Grade 8

CREST Science Olympiad (CSO)

Sample Paper

Pattern and Marking Scheme				
Grade	**Topic/Section**	**No. of Questions**	**Marks per Question**	**Total Marks**
Grade 8	Practical Science	40	1	40
	Achiever's Section	10	2	20
Grand Total		**50**		**60**

The total duration of the exam is 60 minutes.

Syllabus

Section 1: Crop Production and Management, Microorganisms, Synthetic Fibres and Plastics, Metals and Non-metals, Coal and Petroleum, Combustion and Flame, Conservation of Plants and Animals, Cell, Reproduction and Endocrine System, Force and Pressure, Friction, Sound, Chemical Effects of Electric Current, Some Natural Phenomena, Light, Stars and the Solar System, Pollution of Air and Water.

Achievers Section: Higher Order Thinking Questions - Syllabus as per Section 1

For more details, visit https://www.crestolympiads.com/science-olympiad-cso

Practical Science (Each Question is 1 Mark)

1. Fill in the blank:
For showing the full image of an object, the size of the plane mirror should be at least _____.

a. two times of the object
b. 1/2 of the object
c. 1/4th of the object
d. 1/3rd of the object

2. Identify the element as per following statement:
An element reacts with oxygen to give a compound with a high melting point. This compound is also soluble in water.

a. Calcium
b. Carbon
c. Silicon
d. Iron

3. Consider the following statements about the physical and chemical properties of metals and choose the correct option:
1. All metals are ductile.
2. Generally, metals are ductile.
3. Metals which are more reactive than hydrogen react with acids to release hydrogen gas.
4. All metals react with acids to release hydrogen gas.

a. Only 1 and 2 are correct
b. Only 2 and 3 are correct
c. 1, 2 and 3 correct
d. 1, 2, 3 and 4 are correct

4. Which of the following poisonous gases is produced when a fuel burns in an insufficient supply of oxygen?
1. Sulphur dioxide
2. Nitrogen dioxide
3. Carbon monoxide
4. Coal gas

a. Only 1
b. Only 2
c. Only 3
d. Both 2 and 4

5. Select the incorrect statement:

a. Plant cells are surrounded by a living, rigid outer layer called cell wall.
b. The plant cell wall is made up of cellulose.
c. The bacterial cell wall is made up of peptidoglycan.
d. Both prokaryotic and eukaryotic plasma membranes are composed of lipids and proteins.

6. What happens in the following reaction?
$Fe_2O_3 + 3C \rightarrow 2Fe + 3CO$

a. Fe undergoes oxidation and C undergoes reduction
b. Fe undergoes reduction and C undergoes oxidation

c. Both Fe and C undergo reduction
d. Both Fe and C undergo oxidation

7. Arrange the different types of coal in the decreasing order of the quality of coal:
1. Lignite
2. Peat
3. Anthracite
4. Bituminous

a. 3, 4, 1, 2
b. 4, 2, 3, 1
c. 2, 1, 4, 3
d. 2, 3, 4, 1

8. The sound produced by a tuning fork travel from air to glass. Which of the following physical quantities remains the same?
1. Velocity
2. Frequency
3. Wavelength
4. Amplitude

a. Only 1
b. Only 2
c. Both 1 and 3
d. Both 2 and 4

9. Fill in the blank:
A duster rests on a table, exerting a downward force on the table. The reaction to this force is _____.

a. the force of Earth on the duster
b. the force of the table on the duster
c. the force of Earth on the table
d. the inertia of the duster

10. Susan was walking on ice, her mother advised her to take smaller steps to avoid slipping. Which of the following could be the reason for the smaller steps?

a. The frictional force of ice is large.
b. Normal reaction is larger.
c. The frictional force of ice is small.
d. Normal reaction is smaller.

11. The pressure at a certain depth in river water is p_1 and at the same depth the pressure in seawater is p_2. Given that the density of seawater is greater than that of river water. Identify the correct relation between p_1 and p_2:

a. $p_1 = p_2$
b. $p_1 > p_2$
c. $p_1 < p_2$
d. $p_1 - p_2$ = Atmospheric pressure

12. In the given question, an assertion and reason are given. Choose the correct option:
Assertion: Animals like camels walk easily in deserts as broad feet exert less pressure on sandy ground.
Reason: Pressure decreases with an increase in surface area.

a. Both assertion and reason are CORRECT and reason is the CORRECT explanation of the assertion

b. Both assertion and reason are CORRECT, but 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

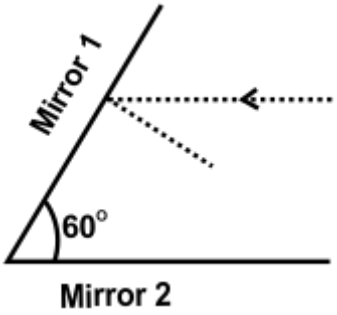
13. An echo returned in 3 s. What is the distance of the reflecting surface from the source, given that the speed of sound is 342 m s^{-1}?

a. 520 m
b. 515 m
c. 530 m
d. 513 m

14. Ron placed an object at a distance 2 m from a plane mirror. He then shifted the object 0.5 m away from the mirror. What is the distance between the object and its image?

a. 2 m
b. 1.5 m
c. 5 m
d. 3 m

15. Which of the following devices do not use the magnetic effect of electric current?



a. 5
b. 6
c. 7
d. 8

16. Choose the correct option and complete the following sentence:
A lightning conductor installed in a building _____.

a. does not allow the lightning to fall on the building
b. repels the lightning
c. forces the lightning to fall in an area where there are no buildings
d. conducts electric charge to the ground when lightning strikes the building

17. In the following question, an assertion and reason are given. Choose the correct option:
Assertion: Fungi are a large group of organisms which do not photosynthesise.
Reason: All fungi are generally made up of fine threads called hyphae.

a. Both assertion and reason are true and reason is the correct explanation for the assertion
b. Both assertion and reason are true but reason is not the correct explanation for the assertion
c. Assertion is true but reason is false
d. Assertion is false but reason is true

18. Which of the following statement(s) is not correct?

a. In a plant cell, vacuoles are absent.
b. A vacuole is bounded by a single membrane.
c. In Amoeba, contractile vacuole is important for excretion.
d. The flagellum is important for the transport of bacteria.

19. What benefit does yeast gain from carrying out fermentation?

a. Carbon dioxide is available for photosynthesis.
b. Energy is available for growth.
c. Ethanol is available for growth.
d. Glucose is available for respiration.

20. Identify the group(s) which contain all synthetic substances:

P	Nylon, Terylene, Wool
Q	Acrylic, Silk, Wool
R	Cotton, Polycot, Rayon
S	PVC, Polythene, Bakelite

a. P only
b. Q only
c. S only
d. Both P and S

21. Which of the following is correct definition of ignition temperature?

a. The lowest temperature at which a substance catches fire spontaneously.
b. The lowest temperature at which a substance catches fire.
c. The lowest temperature at which a substance changes its physical state.
d. The lowest temperature required for a chemical reaction to take place.

22. Why is just one side of the Moon visible from Earth?

a. The Moon does not rotate on its axis as it orbits Earth.
b. The Moon rotates on its axis at the same rate that the Moon orbits the Earth.
c. Half of the Moon is always unlit by the Sun.
d. Half of the Moon does not reflect light.

23. Fill in the blank:
When an iron nail gets rusted, iron oxide is formed _____.

a. without any change in the weight of the nail
b. with increase in the weight of the nail
c. with decrease in the weight of the nail
d. without any change in colour or weight of the nail

24. Consider the following statements and choose the correct option:
Statement 1: The ignition temperature of white phosphorus is nearly equivalent to the temperature of the earth.

Statement 2: Combustion of fuel by motor vehicles is an example of spontaneous combustion.

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

25. Four classmates were having a discussion about the correct way for sowing seeds. This is what they said:
Richard: Seeds should be sown at right intervals.
Susan: Seeds should be sown at the right depth.
David: Seeds should be sown in dry soil.
Jacob: Seeds should not be sown in highly wet soil.
Which of them was/were incorrect?

a. Only Jacob
b. Only David
c. Both Susan and Richard
d. Both David and Susan

26. Which of the following pairs cannot undergo displacement reaction?

a. Iron sulphate solution and magnesium
b. Zinc sulphate solution and iron
c. Zinc sulphate solution and calcium
d. Silver nitrate solution and copper

27. Which of the following can lead to menstruation in a 21-year-old woman after ovulation?
A. Sperms not available for fertilisation
B. Oviducts blocked
C. Sperms available for fertilisation
D. Oviducts not blocked

a. A and B
b. B and C
c. A and D
d. C and D

28. A plastic comb is rubbed with dry hair whereas a glass rod is rubbed with a piece of silk cloth. Which of these will get positively charged?
A. Plastic comb
B. Glass rod
C. Dry hair
D. Silk cloth

a. A and B
b. B and C
c. A and D
d. B and D

29. Which of the following organelles is only found in the plant cell, but not in the animal cell?

a. Chloroplast
b. Endoplasmic reticulum
c. Mitochondria
d. Ribosome

30. Which of the following problems is not related to our environment?

a. Afforestation
b. Ocean acidification
c. Invasive species
d. Desertification

31. Stars twinkle but planets do not twinkle.
Which of the following is the correct reason for the above-given statement?

a. Stars emit their own light but planets receive light from the stars.
b. Stars do not form a part of the solar system.
c. Stars form a point source of light while planets are considered as a collection of a large number of point sources of light.
d. During refraction of star light from the atmosphere, star light bends more towards the normal as compared to the planets.

32. Which one of the following is the correct sequence of the reactivity order of the elements?

a. Cu > Mg > Zn > Na
b. Na > Zn > Mg > Cu
c. Cu > Zn > Mg > Na
d. Na > Mg > Zn > Cu

33. In heavy vehicles, diesel is used as a fuel. Which of the following could be the reason for this?

a. It has more mileage and is safe for the engine.
b. It is less costly and useful in fuel savings.
c. It has high power and is convenient.
d. It is cheaper in comparison to petrol.

34. Match the column I with column II:

Column I		**Column II**	
1.	Dispersion	a.	Mirage
2.	Scattering	b.	Pinhole camera
3.	Total internal reflection	c.	Red light used as traffic signal
4.	Rectilinear propagation	d.	Rainbow

a. 1 – c, 2 – d, 3 – a, 4 – b
b. 1 – d, 2 – c, 3 – b, 4 – b
c. 1 – a, 2 – c, 3 – b, 4 – d
d. 1 – d, 2 – a, 3 – c, 4 – a

35. An elephant has a mass of 3000 kg. Each of its foot has a surface area of 0.4 m^2. A lady of mass 45 kg wears stiletto shoes. Each of the stiletto heels has a surface area of 0.01 m^2. Assuming there is the equal distribution of mass on each foot.
Calculate the maximum possible pressure that could be exerted by a stiletto heel worn by the lady:

a. 25500 Pa
b. 22500 Pa
c. 52500 Pa
d. 20000 Pa

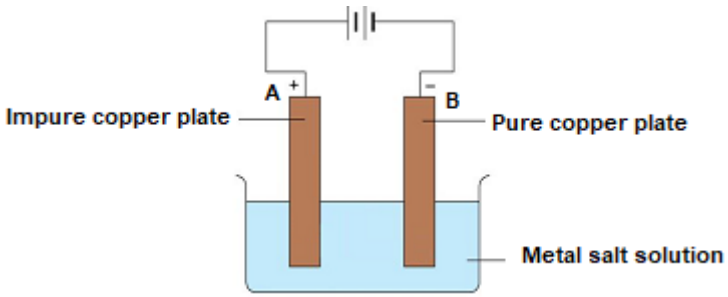
36. Match the Column I with Column II:

Column I		Column II	
1.	Binary fission	a.	Spirogyra
2.	Budding	b.	Yeast
3.	Fragmentation	c.	Low organisms
4.	Vegetative propagation	d.	Aphids
5.	Parthenogenesis	e.	Sugarcane

a. 1 – b, 2 – d, 3 – e, 4 – c, 5 – a
b. 1 – c, 2 – b, 3 – a, 4 – e, 5 – d
c. 1 – e, 2 – c, 3 – d, 4 – a, 5 – b
d. 1 – a, 2 – e, 3 – b, 4 – d, 5 – c

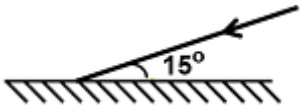
37. The diagram shows the process of purification of copper metal. A thick copper plate A of impure copper and a thin pure copper plate B are immersed in a metal sulphate solution and an electric current is passed through it.

1. Which metal solution is taken as electrolyte?
2. Which electrode is connected to the positive terminal of the battery?



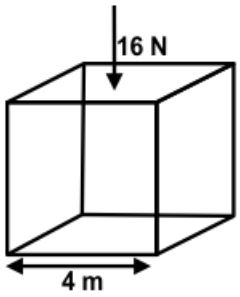
a. 1-Copper sulphate solution
   2-The thick plate of impure copper (Anode)
b. 1-Iron sulphate solution
   2-The thick plate of impure copper (Cathode)
c. 1-Copper sulphate solution
   2-The thin plate of pure copper (Anode)
d. 1-Iron sulphate solution
   2-The thin plate of pure copper (Cathode)

38. When a ray of light strikes a plane mirror at an angle of 15^{o} with the mirror, what will be the angle through which the ray gets deviated?



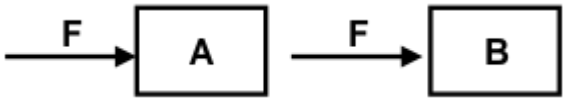
a. 15^{o}
b. 30^{o}
c. 75^{o}
d. None of these

39. A force of 16 N is distributed uniformly on one surface of a cube of edge 4 m. Find the pressure on this surface:



a. 1 Pa
b. 2 Pa
c. 1/2 Pa
d. 3 Pa

40. Fill in the blank:
Equal force F acts on isolated bodies A and B as shown. The mass of B is three times that of A. The magnitude of the acceleration of A is _____.



a. three times that of B
b. 1/3 that of B
c. nine times that of B
d. 1/9 that of B

Achiever's Section (Each Question is 2 Marks)

41. Choose the correct option and complete the following sentence:
The formation of sulphur trioxide from sulphur dioxide and oxygen is an _____ reaction.

a. endothermic as well as redox
b. endothermic as well as precipitation
c. exothermic as well as redox
d. exothermic as well as precipitation

42. Fill in the blank:
To a small quantity of X, few drops of HCl are added. Consequently, colourless, odourless gas is produced. This gas on passing through lime water turns it milky proving the presence of _____ of X.

a. carbonate
b. bicarbonate
c. carbide
d. either carbonate or bicarbonate

43. In the following question, an assertion and a reason are given. Choose the correct option:
Assertion: The forces acting on a body can be replaced by the resultant force only as regards the motion of the body as a whole.
Reason: The resultant force cannot replace the several forces acting on a body in other respects.

a. Both assertion and reason are CORRECT and reason is the CORRECT explanation of the assertion

b. Both assertion and reason are CORRECT, but 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

44. What happens when an impure copper rod is taken as the anode and the pure copper rod is taken as the cathode in an electrolysis experiment?

a. The pure copper cathode decreases in size and the impure copper anode increases in size.
b. The pure copper cathode increases in size and the impure copper anode decreases in size.
c. Both the pure copper cathode and impure copper anode increases in size.
d. None of these

45. Which of the following shows the correct sequence (in the increasing order) of heat energy received per unit area from the Sun measured on Earth, Mars and Jupiter?

a. Jupiter > Mars > Earth
b. Earth > Mars > Jupiter
c. Jupiter > Earth > Mars
d. Earth > Jupiter > Mars

46. Four students made the following statements about the metals:
Robert: Metals are malleable.
Arya: All metal oxides are acidic in nature.
James: Metals have lustre.
Peter: Metal atoms have 1, 2 or 3 electrons in the outermost shell.
Which among them spoke incorrectly?

a. Only Robert
b. Only Arya
c. Both James and Arya
d. Both James and Peter

47. What happens when light emitted by a point source of light is passed through a prism?

a. After dispersion, the emerging light would produce a pure spectrum on the screen.
b. After dispersion, the emerging light would produce an impure spectrum on the screen.
c. After dispersion, the emerging light would produce a line spectrum on the screen.
d. None of these

48. Different microorganisms taking part in the nitrogen cycle are:
i. Rhizobium in roots
ii. Ammonifying bacteria
iii. Nitrifying bacteria
iv. Denitrifying bacteria
Which of them strictly work under anaerobic conditions?

a. Only iv
b. i and iv
c. i, ii and iv
d. ii and iv

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

Statement 1: The antibiotic penicillin inhibits the growth of bacteria by blocking the process which helps to build its cell membrane.

Statement 2: The cell membrane is selectively permeable because it allows the movement of certain molecules in and out of the cell while the movement of other molecules is prevented.

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

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

Assertion: The temperature increases inside the fractionating column on going from the bottom to the top.

Reason: The column is not heated at the bottom.

a. Both assertion and reason are true and reason is the correct explanation of assertion.
b. Both assertion and reason are true, but reason is not the correct explanation of the assertion.
c. Assertion is correct, but reason is incorrect.
d. Both assertion and reason are incorrect.

Answer Key

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