Cell: The Unit of Life

Assertion Reason Questions

Given below are two statements labelled as Assertion (A) and Reason (R). Select the most appropriate answer from the options given below:

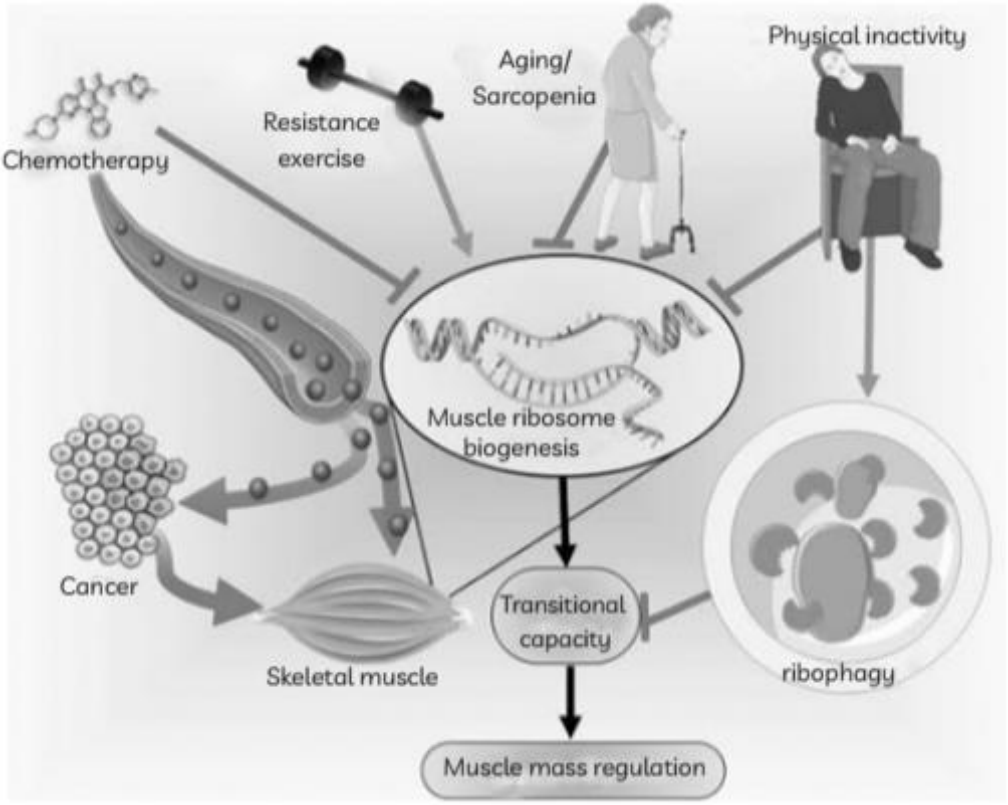
(a) Both A and R are true and R is the correct explanation of A.
(b) Both A and R are true and R is not the correct explanation of A.
(c) A is true but R is false.
(d) A is false but R is true.

1. Assertion (A): Rudolf Virchow modified the hypothesis of cell theory given by Schleiden and Schwann. Cell theory says that
Reason (R): all cells arise pre-existing cells. From

Ans. (b) Both A and R are true and R is not the correct explanation of A.
Explanation: Rudolf Virchow (1855) observed that new cells arise from pre-existing cells. (Omnis-cellula-e-cellula). He gave the final shape to cell theory which states that:
(1) All living organisms are made up of cells and product of cells.
(2) All cells arise from pre-existing cells.

2. Many antibiotics in clinical use target the bacterial ribosome by interfering with the protein synthesis machinery. However, targeting the human ribosome in the case of protein synthesis deregulations such as in highly proliferating cancer cells has not

been investigated at the molecular level up to now.



Assertion (A): Ribosomes are non- membrane-bound organelles found in both prokaryotic and eukaryotic cells.
Reason (R): Ribosomes are present only in the cytoplasm.

Ans. (c) A is true but R is false.
Explanation: Ribosomes are non-membrane bound organelles. It is found in both prokaryotic and eukaryotic cells. Besides cytoplasm, they are also found within the two organelles- chloroplast (in plants) and mitochondria and on rough ER.

3. Assertion (A): The fimbriae are elongated tubular structures made up of a special protein.
Reason (R): The pili are elongated tubular structures made up of a special protein.

Ans. (d) A is false but R is true.
Explanation: Pili are the elongated tubular structure. They are made up of special proteins. Fimbriae are small bristles-like fibres sprouting out of the cell.

4. Assertion (A): Prokaryotes have a single envelope system.
Reason (R): There is not even a single membrane that surrounds the prokaryotic cell.

Ans. (c)) A is true but R is false.
Explanation: The cell envelope of most prokaryotic organisms, particularly bacterial cells, is chemically complex. The cell envelope is made up of three layers, the outermost of which is the glycocalyx, followed by the cell wall and plasma membrane. Despite the fact that each layer of the envelope serves a separate purpose, they all work together to produce a single protective unit.

5. Assertion (A): Specialisation of cells is useful for organisms.
Reason (R): It increases the operational efficiency of an organism.

Ans. (a) Both A and R are true and R is the correct explanation of A.
Explanation: Animal bodies are made up of a variety of cell types. The human body has roughly 200 different types of specialised cells. The cells of one or more types are grouped together in a certain way and work together to play a particular purpose. A tissue is a collection of such cells. It is helpful for an organism when cells get specialised into a tissue, organ, or organ system. By avoiding duplication of effort through the division of labour, it improves operational efficiency.

6. Assertion (A): Lysosomal vesicles are found to be rich in many types of hydrolytic enzymes.
Reason (R): Lysosomes help in digesting proteins, lipids, and nucleic acids.

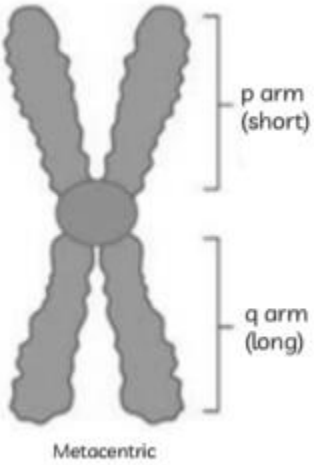
Ans. (a) Both A and R are true and R is the correct explanation of A.
Explanation: Lysosomes have many hydrolytic enzymes like lipases, proteases, and nucleases. These enzymes can be used to digest lipids, proteins, and nucleic acid, respectively.

7. Assertion (A): The nucleolus is a membrane- bound structure and its content is continuous with the nucleoplasm.
Reason (R): The nucleolus is a site of active ribosomal RNA synthesis.

Ans. (d) A is false but R is true.
Explanation: Since the content of the nucleolus is continuous with the rest of the nucleoplasm, it is not a membrane-bound structure and so the assertion (A) is not

correct. Reason (R) correctly states that the nucleolus is a site of ribosomal RNA synthesis.

8. A metacentric bisatellited microchromosome was detected in all metaphases from an amniotic culture performed because of maternal age. A wide-ranging survey of the literature failed to disclose any consistent anomaly associated with such a marker, but did reveal that the clinical picture of patients manifesting it could range from complete normality through mental retardation to a variety of deformities.



Assertion (A): The metacentric chromosomes have two equal chromosomal arms.
Reason (R): In metacentric chromosomes, the centromere holds the two chromatids in the middle of the chromosome.

Ans. (a) Both A and R are true and R is the correct explanation of A.
Explanation: It is true that metacentric chromosomes have two equal arms as the centromere is present in the middle of the chromosome.