CAPT. ZILE SINGH SCHOOL

Fully Centralized **AC School** for Boys & Girls

OLYMPIAD EXAM : CLASS 9TH

Time Duration : 1 Hours **Max. Marks :** 50

1. Fill in the blank :
   A body is imparted motion from rest to move in a straight line. It is then obstructed by an opposite force, then_____.
   (a) the body may necessarily change direction
   (b) the body is sure to slow down
   (c) the body will necessarily continue to move in the same direction at the same speed
   (d) None of the above
2. Fill in the blank:
   Suppose a ball of mass m is thrown vertically upward with an initial speed v, its speed decreases continuously till it becomes zero. Thereafter, the ball begins to fall downward and attains the speed v again before striking the ground. It implies that the magnitude of initial and final momentums of the ball are same. It is an example of _____.
   (a) conservation of energy (b) gravitational force of the Earth
   (c) Newton's third law of motion (d) None of the above
3. Consider the following pairs of substances/ situation :

I. Piece of Teflon on another piece of Teflon.
II. A block of ice on another block of ice.
III. Rubber tyre on a wet road.
IV. Rubber tyre on a dry road.

   The correct sequence of the decreasing order of their magnitude of the coefficient of friction is _____.
   (a) IV, III, II, I (b) IV, III, I, II (c) III, IV, II, I (d) III, IV, I, II
4. Consider the following statements and choose the correct option :

I. When a person carrying a load on his head moves on a horizontal platform, the work done by the coolie against gravity is zero.
II. When a satellite revolves in a circular orbit around the earth, the work done by the gravitational force on the satellite is zero.
III. When a body falls freely under gravity, the work done by gravity is negative.
IV. Work is a scalar quantity.

   (a) III and II are correct (b) II and III are correct (c) Only IV is correct (d) I, II and IV are correct
5. Consider the following statements and choose the correct option :

I. Work done by a centripetal force is always zero.
II. When a body falls, potential energy is converted into kinetic energy.
III. The power of a body is defined as its capacity of doing work.

   (a) I and II are correct (b) II and III are correct (c) I, II and III are correct (d) None of these
6. Which one of the following statements about an atom is not correct?
   (a) Atoms always combine to form molecules.
   (b) Atoms are the basic units from which molecules and ions are formed.
   (c) Atoms are always neutral in nature.
   (d) Atoms aggregate in large numbers to form the matter that we can see, feel and touch.

7. Which of the following statement(s) is/ are correct?

I. Viruses lack enzymes necessary for the generation of energy.

II. Viruses can be cultured in any synthetic medium.

III. Viruses are transmitted from one organism to another by biological vectors only.

(a) Only I (b) Only II (c) I and III (d) I, II and III

8. Which of the following statements is false about xylem?

(a) Xylem consists of tracheids, vessels, parenchyma and vessels.

(b) Tracheids and vessels does not have tubular structure.

(c) Xylem fibres stores food.

(d) Xylem cells have thick walls and are dead.

9. Rutherford's a-ray scattering experiment led to the discovery of the nucleus and to the conclusion that an atom consists of large empty space. Arrange the following steps in a sequence which explains the experiment and also the above-mentioned conclusions:

1. To make out the observations a spherical ZnS screen was placed surrounding the gold foil.
2. The substance which acts as a source of a-particles is taken in a lead container and made to pass through a slit between like-charged positive plates.
3. It was observed that most of the particles passed straight through the gold foil, few were deflected through small angles and very few through large angles. However, very few completely rebounded.
4. A narrow, condensed beam consisting of a-particles is made to bombard on a thin gold foil.

(a) 1, 3, 2, 4 (b) 2, 3, 1, 4 (c) 4, 2, 1, 3 (d) 2, 4, 1, 3

10. If an electron jumps from orbit A to orbit B, it loses energy and if it jumps from C to B it gains energy. Arrange the orbits in the increasing order of distance from the nucleus:

(a) A < B < C (b) C < A < B (c) C < B < A (d) A < C < B

11. Read the following statements and choose the correct option:

Statement 1: Female Anopheles mosquito is a carrier of a pathogen that causes malaria.

Statement 2: Cholera and tuberculosis are diseases caused by virus.

(a) Statement 1 is correct and statement 2 is incorrect

(b) Statement 1 is incorrect and statement 2 is correct

(c) Both the statements are correct

(d) Both the statements are incorrect

12. Which of the following is not a content of a vaccine?

(a) Dead pathogens (b) Living, weakened microorganisms

(c) Toxoids (d) Antibiotics

13. A body 'A' of mass 5 kg on collision exerts a force on another body B of mass 25 kg. The acceleration produced in B is 15 ms^{-2}. Calculate the acceleration (in magnitude) of A:

(a) 75 ms^{-2} (b) 10 ms^{-2} (c) 52 ms^{-2} (d) 5 ms^{-2}

14. Choose the correct option and complete the following sentence:

As it falls, the acceleration of a body dropped from the height equal to that of the radius of the earth, _____.

(a) remains the same (b) decreases

(c) increases (d) initially increases then decreases

15. According to Bohr, when electron jumps from one shell to another:

(a) if it loses energy, it moves away from the nucleus

(b) when it gains energy it moves towards the nucleus

(c) it emits energy in the form of radiations when it moves from higher energy level to lower energy level

(d) it always gains energy in the form of light

16. The distance between two consecutive crests in a wave train produced on a string is 15 cm. If nine complete waves pass through any point per second, calculate the velocity of the wave:

(a) 135 ms^{-1} (b) 1.35 ms^{-1} (c) 59 ms^{-1} (d) 2.22 ms^{-1}

17. Consider the following statements and choose the correct option :
Statement 1 : Mitochondria is the cell organelles which liberate heat for the maintenance of constant body temperature in birds and mammals.
Statement 2 : The viscous fluid present in the nucleus is called cytoplasm.
(a) Statement 1 is correct and statement 2 is incorrect
(b) Statement 1 is incorrect and statement 2 is correct
(c) Both the statements are correct
(d) Both the statements are incorrect

18. Read the following statements and choose the correct option :
Statement 1 : Growth and repair of damaged tissue involve mitotic cell division only.
Statement 2 : Muscular tissues in animals transports hormones and heat and maintains water balance.
(a) Statement 1 is correct and statement 2 is incorrect.
(b) Statement 1 is incorrect and statement 2 is correct.
(c) Both the statements are correct.
(d) Both the statements are incorrect.

19. In the following question, an assertion and reason are given. Choose the correct option :
Assertion : Materials are exchanged between epithelial and connective tissues by diffusion.
Reason : Blood vessels are usually absent in epithelial tissue.
(a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true and reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d)Both assertion and reason are false.

20. Which of the following is/ are the feature(s) of Phylum Mollusca?
1. Muscular foot
2. Soft unsegmented body
3. Calcareous shell
4. Jointed legs
(a) 1 only (b) 1 and 2 only (c) 1, 2 and 3 only (d) 1, 2, 3 and 4

21. Identify the set of bacterial diseases :
(a) Amoebic dysentery, typhoid, anthrax (b) Elephantiasis, mumps, poliomyelitis
(c) Diphtheria, leprosy, tetanus (d) Typhoid, chickenpox, measles

22. Which of the following is the correct for the phenomenon of sea breeze?
(a) It occur during night.
(b) Air moves from land to sea.
(c) During the day, air above land is warmer than air above water.
(d) During the day, air above water is warmer than air above land.

23. Which of the following is/are not the viral disease(s) of cattle?
1. Foot and mouth disease
2. Anthrax
3. Aspergillosis
4. Tuberculosis
(a) Only 1 (b) Only 3 (c) Both 1 and 3 (d) 2, 3 and 4

24. Choose the correct option and complete the following sentence :
Poultry farming is undertaken to raise the _____.
(i) chicken meat
(ii) milk production
(iii) egg production
(iv) feather production
(a) (i) and (iii) (b) (ii) and (iii) (c) (i) and (iv) (d) (ii) and (iv)

25. In the following question, an assertion and reason are given. Choose the correct option:
Assertion: To replenish the lost nutrients in the soil, quick-acting, handy nutrients are applied in the form of fertilisers.
Reason: Chemical fertiliser contains the necessary plants' nutrients.
(a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true and reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Both assertion and reason are false.

26. Which of the following statements is correct for gases?
1. Mass of the gas cannot be determined by weighing a container in which it is enclosed alone.
2. Gases have a definite shape and volume.
3. The volume of the gas is equal to the volume of the container confining the gas.
4. Confined gas exerts uniform pressure on the walls of the container in all directions.

(a) Only 1 (b) Both 1 and 2 (c) Both 3 and 4 (d) 2, 3 and 4

27. Gases have high diffusibility.
Which of the following is the reason for the above statement?
(a) It is due to the high intermolecular forces of attraction.
(b) It is due to the high kinetic energy of molecules.
(c) It is due to the restricted translatory motion in upward direction.
(d) All of the above

28. In the following question, an assertion and the reason are given. Choose the correct option:
Assertion : Both 44 g CO_2 and 16 g CH_4 have the same number of carbon atoms.
Reason: Both contains 1 g atom of carbon which contains 6.023 x 10^{23} carbon atoms.
(a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true and reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Both assertion and reason are false.

29. Consider the following statements and choose the correct option :
Statement 1: Isotopes have the same mass number and isobars have the same atomic number.
Statement 2: The valency of an element is the mass of the element displacing 1 part by the mass of hydrogen.
(a) Statement 1 is correct and statement 2 is incorrect
(b) Statement 1 is incorrect and statement 2 is correct
(c) Both the statements are correct
(d) Both the statements are incorrect

30. A 240 m long train is moving with a uniform velocity of 55 km/h. The time taken by the train to cross a bridge of length 1.5 km is:
(a) 190.6 s (b) 120.9 s (c) 113.9 s (d) 130.5 s

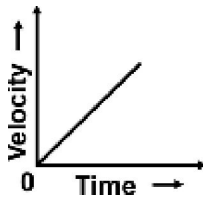
31. In the following question, an assertion and the reason are given. Choose the correct option:
Assertion: Friction can occur only between two surfaces that are moving relative to each other.
Reason: Friction does not oppose the relative motion between two surfaces in contact.
(a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true and reason is not the correct explanation of assertion.
(c) Assertion is true but the reason is false.
(d) Both assertion and reason are false.

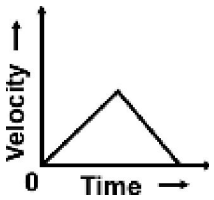
32. A horse runs on a circular track of length 720 metres in 20 seconds and returns to the starting point. Calculate the average velocity:
(a) 36 m/s (b) 0 m/s (c) 18 m/s (d) 72 m/s

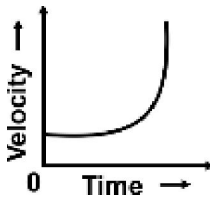
33. Two persons start running towards each other from two points which are 120 m apart. First person runs with a speed of 5 ms^{-1} and the other with a speed of 7 ms^{-1} Both the persons will meet after how much time?

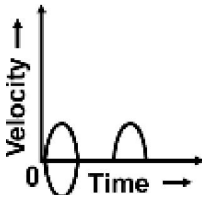
(a) 10 s (b) 24 s (c) 1 min (d) 48 s

34. A body is weighed at the poles and then at the equator. Which of the following statement about the weight is correct?
    (a) The weight at the equator will be greater than at the poles.
    (b) The weight at the poles will be greater than at the equator.
    (c) The weight at the poles will be equal to the weight at the equator.
    (d) The weight depends upon the shape of the object.
35. Choose the correct option and complete the following sentence:
    According to Kepler's second law, the speed of the planet is _____, when it is closest to the sun and is _____, when it is farthest from the sun.
    (a) maximum, minimum (b) minimum, maximum (c) zero, infinity (d) infinity, zero
36. A certain weight is attached with a spring. It is pulled down and then released. It oscillates up and down. What will happen to its kinetic energy?
    (a) It will be maximum in the middle of the movement.
    (b) It will be maximum at the bottom.
    (c) It will be maximum just before it is released.
    (d) It will be constant.
37. What happens when a cannon is fired on the surface of the moon?
    (a) The sound will be heard at the surface of the earth during all seasons.
    (b) The sound will not be heard at the surface of the earth but will be heard on the moon.
    (c) The sound will be heard at the surface of the earth during the rainy seasons.
    (d) No sound will be heard on the earth or on the moon.
38. Lichens are important in studies on atmospheric pollution. Which of the following is the correct reason for the above-given statement?
    (a) It is because lichens can also grow in greatly polluted atmosphere.
    (b) It is because lichens can readily multiply in polluted atmosphere.
    (c) It is because lichens are very sensitive to pollutants like SO_2.
    (d) It is because lichens efficiently purify the atmosphere.
39. A man fired a bullet against a wall and hears an echo after 2 s. He walks 80 m towards the wall and fired bullet, such that he hears echo after 1 s. Find the distance from wall to the second fired place:
    (a) 80 m (b) 120 m (c) 40 m (d) 160 m
40. Which one of the following curves do not represent motion in one dimension?

(a) 

(b) 

(c) 

(d) 

41. Consider the following statements :
I. A slipper-shaped animal is Paramecium.
II. Amoeba has a definite shape.
III. Malaria parasite and Amoeba are grouped under Protozoa.
IV. Euglena is also known as green Protozoa.
    Which of the statements given above are correct?
    (a) I and II (b) I, III and IV (c) I, II, III and IV (d) None of these
42. In the following question, an assertion and a reason are given. Choose the correct option :

Assertion (A): Electrons present in ground states of different single electron species (H, He^+, Li^{++}) possess the same amount of energy.

Reason (R): Distances of electrons from the nuclei of different single electron species are equal.

(a) Both A and R are correct and R is the correct explanation of A

(b) Both A and R are correct and R is the not the correct explanation of A

(c) A is correct and R is wrong

(d) Both A and R are wrong

43. Two bodies, initially separated by x m and having an initial velocity 2 ms^{-1} each, are moving towards each other along a straight line. If the rate of increases in their speeds is 3 ms^{-2} and 2 ms^{-2} respectively and the two meets after 4 seconds, find x :

(a) 45 m (b) 23 m (c) 36 m (d) 56 m

44. Two persons having mass 50 kg each, are standing such that their centre of gravity are 1 m apart. Calculate the force of gravitation and also calculate the force of gravity on each. (Take G = 6.67×10^{-11} N m^2 kg^{-2}, mass of earth M = 6×10^{24} kg, Radius of earth R = 6.4×10^6 m)

(a) 1.67×10^{-7} N, 0.50×10^3 N (b) 1.67×10^{-7} N, 0.48×10^3 N

(c) 3.9×10^{-7} N, 0.18×10^3 N (d) 4.0×10^{-7} N, 0.20×10^3 N

45. In the following question, an assertion and a reason are given. Choose the correct option :

Assertion: A piece of ice floats in water. The level of water remains unchanged when the ice melts completely.

Reason: According to the Archimedes' principle, the loss in weight of a body in the liquid is equal to the weight of the liquid displaced by immersed part of the body.

(a) Both assertion and reason are correct and reason is the correct explanation of the assertion.

(b) Both assertion and reason are correct and reason is not the correct explanation of the assertion.

(c) Assertion is correct, but reason is incorrect.

(d) Assertion is incorrect, but reason is correct.

46. In the following question, an assertion and the reason are given. Choose the correct option :

Assertion: Excess use of fertilisers causes salt loading of soil.

Reason: Fertilisers may develop alkalinity in the soil.

(a) Both assertion and reason are true and reason is the correct explanation of assertion.

(b) Both assertion and reason are true and reason is not the correct explanation of assertion.

(c) Assertion is true but reason is false.

(d) Both assertion and reason are false.

47. Match the following:

Column I		Column II	
(A)	Mitochondria	(i)	Harness sunlight
(B)	Ribosome	(ii)	Food storage
(C)	Emdoplasmic reticulum	(iii)	Cellular respiration
(D)	Choroplast	(iv)	Intracellular transport
(E)	Leucoplast	(v)	RNA

(a) A-iii, B-v, C-iv, D-i, E-ii (b) A-iv, B-v, C-iii, D-i, E-ii

(c) A-v, B-iv, C-iii, D-i, E-ii (d) A-ii, B-v, C-iv, D-i, E-iii

48. Match the entries of Column I with those of Column II :

Column I		Column II	
(A)	Archeopteryx	(i)	Electric organ
(B)	Cyclostoma	(ii)	Fossil birds
(C)	Mammals	(iii)	Dual habitat
(D)	Torpedo	(iv)	Jawless vertebrates
(E)	Amphibia	(v)	Mammary gland

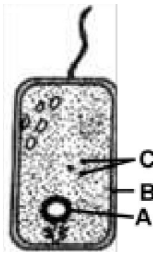
(a) A-(ii), B-(iv), C-(v), D-(i), E-(iii)
(b) A-(ii), B-(iii), C-(v), D-(i), E-(iv)
(c) A-(v), B-(iii), C-(ii), D-(i), E-(iv)
(d) A-(ii), B-(iii), C-(v), D-(i), E-(iv)

49. Match the following :

Column I		Column II	
(A)	Cytoplasm	(i)	Jelly like substance
(B)	Lysosmes	(ii)	Powerhouse of the cell
(C)	Mitochondria	(iii)	Site of protein synthesis
(D)	Ribosomes	(iv)	Synthesis of lipids
(E)	Endoplasmic reticulum	(v)	Suicide bags

(a) (A)-(i), (B)-(v), (C)-(ii), (D)-(iv), (E)-(iii)
(b) (A)-(i), (B)-(iv), (C)-(ii), (D)-(v), (E)-(iii)
(c) (A)-(i), (B)-(v), (C)-(ii), (D)-(iii), (E)-(iv)
(d) (A)-(iv), (B)-(v), (C)-(ii), (D)-(i), (E)-(iii)

50. Identify A, B, C in the following diagram:



(a) A-DNA, B-Cell wall, C-Food reverse
(b)A-Cell wall, B-Plasma membrane, CPlastid
(c) A-Plastid, B-Plasma membrane, CCytoplasm
(d) A-Food reserve, B-Cell wall, CRibosome