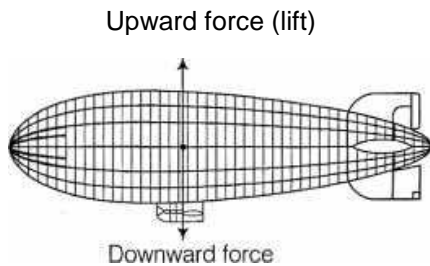




Olympiad Aptitude Test Science- Grade IX

1. An airship is moving forwards at constant height.



Which statement is correct?

- a Gravity no longer has any effect
- b The airship now has zero mass
- c The potential energy is zero
- d The upward and downward forces are balanced

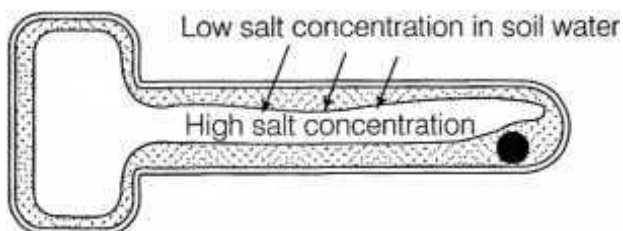
2. Match the items given in Column I with that given in Column II and choose the correct option using the codes given below the columns.

	Column 1		Column II
A.	0.25 mol oxygen	1	N_A molecules
B.	18 g water	2	$N_A/4$ molecules
C.	46 g Na-atom	3	N_A atoms
D.	1 mol C-atom	4	$N_A \times 2$ atoms

Codes

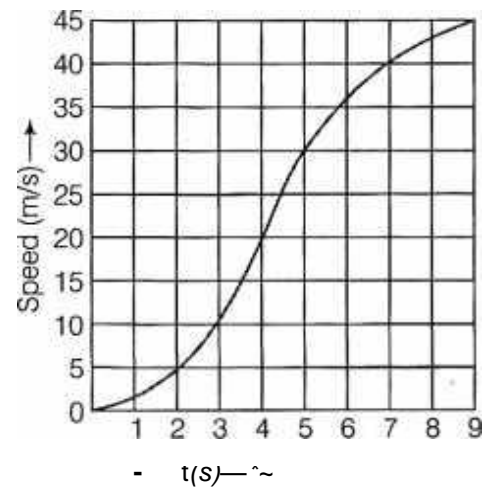
A B C D	A B C D
a 2 1 4 3	b 1 2 4 3
c 2 4 1 3	d 2 1 3 4

3. The arrows show the movement of salts into a cell.



Which of the following correctly describes the movement?

- a Active transport against the concentration gradient
 - b Active transport down the concentration gradient
 - c Diffusion against the concentration gradient
 - d Diffusion down the concentration gradient
4. Below is the list of animals along with the phyla to which they belong. Find the incorrect pair.
- a Leech - Phylum-Annelida
 - b Octopus - Phylum-Mollusca
 - c Liver fluke - Phylum-Aschelminthes
 - d Starfish - Phylum-Chordata
5. The graph shows the speed of a car as it accelerates from rest. During part of this time the acceleration is uniform.



What is the size of this uniform acceleration?

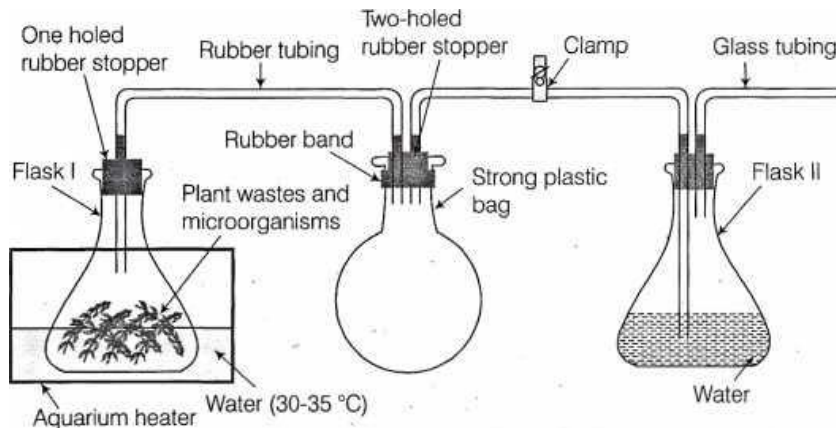
- a 7.5 m/s^2
- b 8 m/s^2
- c 7 m/s^2
- d 10 m/s^2

6. Biogas is a mixture of the gases methane and carbon dioxide. Biogas is a source of energy because methane releases energy when it is burnt. Digestion of plant wastes by microorganisms produces biogas. These microorganisms function at 30-35° C.

The table shows some characteristics of carbon dioxide and methane.

Characteristic	Carbon dioxide	Methane
Solubility in water	High	Low
Flammability	Low	High

Brooke used these pieces of equipment to collect biogas.



After four weeks, Brooke removed the clamp. What was the purpose of the water in flask II?

- To prevent methane from burning
- To provide a warm environment for the microorganisms to function
- To dissolve carbon dioxide and separate methane from carbon dioxide
- To dissolve the plant wastes so that it can be digested by microorganisms

7. Which of the following is/are included in the hypothesis for the cause of a disease?

- agent, of disease
- a time, place and person
- an assumption based on previous disease encountered.
- Host of disease
- Environment

Select the appropriate option

- A and B
- A, D and E
- C and D
- All of the above

8. Which of the following statements is correct?

- Pitch of sound depends on its frequency.
- Loudness of sound depends on its frequency.
- Sound travels faster in air than in solids.

D. Speed of sound in air varies with temperature.

- A and B
- B and C
- A and D
- A, B and D

9. A train is running at a speed of 90 km/h. It crosses a bridge of 600 m in 1 min. What would be the length of the train?

- 900 m
- 1200 m
- 1500 m
- 1800 m

10. Which of the following can be found in viruses?

- I. Protein coat
- II. DNA
- III. Mitochondria

- a II and III
- b I and II
- c I, II and III
- d Only III

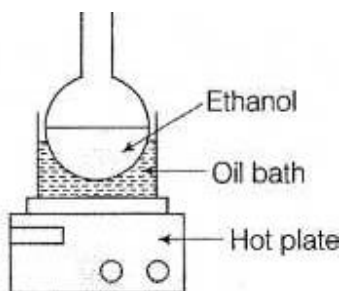
11. The nucleus of both plant and animal cells contain one or more dense bodies known as nucleolus. Which of the following is correct about nucleolus?

- A. The formation of new DNA molecules.
- B. The organisation of the spindle during nuclear division.
- C. The replication of mitochondria following nuclear division.
- D. The formation of ribosomes.
- E. It is dense, spherical and membraneless.

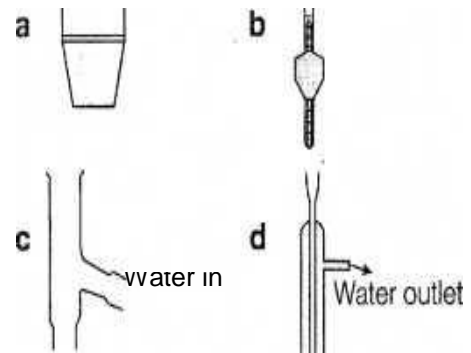
Mark the correct option

- a A and B
- b B and C
- c C and D
- d D and E

12. The diagram shows a flask being heated. The flask contains ethanol, which has a boiling point of 78°C. The ethanol needs to boil for several hours with minimal loss due to evaporation



To minimize the loss of ethanol, which device is an appropriate fitting for the flask?



13. A patient is diagnosed with a viral infection. Which of the following treatments has the highest chance of being effective?

- a Penicillin
- b Deoxycycline
- c Tetracycline
- d None of the above

14. _____ is a division of seed producing plants. A seed has an embryo that contains _____ food for its future growth.

The main plant body is _____ which is differentiated into _____, _____ and _____.

- a Spermatophyta, reserve, sporophyte, root, stem, leaves
- b Pteridophyta, additional, saprophyte, rhizoid, stem, flower
- c Bryophyta, nutritional, thallophyte, rhizoid, stem, branch,
- d Spermatophyta, reserve, thallophyte, rhizoid, stem, leaves