

Bloom School Olympiads

Bloom Science Olympiad (BSO)

Class 9th

Question Paper 2022

Student Name _____

Mobile No. _____

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Total Questions : 50

Time : 60 min.

Instructions

1. Additional 10 min. will be given to students to fill up the student's information before the start of the exam.
2. There are two sections, Section A & Section B. **Section A** has 40 questions of 1 mark each and **Section B** has 10 questions of 2 mark each.
3. All questions are compulsory. Use of calculator is not allowed.
4. Write and circle your Roll Number and Subject clearly on the Answer sheet and do not forget to sign.
5. There is only one correct answer hence mark one choice only.
6. Darken your choice with HB Pencil or Blue/Black Ball Point Pen only.

For example

Indira Gandhi International Airport, is situated in which city?

- | | |
|---------------|---------------|
| (a) New Delhi | (b) Mumbai |
| (c) Chennai | (d) Hyderabad |

20: ☒ (a) ☐ (b) ☐ (c) ☐ (d)

As the correct answer is (a), the student should darken the circle corresponding to option (a)

7. Rough work should be done in the blank space provided in the booklet
8. Return the answer sheet to the exam in-charge teacher at the end of the exam.

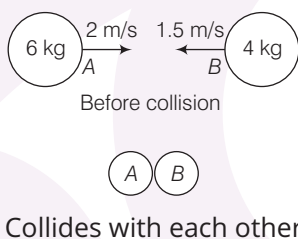
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Bloom Science Olympiad Class 9

Section A (1 Mark)

1. What is the density of oxygen in g L^{-1} ? ($m = 0.357 \text{ g}$, $V = 249.999 \text{ mL}$)
(a) 0.867 (b) 1.157 (c) 1.433 (d) 1.513
2. The formula of chloride of a metal M is MCl_3 , then the formula of the phosphate of metal M will be
(a) MPO_4 (b) M_2PO_4 (c) M_3PO_4 (d) $\text{M}_2(\text{PO}_4)_3$
3. Organelles other than nucleus containing DNA is
A. endoplasmic reticulum B. Golgi apparatus
C. mitochondria D. chloroplast
- Codes**
(a) A and B (b) B and C (c) C and D (d) A and C
4. The name of genus starts with a ____ letter and the species name starts with ____ letter.
(a) capital, capital (b) small, capital (c) capital, small (d) small, small
5. Study the figure given below:



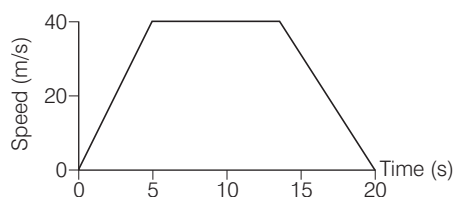
- What will be the velocity of the combination?
(a) 0.4 m/s (b) 0.2 m/s (c) 0.1 m/s (d) 0.6 m/s
6. Choose the set which is not correctly matched.
(a) Sublimation-Camphor from salt (b) Chromatography-Drugs from blood
(c) Crystallisation-Salt from sea (d) Separating funnel-Cream from milk
7. Name of some species are given below:



These species have

- (a) same mass number but different atomic number.
(b) same atomic number but different mass number.
(c) same value of (mass number – atomic number).
(d) same number of electrons.

8. Which of the following helps in repair of tissue and fills up the space inside the organ?
 (a) Tendon (b) Adipose tissue (c) Areolar (d) Cartilage
9. The speed of a body during 20 s of motion is represented by the speed-time graph shown.

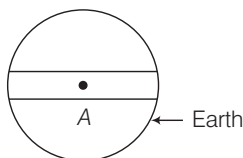


What distance does the body travel during this motion?

- (a) 300 m (b) 400 m (c) 500 m (d) 600 m
10. An apple falls from a tree because of gravitational force of attraction F_1 between the earth and apple. If F_2 is the magnitude of force exerted by apple on the earth, then
 (a) $F_1 \gg F_2$ (b) $F_2 \gg F_1$ (c) $F_1 > F_2$ (d) $F_1 = F_2$
11. Which diagram represents the arrangement of particles in a gas?

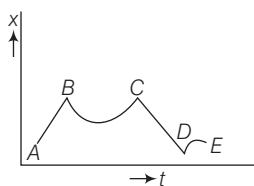


12. The mass of nitrogen per gram hydrogen in the compound hydrazine is exactly one and half times the mass of nitrogen in the compound ammonia. This fact illustrates the
 (a) law of conservation of mass. (b) multiple valency of nitrogen.
 (c) law of multiple proportions. (d) law of definite proportions.
13. Which of the cell organelle take part in the formation of acrosome?
 (a) Nucleus (b) Chromosome
 (c) Golgi complex (d) Mitochondria
14. The weight of a body is the force with which a body is attracted by the earth towards its centre. What is the weight of an object at the point A shown in figure?



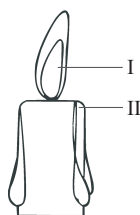
- (a) Zero
 (b) Infinite
 (c) R times the weight at the surface of the Earth
 (d) $1/R^2$ times the weight at the surface of the Earth

15. Figure shows the displacement of a particle going along the X-axis as function of time. The force acting on the particle is zero in the region.



- (a) AB (b) BC (c) CE (d) DE

16. Burning of a candle is shown below:



What type of change takes place at place II?

- (a) Physical (b) Chemical
(c) Both (a) and (b) (d) None of these

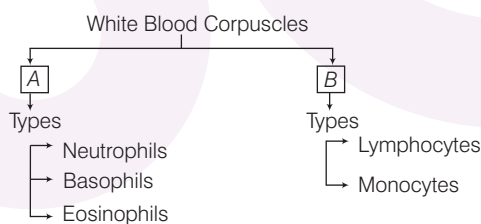
17. Consider the following electronic configurations.

- I. Be (3) = 2, 1 II. O (8) = 2, 6
III. S (16) = 2, 6, 8 IV. P (15) = 2, 8, 5

The incorrect configuration(s) among the above is/are

- (a) I and II (b) II and IV (c) Only III (d) Only I

18. Complete the following flow chart.



Identify A and B from the options given below

- | A | B |
|-------------------|---------------|
| (a) Erythrocytes | Leucocytes |
| (b) Granulocytes | Agranulocytes |
| (c) Granulocytes | Agranulocytes |
| (d) Agranulophils | Granulocytes |

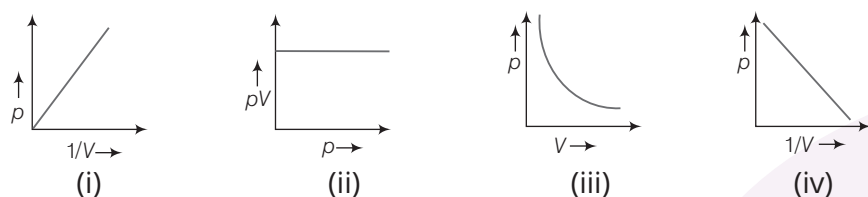
19. A stone is thrown upwards with a speed u from the top of a tower. It reaches the ground with a velocity $2u$. The height of the tower is

- (a) $\frac{u^2}{2g}$ (b) $\frac{3u^2}{2g}$ (c) $\frac{2u^2}{g}$ (d) $\frac{4u^2}{g}$

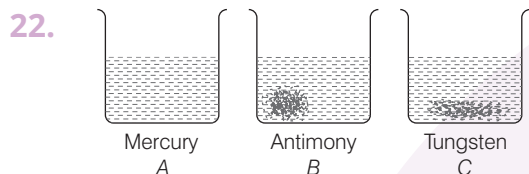
20. Which of the forces is not responsible for the flow of water in rivers?

- I. Frictional forces II. Gravitational forces
III. Electrical forces IV. Magnetic forces
(a) I and II (b) III and IV
(c) I, II and III (d) I, III and IV

21. Which of the following graphs represent(s) the correct Boyle's law?



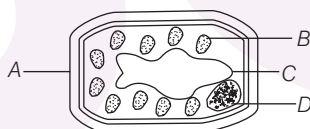
- (a) (i), (ii) and (iii) (b) (i) and (iv)
(c) (ii) and (iii) (d) (i), (ii) and (iv)



The elements present in the above three containers A, B and C are represented as

- (a) Mr, At, Tn (b) Hg, Sb, W (c) Hg, At, Tn (d) Hg, Sb, Wo

23. Look at the plant cell below carefully.



Which part of the above plant cell functions like bones of animals supporting it and giving its shape?

- (a) A (b) B (c) C (d) D

24. Which among the following have open circulatory system?

- I. Arthropoda II. Mollusca III. Annelida IV. Coelenterata
(a) I and III (b) III and IV (c) I and II (d) II and IV

25. Name the law in which sum of product of masses and velocities of two moving bodies before and after their collision remains constant.

- (a) conservation of energy (b) conservation of velocity
(c) conservation of forces (d) conservation of momentum

26. Consider the following statements.

- I. Most of the elements are solids.
- II. Mercury and bromine are the only two liquid elements.
- III. Gallium and caesium are liquid metals.

The true statement(s) is/are

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

27. While performing cathode ray experiments, it was observed that there was no passage of electric current under normal conditions.

Which of the following can account for this observation?

- (a) Dust particles are present in air
- (b) Carbon dioxide is present in air
- (c) Air is a poor conductor of electricity under normal conditions
- (d) None of the above

28. If the tip of sugarcane plant is removed from the field, even then it keeps on growing in length. Which part of the plant is responsible for this? Select the correct option.

- (a) Cambium
- (b) Apical meristem
- (c) Lateral meristem
- (d) Intercalary meristem

29. An object is pushed along a horizontal surface in such a way that it starts with a velocity of 36 km/h and decreases at the rate of 0.5 m/s^2 . The time it will take to come to rest, is



- (a) 40 s
- (b) 20 s
- (c) 10 s
- (d) 5 s

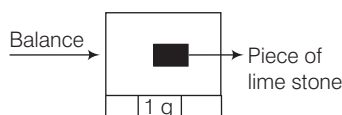
30. Communication satellites move in the orbits of radius 44400 km around the Earth. Assuming that the only force acting on it is due to then acceleration of the satellite is ($M_e = 6 \times 10^{24} \text{ kg}$)

- (a) 0.4 ms^{-2}
- (b) 0.6 ms^{-2}
- (c) 0.2 ms^{-2}
- (d) 0.1 ms^{-2}

31. According to Graham's law at a given temperature, the ratio of the rates of diffusion r_A / r_B of gases A and B is given by

- (a) $(p_A / p_B)(M_B / M_A)^{1/2}$
- (b) $(M_A / M_B)(p_A / p_B)^{1/2}$
- (c) $(p_B / M_B)(p_A / M_A)^{1/2}$
- (d) $(M_A / M_B)(p_B / p_A)^{1/2}$

32. Seema takes a small piece of lime stone and weigh it.



The number of carbon atoms present in this piece of lime stone is

- (a) 6.022×10^{23}
- (b) 6.022×10^{21}
- (c) 3.0125×10^{22}
- (d) 1.204×10^{23}

33. In which of the following endoplasmic reticulum is absent?

- (a) Cell of pancreas and salivary gland
 (b) Erythrocytes of mammals and prokaryotes
 (c) Cell of brain
 (d) Nephrons
34. Vanadium is a transition element. Its atomic number and mass number are respectively 92 and 235. The ratio of neutron to proton in this element is
 (a) 1.52 (b) 1.33
 (c) 1.55 (d) 1.42
35. A man is drawing a bucket of water out of well. Suddenly, bucket falls back when the rope snaps. This is because of
 (a) law of gravitation. (b) first law of motion.
 (c) Newton's second law of motion. (d) Newton's third law of motion.
36. The size of particles of colloidal solution is in the range of
 (a) 1-100 nm (b) 100-1000 nm (c) 10^{-5} - 10^{-7} m (d) 10^7 - 10^9 m
37. An element X is converted into its positive ion as $X \longrightarrow X^{3+}$. Mass number of the atom is 27 and the number of neutrons is 14. What is the number of electrons in the ion?
 (a) 13 (b) 10 (c) 14 (d) 16
38. The xylem tubes in the plants help to transport
 (a) water and mineral salts from the roots to the leaves.
 (b) water and mineral salts from the leaves to the roots.
 (c) food from the roots to the leaves.
 (d) food from the leaves to all parts of the plant.
39. Two scooters starting from rest accelerate uniformly at the same rate. The second scooter travels twice the time of the first scooter. Then, the relation between the distance covered by the first scooter (s_1) to that of second scooter (s_2) is
 (a) $s_1 = s_2$ (b) $s_1 = 2s_2$ (c) $s_2 = 3s_1$ (d) $s_2 = 4s_1$
40. If the radius of the Earth shrinks by 4% and there is no change in its mass, then acceleration due to gravity, which depends on mass and radius will change. By how much does the value of g change?
 (a) 2% (b) 4% (c) 16% (d) 8%

Section B (2 Marks)

41. State 'T' for true or 'F' for false and choose the correct option.
 I. Diamond as well as methane both are considered as pure substances.
 II. Out of 118 elements known today, 92 are natural elements.
 III. Elements are always metallic in nature and no pure elements are liquid at room temperature.
 IV. In a compound, elements combine in definite proportion.
 V. Osmium has the highest density whereas, tungsten has the lowest melting point.

VI. Robert Boyle gave the first definition of element.

	I	II	III	IV	V	VI
(a)	F	F	F	T	T	F
(b)	T	T	F	T	F	T
(c)	T	F	T	F	T	F
(d)	F	T	T	F	F	T

42. Assertion (A) In CO molecule, 12 parts by mass of carbon combine with 16 parts by mass of oxygen and in CO₂, 12 parts by mass of carbon combine with 32 parts by mass of oxygen.

Reason (R) When two elements combine separately with a fixed mass of a third element, then the ratio of their masses in which they do so, is either the same or whole number multiple of the ratio in which they combine with each other.

- (a) Both A and R are true and R is the correct explanation of A
- (b) Both A and R are true, but R is not the correct explanation of A
- (c) A is true, but R is false
- (d) R is true, but A is false

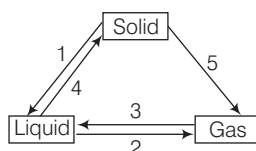
43. Match the following columns.

Column I	Column II
A. Cell	1. Leaf
B. Organ	2. Heart
C. Tissue	3. Skeleton
D. Organ system	4. Root hair
E. Organism	5. Spongy mesophyll
	6. Worm
	7. Kidney
	8. Xylem

Codes

	A	B	C	D	E
(a)	5	1, 2, 7	4, 8	3	6
(b)	3	2, 7	1, 6	4	5, 8
(c)	1	2, 6	3, 7	4	5, 8
(d)	8	7, 1	3, 6	5	4, 2

44. The diagram shows some of the changes of state.



Which statement is correct about the diagram?

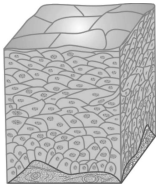
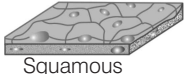
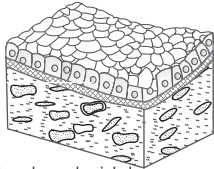
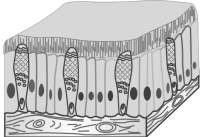
- (a) Although, the change is not shown on the diagram, a gas can change directly to a solid.
- (b) The changes 1 and 3 involve particles moving close together.
- (c) The changes 2 and 4 involve particles moving further apart.
- (d) The changes 3, 4 and 5 all involve the release of energy.

45. Assertion (A) The motion of the earth around the Sun once every year requires some force of attraction between them.

Reason (R) The centripetal force acting between Sun and Earth is the gravitational force between them.

- (a) Both A and R are true and R is the correct explanation of A
- (b) Both A and R are true, but R is not the correct explanation of A
- (c) A is true, but R is false
- (d) Both A and R are false

46. Match the following columns.

Column A		Column B	
P.	 Stratified squamous	I.	Forms a delicate lining, e.g. skin, in oesophagus, lining of mouth, blood vessels and lung alveoli.
Q.	 Squamous	II.	Have rounded nuclei, forms lining of kidney tubules and ducts of salivary glands.
R.	 Simple cuboidal epithelium	III.	Have elongated nuclei, found in inner lining of intestine.
S.	 Columnar (ciliated)	IV.	Arranged in pattern of multiple layers in skin.

	P	Q	R	S		P	Q	R	S
(a)	IV	I	II	III	(b)	IV	II	III	I
(c)	II	III	I	IV	(d)	I	III	IV	II

47. Read the following paragraph and fill in the blank with appropriate words.

An object moves with a uniform velocity when the forces acting on the object are _____ and there is no _____ acting on it. If an unbalanced force is applied on the object there will be a change either in its _____ or in the _____ of its motion. Thus, to accelerate the motion of an object, an _____ force is required

- (a) balanced, external force, speed, direction, unbalanced.
- (b) unbalanced, external force, acceleration, direction, unbalanced.
- (c) unbalanced, pressure, speed, position, balanced.
- (d) balanced, pressure, acceleration, position, balanced.

Direction (Ques. 48-50) *Read the following passage carefully and answer the questions that follow:*

Biodiversity refers to the forms of living beings which differ from one another in external appearance, size, colour, pattern, internal structure, nutrition, behaviour habitat, etc.

There are about 1.8 million organisms, all of which are different from one another. They range in size from microscopic bacteria to a giant structured blue whale. There are transparent jelly fish and worms on one hand to brightly coloured birds and flowers on the other hand. The diversity is not only present amongst different organisms but also individuals of the same organism. Thus, to arrange all these vast diversity of organisms, scientists classify them and distribute them in different kingdom, phylum, class etc on the basis of their various characteristics.

48. An area which is extremely rich in biodiversity is the warm and humid tropical region. These centres of huge and rich biodiversity are termed as
- (a) megadiversity centre
 - (b) rich diversity centre
 - (c) macrodiversity centre
 - (d) huge diversity centre
49. A system of arranging taxonomic categories in a descending order on the basis of their relative dimension is called It was introduced by
- (a) hierarchy of categories; Linnaeus
 - (b) hierarchy of livings; Darwin
 - (c) hierarchy of diversity; Lamarck
 - (d) hierarchy of biodiversity; Linnaeus
50. What is the major cellular characteristic on the basis of which plants and animals are categorised in two different kingdoms?
- (a) The presence of cell wall and plastids in plants.
 - (b) The presence of vacuoles and plasma membrane.
 - (c) The presence of nucleus and nucleolus.
 - (d) The presence of food vacuoles.

ANSWER KEY

Science Class 9th

1.	(c)	18.	(c)	35.	(d)
2.	(a)	19.	(b)	36.	(a)
3.	(c)	20.	(d)	37.	(b)
4.	(c)	21.	(a)	38.	(b)
5.	(d)	22.	(b)	39.	(d)
6.	(d)	23.	(a)	40.	(d)
7.	(c)	24.	(c)	41.	(b)
8.	(c)	25.	(d)	42.	(b)
9.	(d)	26.	(a)	43.	(a)
10.	(d)	27.	(c)	44.	(a)
11.	(a)	28.	(d)	45.	(a)
12.	(c)	29.	(b)	46.	(a)
13.	(c)	30.	(c)	47.	(a)
14.	(a)	31.	(a)	48.	(a)
15.	(a)	32.	(b)	49.	(a)
16.	(a)	33.	(b)	50.	(a)
17.	(c)	34.	(c)		

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Olympiad

BSO

Bloom
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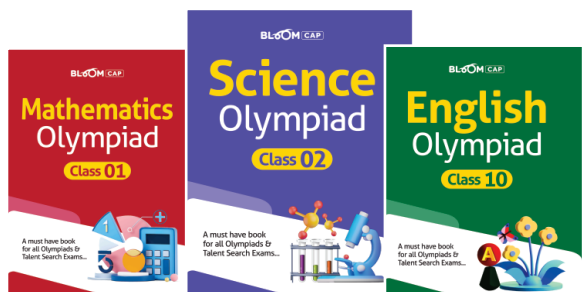
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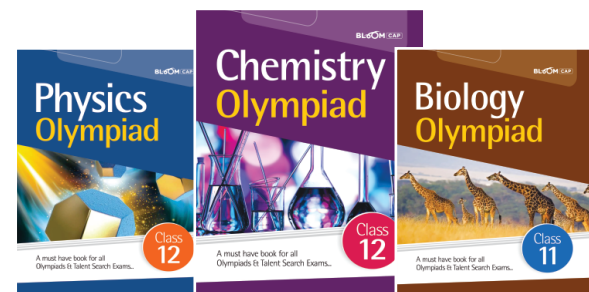
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