

BHAVAN'S SCIENCE OLYMPIAD (BSO)

Class 4 Science - Model Paper Solutions & Answer Key

Full Marks: 50

Total Questions: 45

Time: 1 Hour

Class: 4th Grade

GENERAL SECTION (QUESTIONS 1 – 40)

Q1. Which of the following plants is commonly found in hilly and mountainous regions?

- a) Spruce b) Coconut c) Cactus d) Mangrove

Correct Option: a) Spruce

Explanation: Coniferous trees like spruce and pine adapt to cold mountain climates.

Q2. I have a tail and gills like a fish, swim in water, and hop on land when grown up. Who am I?

- a) Maggot b) Nymph c) Caterpillar d) Tadpole

Correct Option: d) Tadpole

Explanation: A tadpole is the aquatic larval stage of a frog, breathing via gills.

Q3. On which day every year is "World Environment Day" celebrated globally?

- a) 24 April b) 22 March c) 5 June d) 5 July

Correct Option: c) 5 June

Explanation: World Environment Day is observed on June 5 worldwide.

Q4. In an egg structure, what is the yellow central part rich in fats and proteins called?

- a) Yolk b) Albumen c) Shell d) Air Space

Correct Option: a) Yolk

Explanation: The yolk is the central nutrient-rich yellow portion of an egg.

Q5. In which part of the human digestive system does complete digestion of food occur?

- a) Large Intestine b) Small Intestine c) Stomach d) Mouth

Correct Option: b) Small Intestine

Explanation: Complete digestion and absorption of nutrients happen in the small intestine.

Q21. Sucking air out of an inverted glass submerged in water tub causes water level in tub to:

- a) Go down b) Rise c) Form bubbles d) Remain the same

Correct Option: a) Water level in the tub will go down

Explanation: Water rises into the glass to replace removed air, lowering tub water level.

Q22. Nitrogen and sulphur oxides reacting with moisture in air leads to:

- a) Ozone depletion b) Global warming c) Acid rain d) Oil spill

Correct Option: c) Acid rain

Explanation: Sulphur and nitrogen oxides dissolve in atmospheric water to form acid rain.

Q23. Unscramble 'IALCCUM' — an essential mineral for strong bones and teeth:

- a) ONRI b) IALCCUM c) ULUSPHR d) PPECOR

Correct Option: b) CALCIUM

Explanation: IALCCUM unscrambles to CALCIUM, key mineral for bones and teeth.

Q24. What is the organic component of soil created by decomposing organic matter?

- a) Gravel b) Humus c) Sand d) Clay

Correct Option: b) Humus

Explanation: Humus is dark organic matter formed by microbe decomposition of plant matter.

Q25. During which stage of metamorphosis does a butterfly spin a silk cocoon/chrysalis?

- a) Embryo b) Nymph c) Pupa d) Caterpillar

Correct Option: c) Pupa

Explanation: The pupa (chrysalis) stage is where transformation into adult butterfly occurs.

Q6. Which of the following plants does NOT typically grow in desert/coastal regions?

- a) Teak b) Mangrove c) Coconut d) Rubber

Correct Option: a) Teak

Explanation: Teak grows in deciduous forests, whereas mangroves and coconuts thrive in coastal soil.

Q7. Which of the following animals is NOT a marsupial (pouched mammal)?

- a) Wallaby b) Kangaroo c) Wombat d) Duck-billed Platypus

Correct Option: d) Duck-billed Platypus

Explanation: Platypus is an egg-laying mammal (monotreme), not a marsupial.

Q8. Which natural plant fiber is produced from the stem of the flax plant?

- a) Cotton b) Jute c) Linen d) Silk

Correct Option: c) Linen

Explanation: Linen fibers are extracted from the stalks of the flax plant.

Q9. Which process causes water vapor to enter the atmosphere, increasing humidity?

- a) Blowing wind b) Evaporation c) Condensation d) Rotation

Correct Option: b) Evaporation

Explanation: Evaporation converts liquid water into water vapor in the atmosphere.

Q10. Which of the following is NOT one of the main components/types of soil texture?

- a) Sandy b) Clayey c) Gravel d) Loamy

Correct Option: c) Gravel

Explanation: Sand, clay, and loam are soil types; gravel consists of large rock pieces.

Q11. Select the INCORRECT teeth-function pair from the following options:

- a) Incisor - Cutting b) Canine - Tearing c) Molar - Biting
d) Premolar - Crushing

Correct Option: c) Molar - Biting

Explanation: Molars are used for grinding and crushing food; incisors are used for biting.

Q26. Which class of nutrients is required in small quantities for immunity and body functions?

- a) Fats b) Carbohydrates c) Proteins d) Vitamins and minerals

Correct Option: d) Vitamins and minerals

Explanation: Micronutrients like vitamins and minerals are required in small amounts.

Q27. What is the hardest substance found in the human body?

- a) Bone b) Enamel c) Dentine d) Cartilage

Correct Option: b) Enamel

Explanation: Tooth enamel is the most heavily mineralized and hardest substance in humans.

Q28. Which force causes wear and tear in moving parts of machines?

- a) Frictional Force b) Gravitational Force c) Muscular Force d) Magnetic Force

Correct Option: a) Frictional Force

Explanation: Friction produces heat and wear between surfaces moving against each other.

Q29. Which top layer of soil contains maximum humus and supports plant growth best?

- a) Bedrock b) Subsoil c) Top soil d) Weathered rock

Correct Option: c) Top soil

Explanation: Topsoil is rich in organic nutrients and humus, ideal for roots.

Q30. According to physics, when is 'work' considered to be done on an object?

- a) Force is applied b) Object is displaced in force direction
c) No displacement d) Effort is made

Correct Option: b) Object is displaced

Explanation: Work = Force × Distance; work requires movement/displacement.

Q31. Select the correct general chemical equation for forming a solution:

- a) Solute + Solvent = Solution b) Solvent - Solute = Solution
c) Solute + Solvent = Solution d) Solution + Solvent = Solute

Correct Option: c) Solute + Solvent = Solution

Explanation: Dissolving a solute into a solvent forms a homogeneous solution.

Q12. Why do we prefer to wear light-colored cotton clothes during summer?

- a) They reflect heat and keep the body cool
- b) They absorb heat
- c) They trap air
- d) They keep body warm

Correct Option: a) They reflect heat and keep the body cool

Explanation: Light colors reflect most solar radiation, maintaining cooler temperatures.

Q13. Rita needs a transparent material that doesn't melt easily. What should she choose?

- a) Wood
- b) Metal
- c) Crayon
- d) Glass

Correct Option: d) Glass

Explanation: Glass is transparent and has a high thermal resistance compared to crayons or plastic.

Q14. Air conditioners and refrigerators release gases that harm the ozone layer. These are:

- a) CNG
- b) CFCs
- c) Oxygen
- d) Nitrogen

Correct Option: b) CFCs

Explanation: Chlorofluorocarbons (CFCs) are synthetic coolants harmful to the ozone layer.

Q15. Pluto was reclassified as a dwarf planet by the IAU on which date?

- a) Dwarf, 24th August 2006
- b) Giant, 24th August 2006
- c) Dwarf, 15th August 2005
- d) Giant, 15th August 2005

Correct Option: a) Dwarf, 24th August 2006

Explanation: Pluto was categorized as a dwarf planet on August 24, 2006.

Q16. Roll times over surfaces P(6s), Q(15s), R(10s), S(18s). Which surface is smoothest?

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

Correct Option: a) P

Explanation: Less time taken indicates less friction; surface P (6 seconds) is the smoothest.

Q17. A sea breeze blows during the day because air above land is ____ and air above sea is ____:

- a) Colder, Warmer
- b) Warmer, Lighter
- c) Heavier, Colder
- d) Warmer, Colder

Correct Option: d) Warmer, Colder

Explanation: Land heats up faster than sea; warm air rises from land, attracting cool air from sea.

Q32. Which of the following human activities directly causes water pollution?

- a) Reducing fossil fuels
- b) Respiration
- c) Avoiding washing animals
- d) Discharging industrial waste

Correct Option: d) Throwing untreated industrial waste in water bodies

Explanation: Dumping toxic industrial effluents contaminates water ecosystems.

Q33. Heating 500ml water in closed flask X until evaporated. Water collected in Y is:

- a) 300 ml
- b) 450 ml
- c) 400 ml
- d) 500 ml

Correct Option: d) 500 ml

Explanation: In a closed distillation system, total mass/volume of condensed water remains 500 ml.

Q34. Deficiency of Vitamin C in human diet causes which health condition?

- a) Night blindness
- b) Scurvy
- c) Rickets
- d) Beri-Beri

Correct Option: b) Scurvy

Explanation: Lack of Vitamin C causes scurvy, leading to bleeding gums and weak immunity.

Q35. Which of the following crops is classified as a Kharif (monsoon) crop?

- a) Rice
- b) Wheat
- c) Pulses
- d) Mustard

Correct Option: a) Rice

Explanation: Rice requires high rainfall and is sown during rainy season (Kharif).

Q36. Which type of aquatic plants lack stomata on their leaf surfaces?

- a) Floating plants
- b) Fixed plants
- c) Underwater plants
- d) Land plants

Correct Option: c) Underwater plants

Explanation: Submerged plants absorb dissolved gases directly through surface cells without stomata.

Q37. Choose the correct biological statement from the following choices:

- a) Birds are cold blooded
- b) Kiwi can fly
- c) Polar bears hibernate
- d) Amphibians lay eggs in water

Correct Option: d) Amphibians lay their eggs in water

Explanation: Amphibians like frogs lay jelly-covered eggs in aquatic environments.

Q18. A magnetic compass points towards magnetic North due to:

- a) Solar Energy b) Moon's gravity c) Earth's Magnetic field d) Earth's gravity

Correct Option: c) Earth's Magnetic field

Explanation: The magnetic needle aligns with Earth's natural magnetic field.

Q19. Which animal pair uses similar organs (lungs) for respiration?

- a) Bat : Fish b) Turtle : Lizard c) Butterfly : Mouse d) Earthworm : Cockroach

Correct Option: b) Turtle : Lizard

Explanation: Both turtles and lizards are reptiles that breathe through lungs.

Q20. Select the correct astronomical statement from the choices below:

- a) Venus has 2 moons b) Saturn's rings are made of ice, rocks, dust
c) Jupiter is farthest d) Mercury is hottest

Correct Option: b) Saturn's rings are made of ice, rocks, dust

Explanation: Saturn has prominent ring systems composed mainly of ice and rocky debris.

Q38. Arrange primary atmospheric gases in DECREASING order of concentration:

- a) Oxygen > Nitrogen > CO₂ b) Nitrogen > Oxygen > Carbon dioxide
c) CO₂ > Nitrogen > Oxygen d) Nitrogen < Oxygen < CO₂

Correct Option: b) Nitrogen > Oxygen > Carbon dioxide

Explanation: Air consists of approx 78% Nitrogen, 21% Oxygen, and 0.04% CO₂.

Q39. Food classification: Herbivore (1), Carnivore (2), Omnivore (3). Correct match:

- a) 1-Cow, 3-Bear b) 2-Crow, 3-Squirrel c) 1-Fox, 3-Lion
d) 1-Eagle, 2-Sparrow

Correct Option: a) 1-Cow, 3-Bear

Explanation: Cow is a primary herbivore (1), and Bear is an omnivore (3).

Q40. Tiny microscopic pores located on the underside of plant leaves are called:

- a) Stomata b) Petiole c) Stalk d) Lamina

Correct Option: a) Stomata

Explanation: Stomata regulate transpiration and gas exchange in leaves.

ACHIEVER'S SECTION (QUESTIONS 41 – 45)

Q41. Unscramble options and select the one that is NOT a cause of soil erosion:

- a) GIULOPGHN b) AFRSAOFETITON c) FORTDESTAIONE
d) AVERONGRZIG

Correct Option: b) AFFORESTATION

Explanation: Afforestation (planting trees) prevents soil erosion, unlike deforestation or overgrazing.

Q42. In a food web, which consumers feed on both plants and animals (omnivores)?

- a) P and S b) Q and U c) R and T d) P and U

Correct Option: d) P and U

Explanation: Organisms receiving arrows directly from both plants and herbivores are omnivores.

Q44. Regarding concentric layers of Earth (P-Inner Core, Q-Outer Core, R-Mantle, S-Crust):

- a) P and Q are liquid b) Layer S makes up most volume
c) Layer above R is crust d) All of these

Correct Option: c) Layer above R is called crust

Explanation: R is mantle; outer layer S above mantle is crust.

Q45. Planet X is closer to the Sun than Planet Y. What can be inferred about revolution?

- a) Planet Y has longer revolution period than X b) Planet X has longer revolution
c) Planet X has longer rotation d) Planet Y has longer rotation

Correct Option: a) Planet Y has longer revolution period than planet X

Explanation: According to Kepler's laws, planets farther from Sun have longer orbital periods.

Q43. Switching on an electric mixer grinder transforms Electrical energy into:

- a) Mechanical, Sound b) Electrical, Heat
- c) Electrical, Sound d) Potential, Mechanical

Correct Option: a) Mechanical and Sound energy

Explanation: Electrical energy converts to kinetic/mechanical motion of blades and sound energy.