



UNICUS OLYMPIADS

Sample Paper (2020-21)

Class 11

Unicus Science Olympiad



Section – Class* <small>*Syllabus covered</small>	Total Questions	Marks per Questions	Total Questions
Classic Section – Class 10	28	1	28
Classic Section – Class 9	12	1	12
Scholar Section – Class 10	7	2	14
Scholar Section – Class 9	3	2	6
Grand Total	50		60

1. The weight of a person on the Moon is about $\frac{1}{6}$ times that on the Earth. He can lift a mass of 23 kg on the Earth. What will be the maximum mass, which can be lifted by the same force applied by the person on the Moon?

- a) 136 kg
 b) 276 kg
 c) 138 kg
 d) 248 kg

Correct Answer: c

1 Mark

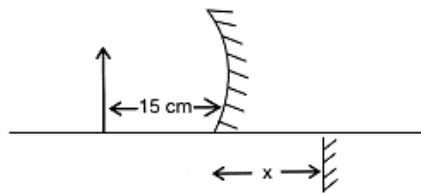
2. Three elements X, Y, Z form a Döbereiner triad. The difference in atomic weights between elements Y, Z is 45. If atomic weight of X is 35, find the atomic weight of elements X, Y and Z:

- a) X- 35, Y-80, Z-125
 b) X- 25, Y-70, Z-115
 c) X- 35, Y-40, Z-125
 d) X- 35, Y-80, Z-215

Correct Answer: a

1 Mark

3. An object is placed in front of a concave and plane mirror as shown in the figure given below. If the focal length of the concave mirror is 25 cm and the virtual image coincide each other, determine the value of x:



- a) 11.25 cm
 b) 22.5 cm
 c) 35 cm
 d) 12.5 cm

Correct Answer: a

1 Mark

4. Usually, chrysanthemum plants are found to propagate naturally and found spreading in the entire area.

1. Which method of propagation does it depict?
 2. Can they be propagated by any other propagation? If yes, identify that method:

- a) 1. Root suckers
 2. Yes, cutting
 b) 1. Cutting
 2. No
 c) 1. Cutting
 2. Yes, layering
 d) 1. Root suckers
 2. No

Correct Answer: a

1 Mark

5. What is the correct increasing order of oxidation state of nitrogen in following compounds?



- a) $\text{NH}_3 < \text{NO}_2 < \text{N}_2 < \text{NH}_2\text{OH}$ b) $\text{NO}_2 < \text{NH}_3 < \text{NH}_2\text{OH} < \text{N}_2$
c) $\text{NH}_3 < \text{NH}_2\text{OH} < \text{NO}_2 < \text{N}_2$ d) $\text{NH}_3 < \text{NH}_2\text{OH} < \text{N}_2 < \text{NO}_2$

Correct Answer: d

1 Mark

6. Consider the following statements and choose the correct option:

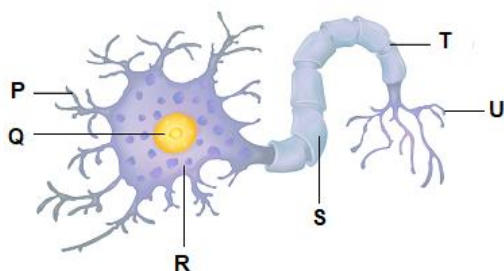
1. During inhalation, the muscles of the ribs and the diaphragm contract.
2. The space in the thoracic cavity increases during the exhalation process.
3. In systole, phase, the ventricles expand and the inflow of blood take place from heart to arteries.
4. Veins carry blood from heart to different parts of the body.

- a) Only 1 is correct b) Only 2 is correct
c) Both 2 and 3 are correct d) 2, 3 and 4 are correct

Correct Answer: a

1 Mark

7. Refer to the given structure of a neuron. Select the correct option:



- a) T carries impulses from the cell body to other neurons.
b) P receive impulses.
c) R contains the major concentration of the cytoplasm and the central nucleus of the neuron.
d) All of the above statements are correct

Correct Answer: d

1 Mark

8. Ramesh added a dilute ferrous sulphate solution gradually to the beaker containing acidified permanganate solution. He noticed that the light purple colour of the solution fades and finally disappears.

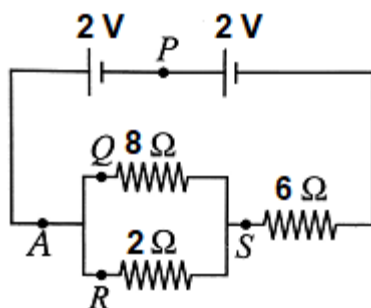
Which of the following is the correct explanation for the observation?

- a) KMnO_4 is an unstable compound and decomposes in presence of FeSO_4 to a colourless compound.
- b) KMnO_4 is an oxidising agent, it oxidises FeSO_4 .
- c) FeSO_4 acts as an oxidising agent and oxidises KMnO_4 .
- d) The colour disappears due to dilution; no reaction is involved.

Correct Answer: b

1 Mark

9. Consider the following circuit. At which point is the value of current smallest?



- a) P and Q
- b) Q only
- c) P and R
- d) S only

Correct Answer: b

2 Marks

10. Match the following:

Column I (Sample)

- 1. 1 g of CaCO_3
- 2. 52 u of He
- 3. 4.25 g of NH_3
- 4. 1.4 moles of PCl_3

Column II (Number of atoms)

- P. 7.82×10^{24}
- Q. 1.5×10^{23}
- R. 3.36×10^{24}
- S. 6.022×10^{21}

- a) 1-P, 2-Q, 3-S, 4-R
- c) 1-S, 2-P, 3-R, 4-P

- b) 1-S, 2-P, 3-Q, 4-R
- d) 1-S, 2-Q, 3-P, 4-R

Correct Answer: b

2 Marks