

Mazharul Uloom Higher Secondary School, Ambur.

Name of the Student :
Roll No :

Medium of Instruction : English Medium
Class & Section : 10th Std –



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SCIENCE 2 & 5 - MARK QUESTIONS

1. LAWS OF MOTION

Answer briefly:

1. Define inertia. Give its classification.
2. Classify the types of force based on their application.
3. If a 5 N and 15 N forces are acting opposite to one another. Find the resultant force and the direction of action of the resultant force.
4. Differentiate mass and weight.
5. Define moment of a couple.
6. State the principle of moments.
7. State Newton's second law.
8. Why a spanner with a long handle is preferred to tighten screws in heavy vehicles?
9. While catching a cricket ball the fielder lowers his hands backwards. Why?
10. How does an astronaut float in a space shuttle?

Answer in detail:

1. What are the types of inertia? Give an example for each type.
2. State Newton's laws of motion?
3. Deduce the equation of a force using Newton's second law of motion.
4. State and prove the law of conservation of linear momentum.
5. Describe rocket propulsion.
6. State the universal law of gravitation and derive its mathematical expression.
7. Give the applications of gravitation.

2. OPTICS

Answer Briefly:

1. What is refractive index?
2. State Snell's law.
3. Draw a ray diagram to show the image formed by a convex lens when the object is placed between F and 2F.
4. Define dispersion of light.
5. State Rayleigh's law of scattering.
6. Differentiate convex lens and concave lens.
7. What is power of accommodation of eye?
8. What are the causes of 'Myopia'?
9. Why does the sky appear in blue colour?
10. Why are traffic signals red in colour?

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Give the answer in detail:

1. List any five properties of light.
2. Explain the rules for obtaining images formed by a convex lens with the help of ray diagram.
3. Differentiate the eye defects: Myopia and Hypermetropia.
4. Explain the construction and working of a 'Compound Microscope'.

3. THERMAL PHYSICS

Answer in briefly:

1. Define one calorie.
2. Distinguish between linear, arial and superficial expansion.
3. What is co-efficient of cubical expansion?
4. State Boyle's law.
5. State-the law of volume.
6. Distinguish between ideal gas and real gas.
7. What is co-efficient of real expansion?
8. What is co-efficient of apparent expansion?

Answer in detail:

1. Derive the ideal gas equation.
2. Explain the experiment of measuring the real and apparent expansion of a liquid with a neat diagram.

4. ELECTRICITY

Very short answer questions:

1. Define the unit of current.
2. What happens to the resistance, as the conductor is made thicker?
3. Why is tungsten metal used in bulbs, but not in fuse wires?
4. Name any two devices, which are working on the heating effect of the electric current.

Short answer questions:

1. Define electric potential and potential difference.
2. What is the role of the earth wire in domestic circuits?
3. State Ohm's law.
4. Distinguish between the resistivity and conductivity of a conductor.
5. What connection is used in domestic appliances and why?
6. Explain the component and draw the symbols of electric circuit.

Long answer questions:

1. With the help of a circuit diagram derive the formula for the resultant resistance of three resistances connected:
 - a) in series and
 - b) in parallel.
2.
 - a) What is meant by electric current?
 - b) Name and define its unit.
 - c) Which instrument is used to measure the electric current? How should it be connected in a circuit?

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3. a) State Joule's law of heating.
b) An alloy of nickel and chromium is used as the heating element. Why?
c) How does a fuse wire protect electrical appliances?
4. Explain about domestic electric circuits. (Circuit diagram not required)
5. a) What are the advantages of LED TV over the normal TV?
b) List the merits of LED bulb.

5. ACOUSTICS

Answer very briefly:

1. What is a longitudinal wave?
2. What is the audible range of frequency?
3. What is the minimum distance needed for an echo?
4. What will be the frequency sound having 0.20 m as its wavelength, when it travels with a speed of 331 ms^{-1} ?
5. Name three animals, which can hear ultrasonic vibrations.

Answer briefly:

1. Why does sound travel faster on a rainy day than on a dry day?
2. Why does an empty vessel produce more sound than a filled one?
3. Air temperature in the Rajasthan desert can reach 46°C . What is the velocity of sound in air at that temperature?
($V_0 = 331 \text{ m s}^{-1}$)
4. Explain why, the ceilings of concert halls are curved.
5. Mention two cases in which there is no Doppler effect in sound?

Answer in Detail:

1. What are the factors that affect the speed of sound in gases?
2. What is mean by reflection of sound? Explain
 - (a) Reflection at the boundary of a rarer medium
 - (b) Reflection at the boundary of a denser medium
 - (c) Reflection at curved surfaces.
3. a) What do you understand by the term 'ultrasonic vibration'?
b) State three uses of ultrasonic vibrations.
c) Name three animals which can hear ultrasonic vibrations.
4. What is an echo?
 - a) State two conditions necessary for hearing an echo.
 - b) What are the medical applications of echo?
 - c) How can you calculate the speed of sound using echo?

6. NUCLEAR PHYSICS

Answer in one or two word (Very Short Answer):

1. Who discovered natural radioactivity?
2. Which radioactive material is present in the ore of pitchblende?
3. Write any two elements which are used for inducing radioactivity?
4. Write the name of the electromagnetic radiation which is emitted during a natural radioactivity.
5. If A is a radioactive element which emits an α - particle and produces ${}_{104}\text{Rf}^{259}$. Write the atomic number and mass number of the element A.
6. What is the average energy released from a single fission process?
7. Which hazardous radiation is the cause for the genetic disease?
8. What is the amount of radiation that may cause death of a person when exposed to it?

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9. When and where was the first nuclear reactor built?
10. Give the SI unit of radioactivity.
11. Which material protects us from radiation?

Answer the following questions in few sentences:

1. Write any three features of natural and artificial radioactivity.
2. Define critical mass.
3. Define one Roentgen.
4. State Soddy and Fajan's displacement law.
5. Give the function of control rods in a nuclear reactor.
6. In Japan, some of the new born children are having congenital diseases. Why?
7. Mr. Ramu is working as an X - ray technician in a hospital. But, he does not wear the lead aprons. What suggestion will you give to Mr. Ramu?
8. What is stellar energy?
9. Give any two uses of radio isotopes in the field of agriculture?
10. What is stellar energy?

Answer the following questions in detail:

1. Explain the process of controlled and uncontrolled chain reactions.
2. Compare the properties of alpha, beta and gamma radiations.
3. What is a nuclear reactor? Explain its essential parts with their functions.

7. ATOMS AND MOLECULES

Short answer questions:

1. Define Relative atomic mass.
2. Write the different types of isotopes of oxygen and its percentage abundance.
3. Define Atomicity
4. Give any two examples for hetero diatomic molecules.
5. What is Molar volume of a gas?
6. Find the percentage of nitrogen in ammonia.

Long answer questions:

1. Calculate the number of water molecule present in one drop of water which weighs 0.18 g.
2. $N_2 + 3 H_2 \rightarrow 2 NH_3$
(The atomic mass of nitrogen is 14, and that of hydrogen is 1)
1 mole of nitrogen (_____ g) + 3 moles of hydrogen (_____ g) \rightarrow 2 moles of ammonia (_____ g)
3. Calculate the number of moles in
(i) 27g of Al (ii) 1.51×10^{23} molecules of $NH_4 Cl$
4. Give the salient features of "Modern atomic theory".
5. Derive the relationship between Relative molecular mass and Vapour density.

8. PERIODIC CLASSIFICATION OF ELEMENTS

Short answer questions:

1. A is a reddish brown metal, which combines with O_2 at $< 1370 K$ gives B, a black coloured compound. At a temperature $> 1370 K$, A gives C which is red in colour. Find A,B and C with reaction.

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2. A is a silvery white metal. A combines with O_2 to form B at $800^\circ C$, the alloy of A is used in making the aircraft. Find A and B.
3. What is rust? Give the equation for formation of rust.
4. State two conditions necessary for rusting of iron.

Long answer questions:

1. (a) State the reason for addition of caustic alkali to bauxite ore during purification of bauxite.
(b) Along with cryolite and alumina, another substance is added to the electrolyte mixture. Name the substance and give one reason for the addition.
2. The electronic configuration of metal A is 2, 8, 18, 1.
The metal A when exposed to air and moisture forms B a green layered compound. A with con. H_2SO_4 forms C and D along with water. D is a gaseous compound. Find A, B, C and D.
3. Explain smelting process.

9. SOLUTIONS

Short answer questions:

1. Define the term 'Solution'.
2. What is mean by binary solution?
3. Give an example each (i) gas in liquid (ii) solid in liquid (iii) solid in solid (iv) gas in gas.
4. What is aqueous and non-aqueous solution? Give an example.
5. Define Volume percentage.
6. The aquatic animals live more in cold region. Why?
7. Define Hydrated salt.
8. A hot saturated solution of copper sulphate forms crystals as it cools. Why?
9. Classify the following substances into deliquescent, hygroscopic.
Conc. Sulphuric acid, Copper sulphate penta hydrate, Silica gel, Calcium chloride, and Gypsum salt.

Long answer question:

1. Write notes on (i) saturated solution (ii) unsaturated solution.
2. Write notes on various factors affecting solubility.
3. (a) What happens when $MgSO_4 \cdot 7H_2O$ is heated? Write the appropriate equation.
(b) Define solubility.
4. In what way hygroscopic substances differ from deliquescent substances.
5. A solution is prepared by dissolving 45 g of sugar in 180 g of water. Calculate the mass percentage of solute.
6. 3.5 litres of ethanol is present in 15 litres of aqueous solution of ethanol. Calculate volume percent of ethanol solution.

10. TYPES OF CHEMICAL REACTIONS

Short answer questions:

1. What are called thermolysis reactions?
2. Explain the types of double displacement reactions with examples.
3. Explain the factors influencing the rate of a reaction.
4. How does pH play an important role in everyday life?
5. What is a chemical equilibrium? What are its characteristics?

Answer in detail:

1. When an aqueous solution of potassium chloride is added to an aqueous solution of silver nitrate, a white precipitate is formed. Give the chemical equation of this reaction.
2. Why does the reaction rate of a reaction increase on raising the temperature?

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- Define combination reaction. Give one example for an exothermic combination reaction.
- Differentiate reversible and irreversible reactions.

11. CARBON AND ITS COMPOUNDS

Short answer questions:

- Name the simplest ketone and give its structural formula.
- Classify the following compounds based on the pattern of carbon chain and give their structural formula
(i) Propane (ii) Benzene (iii) Cyclobutane (iv) Furan
- How is ethanoic acid prepared from ethanol? Give the chemical equation.
- How do detergents cause water pollution? Suggest remedial measures to prevent this pollution?
- Differentiate soaps and detergents.

Long answer questions:

- What is called homologous series? Give any three of its characteristics?
- Arrive at, systematically, the IUPAC name of the compound: $\text{CH}_3\text{-CH}_2\text{-CH}_2\text{-OH}$.
- How is ethanol manufactured from sugarcane?
- Give the balanced chemical equation of the following reactions:
(i) Neutralization of NaOH with ethanoic acid.
(ii) Evolution of carbon dioxide by the action of ethanoic acid with NaHCO_3 .
(iii) Oxidation of ethanol by acidified potassium dichromate.
(iv) Combustion of ethanol.
- Explain the mechanism of cleansing action of soap.

12. PLANT ANATOMY AND PLANT PHYSIOLOGY

Answer in a sentence:

- What is collateral vascular bundle?
- Where does the carbon that is used in photosynthesis come from?
- What is the common step in aerobic and anaerobic pathway?
- Name the phenomenon by which carbohydrates are oxidized to release ethyl alcohol.

Short answer questions:

- Give an account on vascular bundle of dicot stem.
- Write a short note on mesophyll.
- Draw and label the structure of oxysomes.
- Name the three basic tissues system in flowering plants.
- What is photosynthesis and where in a cell does it occur?
- What is respiratory quotient?
- Why should the light dependent reaction occur before the light independent reaction?
- Write the reaction for photosynthesis?

Long answer questions:

- Differentiate the following
(a) Monocot root and Dicot root
(b) Aerobic and Anaerobic respiration
- Describe and name three stages of cellular respiration that aerobic organisms use to obtain energy from glucose.
- How does the light dependent reaction differ from the light independent reaction? What are the end product and reactants in each? Where does each reaction occur within the chloroplast?

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13. STRUCTURAL ORGANISATION OF ANIMALS

Answer in a sentence:

1. Give the common name of the *Hirudinaria granulosa*.
2. How does leech respire?
3. Write the dental formula of rabbit.
4. How many pairs of testes are present in leech?
5. How is diastema formed in rabbit?
6. What organs are attached to the two bronchi?
7. Which organ acts as suction pump in leech?
8. What does CNS stand for?
9. Why is the teeth of rabbit called heterodont?
10. How does leech suck blood from the host?

Short answer questions:

1. Why are the rings of cartilages found in trachea of rabbit?
2. List out the parasitic adaptations in leech.

Long answer questions:

1. How is the circulatory system designed in leech to compensate the heart structure?
2. How does locomotion take place in leech?
3. Explain the male reproductive system of rabbit with a labeled diagram.

14. TRANSPORTATION IN PLANTS AND CIRCULATION IN ANIMALS

Answer in a word or sentence:

1. Name two layered protective covering of human heart.
2. What is the shape of RBC in human blood?
3. Why is the colour of the blood red?
4. Which kind of cells is found in the lymph?
5. Name the heart valve associated with the major arteries leaving the ventricles.
6. Mention the artery which supplies blood to the heart muscle.

Short answer questions:

1. What causes the opening and closing of guard cells of stomata during transpiration?
2. What is cohesion?
3. Trace the pathway followed by water molecules from the time it enters a plant root to the time it escapes into the atmosphere from a leaf.
4. What would happen to the leaves of a plant that transpires more water than its absorption in the roots?
5. Describe the structure and working of the human heart.
6. Why is the circulation in man referred to as double circulation?
7. What are heart sounds? How are they produced?
8. What is the importance of valves in the heart?
9. Who discovered Rh factor? Why was it named so?
10. How are arteries and veins structurally different from one another?
11. Why is the Sinoatrial node called the pacemaker of heart?
12. Differentiate between systemic circulation and pulmonary circulation.
13. The complete events of cardiac cycle last for 0.8 sec. What is the timing for each event?

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Long answer questions:

1. How do plants absorb water? Explain.
2. What is Transpiration? Give the importance of transpiration.
3. Why are leucocytes classified as granulocytes and agranulocytes? Name each cell and mention its functions.
4. Differentiate between systole and diastole. Explain the conduction of heart beat.
5. Enumerate the functions of blood.

15. NERVOUS SYSTEM

Short answer question:

1. Define stimulus.
2. Name the parts of the hind brain.
3. What are the structures involved in the protection of brain?
4. Give an example for conditioned reflexes.
5. Which acts as a link between the nervous system and endocrine system?
6. Define reflex arc.

Differentiate between

1. Voluntary and involuntary actions.
2. Medullated and non-medullated nerve fibre.

Long answer question:

1. With a neat labeled diagram explain the structure of a neuron.
2. Illustrate the structure and functions of brain.
3. What will you do if someone pricks your hand with a needle? Elucidate the pathway of response with a neat labeled diagram.
4. Describe the structure of spinal cord.
5. How nerve impulses are transferred from one neuron to next neuron?
6. Classify neurons based on its structure.

16. PLANT AND ANIMAL HORMONES

Answer in a word or sentence:

1. Which hormone promotes the production of male flowers in Cucurbits?
2. Write the name of a synthetic auxin.
3. Which hormone induces parthenocarpy in tomatoes?
4. What is the hormone responsible for the secretion of milk in female after child birth?
5. Name the hormone which regulates water and mineral metabolism in man.
6. Which hormone is secreted during emergency situation in man?
7. Which gland secretes digestive enzymes and hormones?
8. Name the endocrine glands associated with kidneys.

Short answer questions:

1. What are synthetic auxins? Give examples.
2. What is bolting? How can it be induced artificially?
3. Bring out any two physiological activities of abscisic acid
4. What will you do to prevent leaf fall and fruit drop in plants? Support your answer with reason.
5. What are chemical messengers?
6. Write the differences between endocrine and exocrine gland.
7. What is the role of parathormone?
8. What are the hormones secreted by posterior lobe of the pituitary gland? Mention the tissues on which they exert their effect.

9. Why are thyroid hormones referred as personality hormone?
10. Which hormone requires iodine for its formation? What will happen if intake of iodine in our diet is low?

Long answer questions:

1. (a) Name the gaseous plant hormone. Describe its three different actions in plants. (b) Which hormone is known as stress hormone in plants? Why?
2. Describe an experiment which demonstrates that growth stimulating hormone is produced at the tip of coleoptiles.
3. Write the physiological effects of gibberellins.
4. Where are estrogens produced? What is the role of estrogens in the human body?
5. What are the conditions which occur due to lack of ADH and insulin? How are the conditions different from one another?

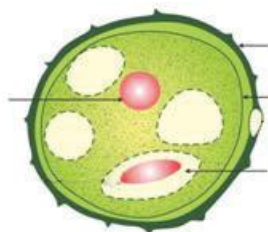
17. REPRODUCTION IN PLANTS AND ANIMALS

Answer in a word or sentence:

1. If one pollen grain produces two male gametes, how many pollen grains are needed to fertilize 10 ovules?
2. In which part of the flower germination of pollen grains takes place?
3. Name two organisms which reproduce through budding.
4. Mention the function of endosperm.
5. Name the hormone responsible for the vigorous contractions of the uterine muscles.
6. What is the enzyme present in acrosome of sperm?
7. When is World Menstrual Hygiene Day observed?
8. What is the need for contraception?
9. Name the part of the human female reproductive system where the following occurs.
 - a. Fertilization
 - b. Implantation

Short answer question:

1. What will happen if you cut planaria into small fragments?
2. Why is vegetative propagation practiced for growing some type of plants?
3. How does binary fission differ from multiple fission?
4. Define triple fusion.
5. Write the characteristics of insect pollinated flowers.
6. Name the secondary sex organs in male
7. What is colostrums? How milk production is hormonally regulated?
8. How can menstrual hygiene be maintained during menstrual days?
9. How does developing embryo get its nourishment inside the mother's body?
10. Identify the parts A, B, C and D



11. Write the events involved in the sexual reproduction of a flowering plant.
 - a. Discuss the first event and write the types.
 - b. Mention the advantages and the disadvantages of that event.

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12. Why are the human testes located outside the abdominal cavity? Name the pouch in which they are present.
13. Luteal phase of the menstrual cycle is also called the secretory phase. Give reason.
14. Why are family planning methods not adopted by all the people of our country?

Long answer questions:

1. With a neat labeled diagram describe the parts of a typical angiospermic ovule.
2. What are the phases of menstrual cycle? Indicate the changes in the ovary and uterus.

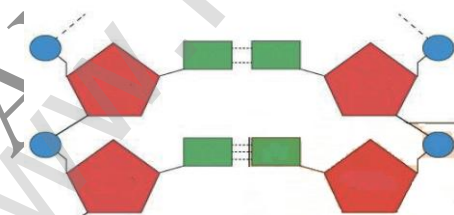
18. HEREDITY

Answer in a sentence:

1. What is a cross in which inheritance of two pairs of contrasting characters are studied?
2. Name the conditions when both the alleles are identical?
3. A garden pea plant produces axial white flowers. Another of the same species produced terminal violet flowers. Identify the dominant trait?
4. What is the name given to the segments of DNA, which are responsible for the inheritance of a particular character?
5. Name the bond which binds the nucleotides in a DNA.

Short answers questions:

1. Why did Mendel select pea plant for his experiments?
2. What do you understand by the term phenotype and genotype?
3. What are allosomes?
4. What are Okazaki fragments?
5. Why is euploidy considered to be advantageous to both plants and animals?
6. A pure tall plant (TT) is crossed with pure dwarf plant (tt), what would be the F₁ and F₂ generations? Explain.
7. Explain the structure of a chromosome.
8. Label the parts of the DNA in the diagram given below. Explain the structure briefly.



Long answer questions:

1. Explain with an example the inheritance of dihybrid cross. How is it different from monohybrid cross?
2. How is the structure of DNA organised? What is the biological significance of DNA?
3. The sex of the new born child is a matter of chance and neither of the parents may be considered responsible for it. What would be the possible fusion of gametes to determine the sex of the child?

19. ORIGIN AND EVOLUTION OF LIFE

Answer in a word or sentence:

1. A human hand, a front leg of a cat, a front flipper of a whale and a bat's wing look dissimilar and adapted for different functions. What is the name given to these organs?
2. Which organism is considered to be the fossil bird?
3. What is the study of fossils called?

Short answers questions:

1. The degenerated wing of a kiwi is an acquired character. Why is it an acquired character?
2. Why is Archaeopteryx considered to be a connecting link?
3. Define Ethnobotany and write its importance.
4. How can you determine the age of the fossils?

Long answer questions:

1. Natural selection is a driving force for evolution-How?
2. How do you differentiate homologous organs from analogous organs?
3. How does fossilization occur in plants?

20. BREEDING AND BIOTECHNOLOGY

Answer in a sentence:

1. Give the name of wheat variety having higher dietary fibre and protein.
2. Semi-dwarf varieties were introduced in rice. This was made possible by the presence of dwarfing gene in rice.
Name this dwarfing gene.
3. Define genetic engineering.
4. Name the types of stem cells.
5. What are transgenic organisms?
6. State the importance of biofertiliser.

Short answers questions:

1. Discuss the method of breeding for disease resistance.
2. Name three improved characteristics of wheat that helped India to achieve high productivity.
3. Name two maize hybrids rich in amino acid lysine
4. Distinguish between
 - (a) Somatic gene therapy and germ line gene therapy.
 - (b) Undifferentiated cells and differentiated cells.
5. State the applications of DNA fingerprinting technique.
6. How are stem cells useful in regenerative process?
7. Differentiate between out breeding and inbreeding.

Long answers questions:

1. What are the effects of hybrid vigour in animals?
2. Describe mutation breeding with an example.
3. Biofortification may help in removing hidden hunger. How?
4. With a neat labeled diagram explain the techniques involved in gene cloning.
5. Discuss the importance of biotechnology in the field of medicine.

21. HEALTH AND DISEASES

Answer in a sentence:

1. What are psychotropic drugs?
2. Mention the diseases caused by tobacco smoke.
3. What are the contributing factors for Obesity?
4. What is adult onset diabetes?
5. What is metastasis?
6. How does insulin deficiency occur?

Short answer questions:

1. What are the various routes by which transmission of human immune deficiency virus takes place ?
2. How is a cancer cell different from a normal cell?
3. Differentiate between Type-1 and Type-2 diabetes mellitus
4. Why is a dietary restriction recommended for an obese individual?
5. What precautions can be taken for preventing heart diseases?

Long answer questions:

1. Suggest measures to overcome the problems of an alcoholic.
2. Changes in lifestyle is a risk factor for occurrence of cardiovascular diseases. Can it be modified? If yes, suggest measures for prevention.

22. ENVIRONMENTAL MANAGEMENT

Answer in a sentence:

1. What will happen if trees are cut down?
2. What would happen if the habitat of wild animals is disturbed?
3. What are the agents of soil erosion?
4. Why fossil fuels are to be conserved?
5. Solar energy is a renewable energy. How?
6. How are e-wastes generated?

Short answer questions:

1. What is the importance of rainwater harvesting?
2. What are the advantages of using biogas?
3. What are the environmental effects caused by sewage?
4. What are the consequences of deforestation?

Long answer questions:

1. How does rainwater harvesting structure recharge ground water?
2. How will you prevent soil erosion?
3. What are the sources of solid wastes? How are solid wastes managed?
4. Enumerate the importance of forest.
5. What are the consequences of soil erosion?
6. Why is the management of forest and wildlife resource considered as a challenging task?

23. VISUAL COMMUNICATION

Answer the following:

1. What is Scratch?
2. Write a short note on editor and its types?
3. What is Stage?
4. What is Sprite?



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