

Creation of Objective Questions with Multiple Correct Answers **using generative text models**

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Sure! I can help you generate objective questions with multiple correct answers using generative text models. Please provide me with a topic or subject for which you would like the questions to be created.

Objective The goal of this internship assignment is to test your proficiency in natural language processing. You will be tasked with developing a solution that can automatically generate objective questions with multiple correct answers based on a given chapter from a subject. The generated questions should test the reader's understanding of the chapter and have more than one possible correct answer to increase the complexity and challenge of the questions. The generated questions should not only test the reader's comprehension of the chapter but also encourage them to think beyond the surface level and explore different perspectives and possibilities. Ultimately, the objective of this project is to develop a robust and accurate solution that can aid educators in creating engaging and challenging assessments for their students.

Example MCAs Context: Photosynthesis is a process used by plants and other organisms to convert light energy into chemical energy that, through cellular respiration, can later be released to fuel the organism's activities. Some of this chemical energy is stored in carbohydrate molecules, such as sugars and starches, which are synthesized from carbon dioxide and water – hence the name photosynthesis, from the Greek *phōs*, "light", and *synthesis*, "putting together". Most plants, algae, and cyanobacteria perform photosynthesis; such organisms are called photoautotrophs. Photosynthesis is largely responsible for producing and maintaining the oxygen content of the Earth's atmosphere, and supplies most of the energy necessary for life on Earth. Although photosynthesis is performed differently by different species, the process always begins when energy from light is absorbed by proteins called reaction centers that contain green chlorophyll (and other colored) pigments/chromophores. In plants, these proteins are held inside organelles called chloroplasts, which are most abundant in leaf cells, while in bacteria they are embedded in the plasma membrane. In these light-dependent reactions, some energy is used to strip electrons from suitable substances, such as water, producing oxygen gas. The hydrogen freed by the splitting of water is used in the creation of two further compounds that serve as short-term stores of energy, enabling its transfer to drive other reactions: these compounds are reduced nicotinamide adenine dinucleotide phosphate (NADPH) and adenosine triphosphate (ATP), the "energy currency" of cells. In plants, algae and cyanobacteria, sugars are synthesized by a subsequent sequence of light-independent reactions called the Calvin cycle. In the Calvin cycle, atmospheric carbon dioxide is incorporated into already existing organic carbon compounds, such as ribulose biphosphate (RuBP). [5] Using the ATP and NADPH produced by the light-dependent reactions, the resulting compounds are then reduced and removed to form further carbohydrates, such as glucose. In other bacteria, different mechanisms such as the reverse Krebs cycle are used to achieve the same end. The first photosynthetic organisms probably evolved early in the evolutionary history of life and most likely used reducing agents such as hydrogen or hydrogen sulfide, rather than water, as sources of electrons. Cyanobacteria appeared later; the excess oxygen they produced contributed directly to the oxygenation of the Earth, which rendered the evolution of complex life possible. Today, the average rate of energy capture by photosynthesis globally is approximately 130 terawatts, which is about eight times the current power consumption of human civilization. Photosynthetic organisms also convert around 100–115 billion tons (91–104 Pg petagrams, or billion metric tons), of carbon into biomass per year.

That plants receive some energy from light – in addition to air, soil, and water – was first discovered in 1779 by Jan Ingenhousz.

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Here are some objective questions with multiple correct answers based on the provided context:

1. Which process converts light energy into chemical energy? a) Cellular respiration b) Photosynthesis c) Oxidation d) Fermentation
2. What is the name of the process that synthesizes carbohydrates from carbon dioxide and water? a) Photosynthesis b) Cellular respiration c) Glycolysis d) Fermentation
3. Which organisms perform photosynthesis? a) Plants b) Algae c) Cyanobacteria d) All of the above
4. Where are the proteins called reaction centers that contain chlorophyll pigments located in plants? a) Chloroplasts b) Plasma membrane c) Nucleus d) Mitochondria
5. Which compounds serve as short-term stores of energy in the light-dependent reactions of photosynthesis? a) NADPH and ATP b) Glucose and starch c) Ribulose biphosphate (RuBP) d) Water and oxygen
6. What is the "energy currency" of cells? a) NADPH b) ATP c) Glucose d) RuBP
7. Which reactions are responsible for the synthesis of sugars in plants, algae, and cyanobacteria? a) Light-dependent reactions b) Light-independent reactions (Calvin cycle) c) Cellular respiration d) Fermentation
8. How do photosynthetic organisms capture energy from light? a) By absorbing light through proteins b) By converting air, soil, and water into energy c) By releasing oxygen gas d) By using reducing agents as sources of electrons
9. What contributed to the oxygenation of the Earth? a) Photosynthesis by cyanobacteria b) Water splitting in light-dependent reactions c) Calvin cycle in plants d) Fermentation by bacteria
10. Approximately how much energy capture by photosynthesis occurs globally? a) 130 megawatts b) 130 terawatts c) 130 gigawatts d) 130 kilowatts

Please note that the correct answers may vary depending on the interpretation of the context and the specific knowledge base being assessed.

with answer

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Certainly! Here are the objective questions with multiple correct answers along with the corresponding answers based on the provided context:

1. Which process converts light energy into chemical energy? Answer: b) Photosynthesis
2. What is the name of the process that synthesizes carbohydrates from carbon dioxide and water? Answer: a) Photosynthesis
3. Which organisms perform photosynthesis? Answer: d) All of the above (Plants, Algae, Cyanobacteria)
4. Where are the proteins called reaction centers that contain chlorophyll pigments located in plants? Answer: a) Chloroplasts
5. Which compounds serve as short-term stores of energy in the light-dependent reactions of photosynthesis? Answer: a) NADPH and b) ATP
6. What is the "energy currency" of cells? Answer: b) ATP

7. Which reactions are responsible for the synthesis of sugars in plants, algae, and cyanobacteria? Answer: b) Light-independent reactions (Calvin cycle)
8. How do photosynthetic organisms capture energy from light? Answer: a) By absorbing light through proteins
9. What contributed to the oxygenation of the Earth? Answer: a) Photosynthesis by cyanobacteria
10. Approximately how much energy capture by photosynthesis occurs globally? Answer: b) 130 terawatts

Please note that while these answers are based on the provided context, variations in interpretation may exist, and some questions may have additional correct answers.

Photosynthesis is the process by which plants, algae and some bacteria use sunlight, carbon dioxide and water to prepare their food. This is a biogeochemical process in which light energy is converted into chemical energy.

Photosynthesis takes place in the chloroplast. The chlorophyll present in the chloroplast traps the light from the sun and carries out the process.

Photosynthesis MCQs

1. Photosynthesis occurs in

- a. Chloroplast
- b. Golgi body
- c. Endoplasmic reticulum
- d. Nucleus

2. The optimum temperature for photosynthesis is

- a. 25-35°C
- b. 10-15°C
- c. 35-40°C
- d. 20-25°C

Also Read: [Photosynthesis](#)

3. Photorespiration occurs in

- a. Four cell organelles
- b. Two cell organelles
- c. One cell organelle
- d. Three cell organelle

4. Reduction of NADP occurs in

- a. Oxidative photophosphorylation
- b. Cyclic photophosphorylation

- c. Non-cyclic photophosphorylation
- d. None

5. Kranz anatomy is found in the leaves of

- a. Wheat
- b. Mustard
- c. Potato
- d. Sugarcane

Also Read: [Light Reaction](#)

6. Peroxisomes are involved in which type of reactions

- a. Calvin cycle
- b. Glyoxylate cycle
- c. Glycolate cycle
- d. Bacterial photosynthesis

7. Photorespiration involves oxidation of

- a. PGA
- b. RuBP
- c. Chlorophyll a
- d. Both a and b

8. C₃ and C₄ plants differ with respect to

- a. Number of ATP molecules consumed
- b. First product
- c. The substrate which accepts carbon dioxide
- d. All

Also Read: [Photorespiration](#)

9. In Calvin cycle, 1 molecule of glucose is formed from

- a. $6\text{CO}_2 + 30\text{ATP} + 12\text{NADPH}$
- b. $6\text{CO}_2 + 12\text{ATP}$
- c. $6\text{CO}_2 + 18\text{ATP} + 12\text{NADPH}$
- d. $6\text{CO}_2 + 18\text{ATP} + 30\text{NADPH}$

10. Where does the light reaction takes place?

- a. Grana
- b. Stroma
- c. Cytoplasm
- d. Endoplasmic reticulum

11. Electrons from the excited chlorophyll molecules of PS-II are first accepted by

- a. Pheophytin
- b. Ferredoxin
- c. Cytochrome f
- d. Cytochrome b

Also Read: [Electron Transport Chain](#)

12. Non-cyclic photophosphorylation results in the production of

- a. NADH
- b. NADPH
- c. ATP
- d. ATP and NADPH

13. DCMU inhibits

- a. PS-I
- b. PS-II
- c. Oxidative phosphorylation
- d. It destroys chloroplast

Also Read: [Glycolysis](#)

14. Maximum photosynthesis occurs in

- a. Blue light
- b. Red light
- c. White light
- d. Green light

15. The first acceptor of CO₂ in C₄ plants is

- a. Aspartic acid
- b. Malic acid
- c. Oxaloacetic acid
- d. Phosphoenolpyruvate

16. The first product of C₄ pathway is

- a. PGA
- b. DHAP
- c. Oxaloacetate
- d. Phosphoenolpyruvate

Also Read: [TCA cycle](#)

17. The two pigment system theory of photosynthesis was proposed by

- a. Aron
- b. Blackman

- c. Hill
- d. Emerson

18. H₂ donor during photosynthesis is

- a. ATP
- b. NADP
- c. NADPH
- d. NADH

Also Read: [Photosynthesis in Higher Plants](#)

19. The minerals involved in splitting reaction during photosynthesis is

- a. Potassium and manganese
- b. Magnesium and chlorine
- c. Potassium and chlorine
- d. Manganese and chlorine

20. The water-soluble photosynthetic pigment is

- a. Chlorophyll a
- b. Xanthophyll
- c. Anthocyanin
- d. Chlorophyll b

Also Read: [Calvin cycle](#)

Answer Key

1- a	2- d	3- d	4- c	5- d	6- c	7- b	8- d	9- c	10- a
11- a	12- d	13- b	14- b	15- d	16- c	17- d	18- c	19- d	20- c