

Instructions

Question	Question title	Marks	Question type
i	Instructions		Information or resources

Objective 1. Describe the structure and function of macromolecules in the cell

Question	Question title	Marks	Question type
1	Amino acids	3	Essay
2	Inhibition	2	Essay
3	Aquaporins	1	Multiple Response
4	Briefly explain	2	Essay
5	Hydrolysis	1	Multiple Choice
6	Tertiary structure	1	Multiple Choice

Objective 2. Describe the build-up of the cell and the function of the organelles as well as how cells obtain energy

Question	Question title	Marks	Question type
7	Plant and animal cell	1	Multiple Response
8	Oxidative phosphorylation	1	Multiple Response
9	Oxidative phosphorylation	1	Multiple Choice
10	Cytoskeleton	1	Multiple Response
11	Golgi apparatus	1	Multiple Response
12	SER	1	Multiple Response
13	Osmosis	3	Text Entry

14	Protein production	4	Essay
15	ATP production	3	Essay
16	Briefly explain	3	Essay
17	Photosynthesis	1	Multiple Choice

Objective 3. Describe how the cell communicates and what occurs during signal transduction

Question	Question title	Marks	Question type
18	Cell signaling	3	Essay
19	Receptors	4	Essay
20	Hormone	1	Multiple Response
21	Second messenger	1	Graphic Gap Match
22	Signal molecule	1	Multiple Choice

Objective 4. Describe the process from gene to protein

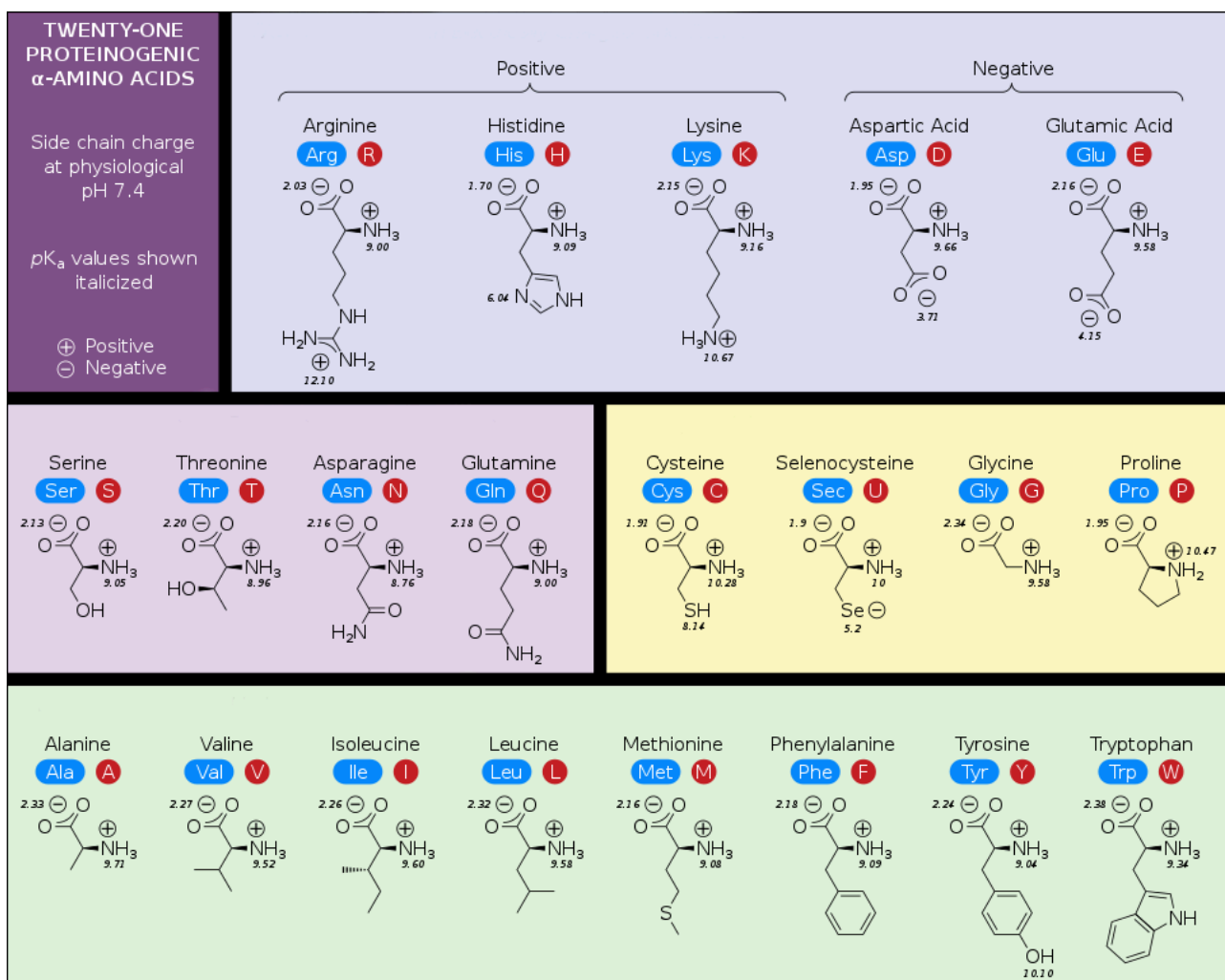
Question	Question title	Marks	Question type
23	Transcription/translation	5	Essay
24	Post-translational modification	1.5	Essay
25	Mutation	1.5	Essay
26	Briefly explain	1	Essay
27	Aminoacyl synthetase	1	Multiple Choice

1 Amino acids

The tertiary structure of a protein can be held in place by different chemical bonds between the amino acids' sidechains. Name three types of bonds and give an example of two amino acids that can form the specific bond. Use the figure below as help to identify the amino acids. Both the name and the amino acids has to be correct for points. **(1 p for each chemical bond and amino acids that is entirely correct. Max 3 p)**

Example of how to answer.

Chemical bond	Amino acid 1	Amino acid 2
Imaginary bond	Arginine	Histidine
...
...
















Words: 0

Maximum marks: 3

2 Inhibition

Enzyme activity can be regulated by noncompetitive inhibition. Describe this mechanism

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  |  |  |  | Σ | 

Words: 0














Maximum marks: 2

4 Briefly explain

Briefly explain the following:

1. Pinocytosis
2. Hydrolysis
3. Prosthetic group
4. Glycoprotein

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  |  |  |  | Σ | 











Words: 0

Maximum marks: 2

14 Protein production

The insulin receptor (IR) is a transmembrane receptor. Give a detailed explanation of the cell's production of this protein, and your explanation has to include where the protein is produced, how the protein is transported in the cell, organelles or structures involved and how the protein finds its final destination.

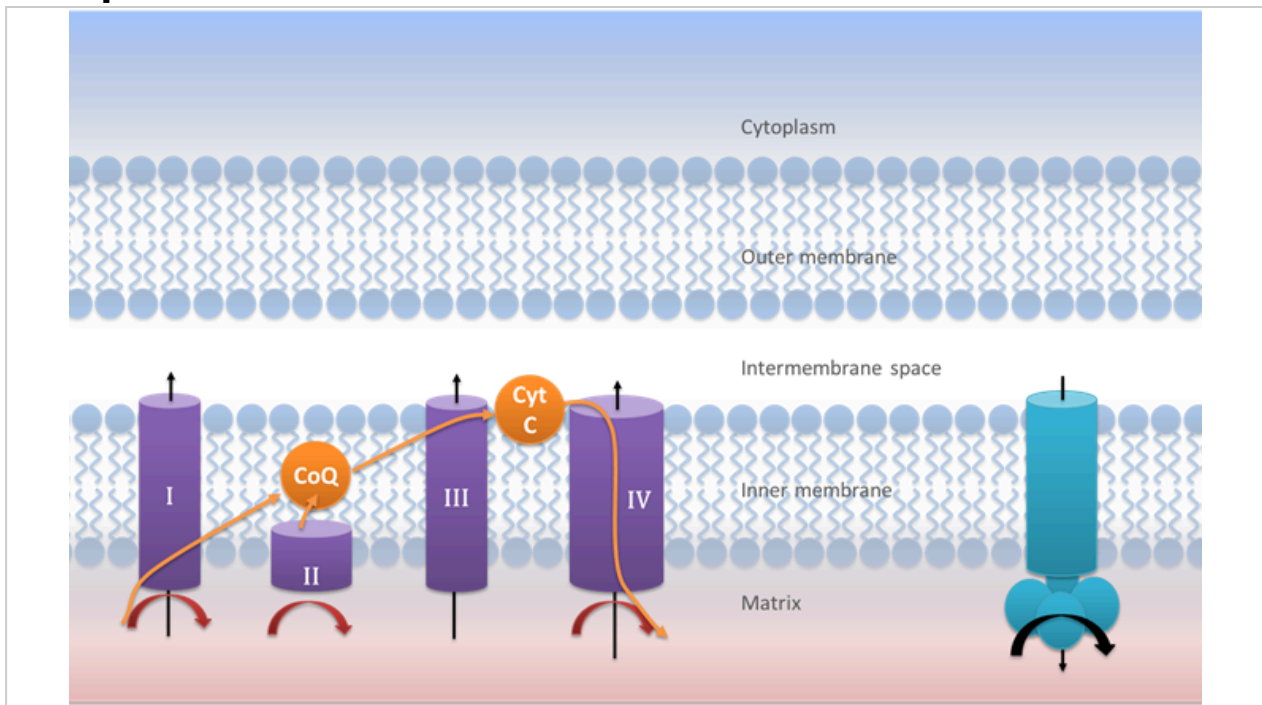
Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  | Σ | 

Words: 0

Maximum marks: 4

15 ATP production



The majority of the ATP molecules are produced in the mitochondrion using a specific enzyme.

1. What is the name of the enzyme? **(1p)**
2. Explain how the enzyme produce ATP in cells, what is the role of the proton gradient in this process and how is the proton gradient generated? **(2p)**

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x | | | | | | | | | | | | Σ |

Words: 0

Maximum marks: 3

16 Briefly explain

Briefly explain the function of the following terms/components.

1. Coenzyme A
2. NAD⁺
3. Citric acid cycle
4. Anabolism
5. β -oxidation
6. Calvin cycle

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x | | | | | | | | | |

| Σ |











Words: 0



Maximum marks: 3

18 Cell signaling

Name and briefly explain the three stages of cell signaling.

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  |  |

 | Σ | 

Words: 0













Maximum marks: 3

19 Receptors

A cell uses both transmembrane receptors and intracellular receptors. Explain the difference between a transmembrane receptor and an intracellular receptor. Do only include information about the two points described below.

- Where are the different receptors located and what is the purpose with the location?
- What types of signals do the receptors detect and what kind of chemical properties has the different signals?

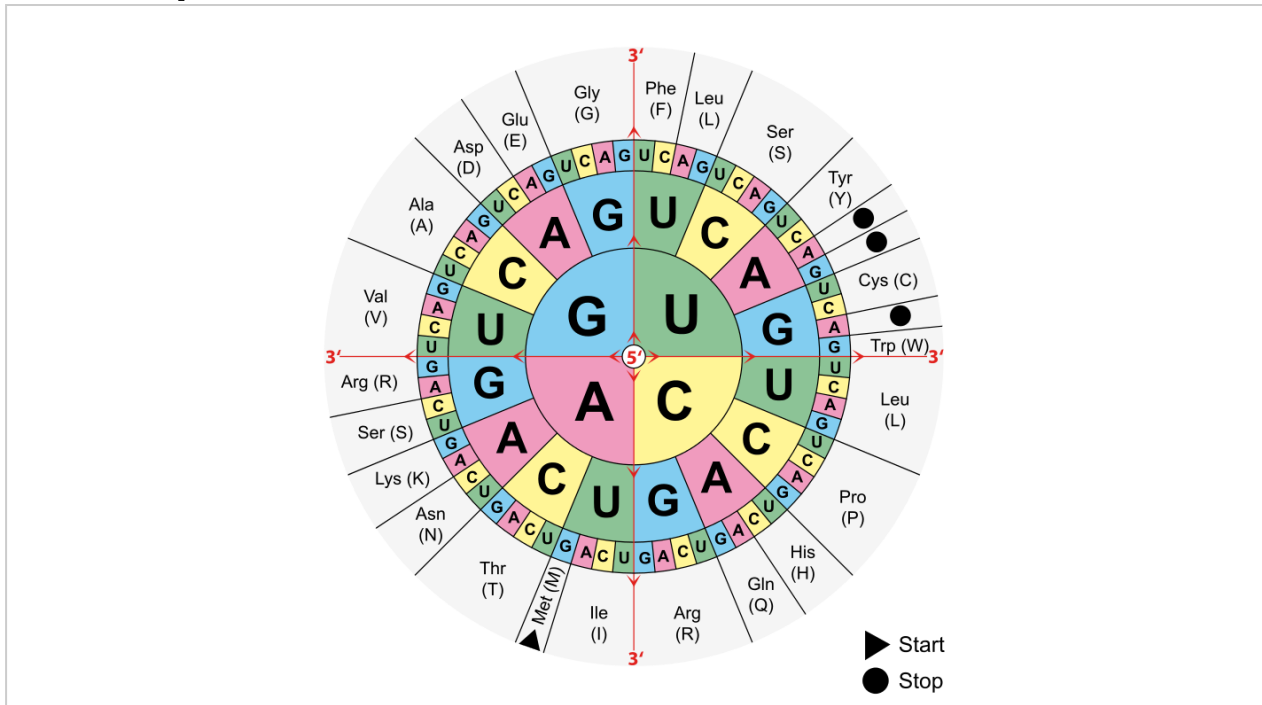
Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  |  |  | Σ | 

Words: 0

Maximum marks: 4

23 Transcription/translation



You have the following template DNA-strand. A gene is activated and the transcribed sequence is marked in bold.

3'–GCCT**GTTCAGTAAAAA**TATACTCGTTT**ACA**ACTCATGCAATCCGT–5'

- Write the correct mRNA sequence (label the ends correctly).
- Write the correct amino acid sequence that will be generated from this mRNA.

Fill in your answer here

Format ▼ | **B** | *I* | U | \times_2 | \times^2 | \mathcal{I}_x | | | | | | | | | | |











Words: 0

Maximum marks: 5

24 Post-translational modification

Give three examples of post-translational modification.

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  | Σ | 











Words: 0



Maximum marks: 1.5

25 Mutation

What is the effect on protein level of a nonsense mutation, a missense mutation and a silent mutation, respectively in a gene and why is it like that?

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  | 

 | Σ | 

Words: 0













Maximum marks: 1.5

26 Briefly explain

Briefly explain the function of the following terms/components.

1. Ribozyme
2. Coupled transcription and translation

Fill in your answer here

Format | **B** | *I* | U | x_2 | x^2 | I_x |  |  |  |  |  |  |  |  |  | Ω |  |  | Σ | 

Words: 0

Maximum marks: 1