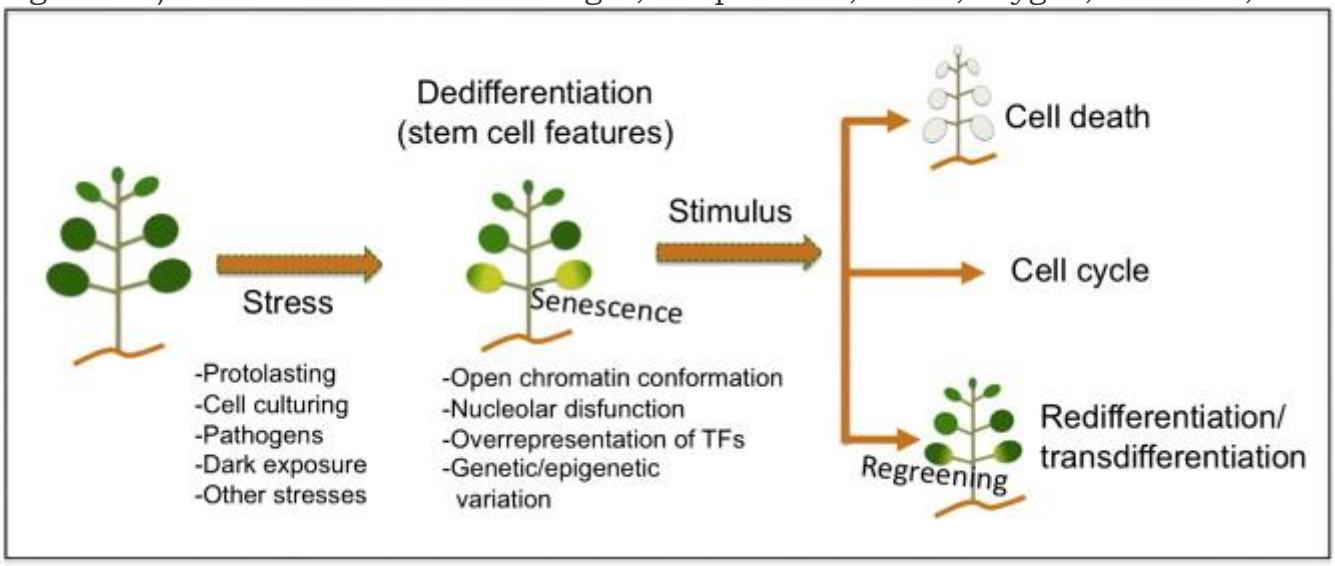
pyruvic acid, (CH3CO COOH). The free energy released in this process is used to form the high-energy molecules ATP and reduced NAD, Glucose is the not only substrate to produce energy. Protein and fat are also able to produce energy.

2. The energy-releasing process in which the substrate is oxidized without an external electron acceptor is called:
   (a) aerobic respiration
   (b) glycolysis
   (c) fermentation
   (d) photorespiration
   Answer: (c)
   Feed Back: During fermentation, the respiratory substrate is partially oxidized without on external electron acceptor. During aerobic respiration, oxygen acts as an external electron acceptor. Glycolysis is the common step in both aerobic and anaerobic respiration (fermentation.)

3. Fermentation is represented by equation:
   (a) $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + 673$ kcal Energy
   (b) $C_6H_{12}O_6 \rightarrow 2C_2H_5OH + 2CO_2 + 21$kcal Energy
   (c) $6CO_2 + 12\ H_2O \rightarrow C_6H_{12}O_2 + 6O_2$
   (d) $C_6H_{12}O_6 \rightarrow 6CO_2 + 6\ H_2O + 100$ kcal Energy
   Answer: (b)
   Feed Back: The process of fermentation occurs during anaerobic respiration. In fermentation an organism like (yeast) converts carbohydrate into alcohol or acid. Yeast performs fermentation to obtain energy by converting sugar into alcohol. Lactic acid baceteria converts carbohydrates into lactic acid.

Q.2: The cells derived from root apical and shoot-apical meristems and cambium differentiate and mature to perform specific functions. This act leading to maturation is termed as differentiation. During differentiation, cells undergo few to major structural changes both in their cell walls and protoplasm. For example, to form a tracheary element, the cells would lose their protoplasm. They also develop a very strong, elastic, lignocellulosic secondary cell walls, to carry water to long distances even under extreme tension.
Plants show another interesting phenomenon. The living differentiated cells that by now have lost the capacity to divide can regain the capacity of division under certain conditions. This phenomenon is termed as dedifferentiation. For example, formation of meristems – interfascicular cambium and cork cambium from fully differentiated parenchyma cells. While doing so, such meristems/tissues can divide and produce cells that once again lose the capacity to divide but mature to perform specific functions, i.e., get redifferentiated.
Development is a term that includes all changes that an organism goes through during its life cycle from germination of the seed to senescence. Plants follow different pathways in response to environment or phases of life to form different kinds of structures. This ability is called plasticity, e.g., heterophylly in cotton, coriander, and larkspur. In such plants, the leaves of the juvenile plant are different in shape from those in mature plants. On the other hand, difference in shapes of leaves produced in air and those produced in water in buttercup also represent the heterophyllous development due to environment. This phenomenon of heterophylly is an example of plasticity.
Development is considered as the sum of growth and differentiation. Development in plants is under the control of intrinsic and extrinsic factors. The former includes

both intracellular (genetic) or intercellular factors (chemicals such as plant growth regulators) while the latter includes light, temperature, water, oxygen, nutrition, etc.

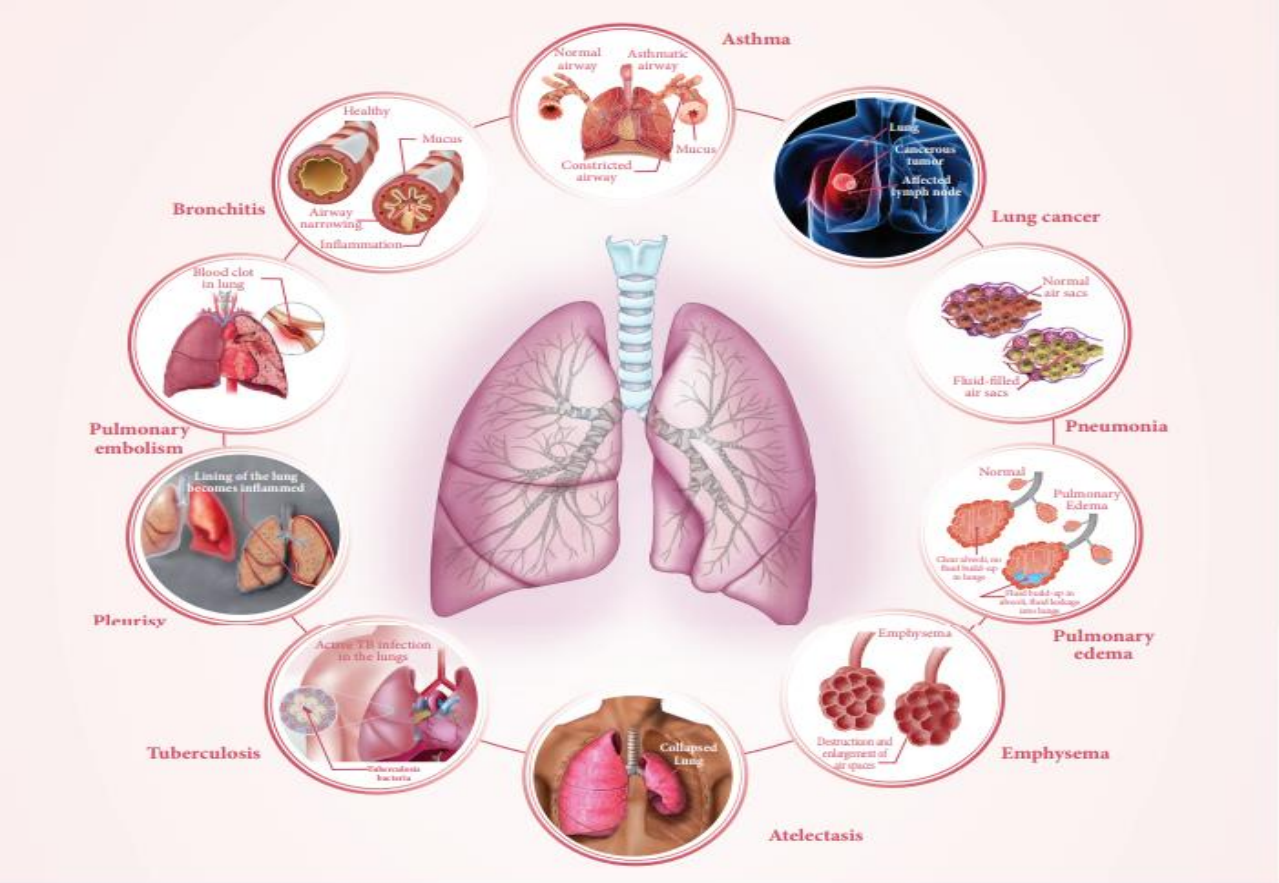


1. Assertion: The sum of growth and differentiation is development.
Reason: Development in plants is under the control of extrinsic factors only.
(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.
(b) If both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
(c) If Assertion is true but Reason is false.
(d) If both Assertion and Reason are false.
Answer: (c)
Feed Back: In the life of a plant, growth, differentiation, and development are closely related events. Development is sum of growth and differentiation. Development in plants is under control of both intrinsic and extrinsic factors. Intrinsic factors include intracellular genetic factors and intercellular factors growth regulators. Extrinsic factors are light, temperature, water, oxygen and nutrition, etc.

2. Differentiation is change of tissues from_____
(a) Meristematic to permanent
(b) Simple to complex
(c) Complex to simple
(d) Permanent to meristematic
Answer: (a)
Feed Back: Differentiation is change of tissue from meristematic to permanent. A cluster of cells, performing similar functions are known as tissues. In plants, tissues are classified broadly into two groups based on cell division capacity, namely – Meristematic and Permanent tissue. Meristematic tissues in plants consist of a mass of undifferentiated cells whose main function is to participate in plant growth.

Q.3: "Respiratory disorders or diseases are diseases of lungs and human airways that affect human respiration." A disorder is defined as a state of irregular functioning of the body. If left untreated, lung disease can produce health complications, problematic symptoms, and life-threatening conditions.
The most common respiratory diseases are asthma, chronic obstructive pulmonary disease, cystic fibrosis, lung cancer, tuberculosis, bronchitis, pneumonia, and emphysema.
Some respiratory diseases are acute, like an infection that will get better with treatment, while others are or become chronic and need to be managed.

Asthma is a difficulty in breathing causing wheezing due to inflammation of bronchi and bronchioles. Emphysema is a chronic disorder in which alveolar walls are damaged due to which respiratory surface is decreased. One of the major causes of this is cigarette smoking.
Occupational Respiratory Disorders: In certain industries, especially those involving grinding or stone-breaking, so much dust is produced that the defence mechanism of the body cannot fully cope with the situation. Long exposure can give rise to inflammation leading to fibrosis (proliferation of fibrous tissues) and thus causing serious lung damage. Workers in such industries should wear protective masks.



1. Asthma is a chronic lung disease affecting people of all ages. Asthma is caused due to inflammation of _____
   a) bronchi and bronchioles
   b) alveoli
   c) trachea
   d) pharynx
   Answer: a
   Feed Back: Asthma is difficulty in breathing causing wheezing due to inflammation of bronchi and bronchioles. Because of this air passage becomes narrow also it produces extra mucous which lastly leads into difficulty in breathing.

2. Emphysema comprises COPD (chronic obstructive pulmonary disease) which is one of the most preventable respiratory illnesses because it is so strongly linked to smoking. Emphysema is marked by:
   a) inflammation of nasal passage
   b) twisting of trachea
   c) filling of mucous in lungs
   d) damage of alveolar walls
   Answer: d

Feed Back: Emphysema is a chronic disorder which is marked of damage of alveolar walls. This leads to inadequate supply of oxygen to the body parts. The most common cause found so far is cigarette smoking.

3. Assertion : Dust particles when come in contact with respiratory tract lead to sneezing, running nose, redness of eyes etc.
   Reason : Allergic disorders are caused due to release of histamine.
   (a) (A) is true. (R) is true and (R) is the correct explanation for (A)
   (b) (A) is true. (R) is true but (R) is not the correct explanation for (A)
   (c) (A) is true but (R) is false
   (d) (A) is false but (R) is true

Answer: (a)
Feed Back: Dust particle may cause allergic reaction leading to sneezing, redness of eyes and irritation. The mechanism involves immunoglobulin E (IgE) antibodies binding to an allergen and then to a receptor on mast cells or basophils where it triggers the release of inflammatory chemicals such as histamine. Hence, both A and R are true and R is the correct explanation of A.

4. Respiratory disorders occur due to automobile exhaust because of the release of:
   (a) CO
   (b) CH4
   (c) Cl
   (d) H2O

Answer: (a)
Feed Back: Respiratory disorders occur due to automobile exhaust because of the release of CO. Automobile exhaust contains a high quantity of carbon monoxide gas (CO). CO poisoning occurs when carbon monoxide builds up in the blood. When too much CO is in the air, the body replaces the O2 in the RBCs with CO_2. CO may cause headache, chest pain (or angina), dizziness, vomiting, muscle fatigue and confusion etc.

5. Tuberculosis is a bacterial infection that can pass through the air between people. When it affects the lungs, the medical name for this is pulmonary tuberculosis. It can cause chest pain, severe coughing, and a range of other symptoms. The causative pathogen is:
   (a) Pseudomonas aeruginosa
   (b) Mycobacterium tuberculosis
   (c) Streptococcus pneumoniae
   (d) Escherichia coli

Answer: (b)
Feed Back: Lung tuberculosis is caused by 'Mycobacterium tuberculosis'. Tuberculosis (TB) is a communicable disease caused by the bacillus Mycobacterium tuberculosis. Nowadays, TB (tuberculosis) is still one of the top ten causes of death worldwide. About a quarter of one world's population is infected with Mycobacterium tuberculosis.