ANSWER KEY

Model Test Paper 2026–27 | Home Science | Class IX | Max Marks: 60

Section A [1 Mark Each]

Q01.
d) All of the above

Q02.
a) Gas leak

Q03.
b) Cotton cloth

Q04.
c) Polyester

Q05.
d) All of the above

Q06.
b) Six

Q07.
6 (or 7)

Q08.
Mulberry

Q09.
2015

Q10.
False (✗)

Q11.
True (✓)

Q12.
True (✓)

Q13.
c) Assertion (A) is correct but Reason (R) is wrong.

Q14.
b) Both A and R are correct but R is not the correct explanation of A.

Q15.
c) A is correct but R is wrong.

Section B [2 Marks Each]

Q16.

A **family** is the most basic and fundamental unit of society. It is a group of people related by blood, marriage, or adoption who live together, share resources, and support one another emotionally, socially, and economically. **Key features of a family:**

Q17.

The Government of India has taken significant steps to make education accessible and free for girls: • Under the **Right to Education (RTE) Act, 2009**, free and compulsory education is guaranteed for all children (boys and girls) from Classes 1 to 8 (ages 6–14).

Q18.

Development is defined as a series of progressive, orderly, and qualitative changes that occur in an individual over their entire lifespan. It refers not just to physical growth but to the overall advancement of a person's abilities, personality, and functioning.

— OR —

Motor Development refers to the progressive development of a child's ability to control and coordinate the movements of their body through the growth and maturation of muscles, bones, and the nervous system.

Q19.

Home Science is an interdisciplinary subject that deals with the science and art of managing home and family life. Its major fields of study are:

1. **Food and Nutrition**.
2. **Human Development and Family Studies**
3. **Fabric and Apparel Sciences**
4. **Resource Management**
5. **Communication and Extension**

Q20.

Our homes contain several substances that can be highly toxic and dangerous, especially to children and elderly members:

1. **Chemical Cleaning Agents**
2. **Pest Control Products**
3. **Medicines and Pharmaceuticals**
4. **Paints, Varnishes, and Solvents**
5. **Batteries and Electronic Waste**

Q21.

Wool is a natural animal fibre obtained by shearing (cutting) the fleece (coat of hair) from various animals. The main sources are: 1. **Sheep** — The most common source of wool worldwide. Merino sheep produce the finest quality wool.

2. **Goat** — *Cashmere* (Pashmina) wool comes
3. **Rabbit**
4. **Camel**
5. **Alpaca and Llama**
6. **Yak**

— OR —

Plant Fibres are natural textile fibres obtained from different structural parts of plants. They are composed mainly of cellulose and are biodegradable, breathable, and eco-friendly. **Classification based on the part of the plant they come from:**

1. **Seed Fibres**
   - *Cotton*
2. **Stem/Bast Fibres**
- *Jute*.
- *Flax (Linen)*
- *Hemp*
3. **Leaf Fibres**
- *Sisal*
- *Coir*

Q22.

The flooring of a bathroom requires very specific qualities due to its environment: 1. **Non-Slippery / Anti-Skid** — .

2. **Water-Resistant and Waterproof** .
3. **Easy to Clean and Hygienic**

Section C [3 Marks Each]

Q23.

Malnutrition is a serious public health condition that arises when a person's diet does not provide the correct amount and variety of nutrients needed for the body to function properly. It encompasses both too little and too much nutrition. **Definition:** Malnutrition is defined as a state of nutrition in which a deficiency, excess, or imbalance of energy, protein, and other nutrients causes measurable adverse effects on body tissues, function, and clinical outcome. **Types of Malnutrition:**

1. **Undernutrition (Deficiency)** — Occurs when the body does not receive adequate calories, proteins, vitamins, or minerals.

2. **Overnutrition (Excess)** — Occurs when the body receives more nutrients (especially calories and fats) than it needs.

Q24.

Differences between Growth and Development:

Aspect	Growth	Development
1. Nature	Quantitative — involves measurable, physical increases in size (height, weight, head circumference).	Qualitative — refers to improvement in the complexity and quality of abilities, skills, and behaviour.

Aspect	Growth	Development
2. Scope	Limited to physical/bodily changes only — increase in height, weight, organ size.	Comprehensive and multidimensional — includes physical, intellectual, emotional, social, and moral dimensions.
3. Duration	Temporary — starts at conception and typically stops when the body reaches physical maturity (around 18–21 years).	Continuous, lifelong process — occurs from conception until death and never truly stops.
4. Measurement	Easily measured using instruments (weighing scale, height chart).	Difficult to measure directly — assessed through observation, psychological tests, and behavioural analysis.
5. Relationship	Growth and development are interrelated — physical growth supports development, but development can occur even without noticeable physical growth (e.g., a person's wisdom and emotional maturity continue to grow in old age even as the body declines).	

— OR —

Development of Temporary and Permanent Teeth in a Child: Teeth are essential for chewing food, proper speech development, and maintaining the jaw structure. Children go through two sets of teeth during their growth. **Temporary Teeth (Milk Teeth / Deciduous Teeth):**

- A child is born with no visible teeth, though tooth buds are already formed in the gums before birth.
- The first milk tooth (usually a lower central incisor) erupts at approximately **6 months of age**.
- Eruption continues gradually through toddlerhood. By the age of **2.5 to 3 years**, all **20 milk teeth** have usually emerged (8 incisors, 4 canines, 8 molars).
- Milk teeth are smaller, whiter, and have thinner enamel compared to permanent teeth.
- These teeth are crucial for chewing nutritious foods, aiding speech development, and holding space inthe jaw for permanent teeth. **Permanent Teeth:**
- Around the age of **6 years**, the milk teeth begin to loosen and fall out (shed) as the permanent teeth develop below and push them out.
- The process of replacement continues gradually through childhood and adolescence.
- By approximately **12–13 years of age**, most of the 28 permanent teeth have erupted.
- The final 4 **wisdom teeth (third molars)** erupt between the ages of **17 and 21**, completing the full set of **32 permanent teeth**.
- Permanent teeth are larger, harder, more yellow-tinted, and are meant to last a lifetime with propercare.

Q25.

Classification of Fibres on the Basis of Their Origin: Fibres are the basic units used to make yarn, and subsequently fabric. They are broadly classified as follows: **1. Natural Fibres** — Obtained directly from nature (plants, animals, or minerals) with minimal processing.

a) Plant / Cellulosic Fibres: Derived from cellulose found in plants.

• *Seed fibre:* **Cotton**

• *Bast/Stem fibre:Jute*

• *Leaf fibre:* **Sisal**, **Coir** (coconut husk).

b) **Animal / Protein Fibres:** Derived from proteins secreted or produced by animals. • **Silk** • **Wool**

c) **Mineral Fibres:**

• **Asbestos**

2. Man-made / Manufactured Fibres — Created artificially through chemical processes.

a) Regenerated / Semi-synthetic Fibres: Made from natural cellulose chemically processed in a factory.

• **Rayon (Viscose)**

• **Acetate**

b) Synthetic Fibres: Entirely man-made from petrochemicals through polymerisation. • **Polyester**

• **Nylon**

• **Acrylic**

• **Spandex/Lycra**

— OR —

Three Characteristics of Cotton Fibre: Cotton is one of the most important and widely used natural plant fibres in the world. It is obtained from the seed pod (boll) of the cotton plant .

1. Highly Absorbent and Breathable:

Cotton has a high moisture absorption capacity — it can absorb up to 27 times its own weight in water. This makes cotton very comfortable to wear in hot and humid weather.

2 .Stronger When Wet:

Unlike many other fibres (such as wool and silk), cotton actually becomes approximately 20–30% stronger when it is wet.

3. Lacks Elasticity and Wrinkles Easily:

Cotton has very poor elasticity — it does not stretch and return to its original shape like wool or spandex. As a result, cotton garments lose their shape easily after wear and tend to wrinkle and crease heavily after washing or sitting.

Q26.

Types of Resources: Resources are broadly classified into the following types: **1. Human Resources:**

These are personal, intangible resources that reside within the individual.

• **Time**

• **Energy**

• **Knowledge and Skills**

• **Attitude and Values**

2. Non-Human / Material Resources:

These are tangible, physical assets.

• **Money**

• **Property and Goods**

• **Equipment and Tools**

— OR —

Reducing Household Waste Through Reuse — With Examples: Reuse means using a product or material again for its original purpose or for a different purpose, instead of discarding it after one use.

. **Examples of Reuse in the Home:**

1. **Glass Jars and Bottles** — Empty jam jars, pickle jars, and glass bottles can be thoroughly washed and reused as containers for storing kitchen spices, grains, homemade preserves, or even as pen holders.
2. **Old Clothing and Fabric** — Worn-out cotton sarees, bedsheets, or old T-shirts can be cut into pieces and reused as cleaning dusters, floor wipes (pochha), or kitchen rags instead of buying new ones.
3. **Plastic Bags and Containers** — Carry bags from shopping can be reused as bin liners, storage bags, or bags for carrying vegetables and groceries on subsequent trips.
4. **Newspaper and Paper Bags** — Old newspapers can be used to wrap fragile items, line cupboard shelves, or make paper bags for waste disposal.

Q27.

Selection of Clothing for Children:

1. Fabric and Material:

- Clothes should be made of **soft, natural fabrics** — ideally **100% cotton** — as cotton is breathable, absorbent, hypoallergenic, and gentle on a child's skin
- **2. Fit and Design:**
- Clothing should be **loose-fitting and comfortable** to allow freedom of movement for running, playing, bending, and sitting.

- **3. Safety:**
- Avoid clothes with **long drawstrings** around the neck or hood — these can wrap around a child's neck and cause strangulation.

- Clothing should not have sharp embellishments like metal studs or pins.

5. Colour and Visibility:

- Bright-coloured or light-coloured clothes are preferred — they make the child visible in public spacesand playing areas.

Q28.

Definition of Recycling:

Recycling is the systematic process of collecting, sorting, cleaning, and reprocessing used or waste materials so that they can be converted into new raw materials or products.

Common Household Items That Can Be Recycled:

1. **Paper and Paper Products** — Newspapers, magazines, cardboard boxes, paper bags, office paper. These are pulped and made into recycled paper, tissue, or packaging material.
2. **Glass** — Glass bottles, jars, and containers. Glass can be melted and remoulded repeatedly without loss of quality. Broken glass (cullet) is used in glassmaking factories.
3. **Metals** — Aluminium cans (cold drink/juice cans), steel tins (food cans), scrap metal. Metals are highly recyclable and retain their properties after recycling.
4. **Plastics** — Plastic bottles (water, shampoo), plastic containers, carry bags, and packaging marked with recycling symbols (■ with numbers 1–7). Different types of plastics are sorted and processed separately.
5. **Electronic Waste (E-waste)** — Old mobile phones, batteries, chargers, computer parts. These contain valuable metals (gold, copper) and toxic materials that need specialised recycling.
6. **Organic Waste** — Kitchen scraps, vegetable peels, and food waste can be composted (a form of biological recycling) to make nutrient-rich manure for gardens.

Q29.

Types of Vitamins

1. Fat-Soluble Vitamins:

These vitamins dissolve in fats and oils. They are absorbed along with dietary fat in the small intestine and stored in the liver and fatty tissues of the body. Because they are stored, excessive intake can lead to toxicity (hypervitaminosis). • **Vitamin A (Retinol)**

- **Vitamin D**
- **Vitamin E**
- **Vitamin K**

2. Water-Soluble Vitamins:

These vitamins dissolve in water. They are not stored in the body (except Vitamin B12) and excess amounts are excreted through urine. They must be replenished daily through diet. • **Vitamin C (Ascorbic Acid)**

• **B-Complex Vitamins** — A group of 8 vitamins that play vital roles in energy metabolism, nerve function, and cell production:

– **B1 (Thiamine)**

– **B3 (Niacin)** — Deficiency

– **B9 (Folic Acid)**

– **B12 (Cobalamin)**

Section D [5 Marks Each]

Q30.

Main Functions of Protein and Its Sources of Availability: Introduction:

. **Main Functions of Protein:**

1. Growth and Development:

Proteins are the primary structural component of every cell in the body. They are essential for building new tissues, developing muscles, and supporting rapid growth

2. Repair and Maintenance of Body Tissues:

Proteins facilitate the repair of worn-out or damaged tissues — for example, healing of wounds, recovery from injury, and replacement of old red blood cells .

3. Synthesis of Enzymes:

All enzymes — biological catalysts that speed up every chemical reaction in the body — are proteins. Without enzymes, digestion, respiration, and metabolism would be impossible.

4. Synthesis of Hormones:

Many important hormones are protein in nature. For example, *insulin* (regulates blood sugar), *growth hormone* (stimulates growth), and *glucagon* (raises blood sugar) are all protein hormones. These hormones regulate critical body processes.

5. Production of Antibodies (Immune Function): The immune system produces antibodies — specific proteins that identify and neutralise foreign substances (bacteria, viruses, allergens) in the body.

6. Transport of Substances:

Certain proteins carry vital substances through the blood. For example, *haemoglobin* (a protein in red blood cells) transports oxygen from the lungs to every cell in the body.

7. Energy Supply (Secondary Function):

Proteins provide **4 kilocalories per gram** of energy. However, they are used as an energy source only when carbohydrates and fats are insufficient.

Sources of Protein:

Animal Sources (Complete Proteins — contain all 9 essential amino acids in adequate proportions):

• Meat (chicken, mutton, beef, pork)

• Fish and seafood (tuna, salmon, prawns)

• Eggs — considered the most perfect protein source (biological value = 100) • Milk, curd, paneer

Plant Sources (Incomplete Proteins — typically lack one or more essential amino acids):

• Pulses and legumes — moong dal, chana dal, rajma, lentils (masoor), toor dal

• Soybeans — the richest plant protein; contains all essential amino acids

• Nuts — almonds, groundnuts, cashews, walnuts

• Seeds — pumpkin seeds, sunflower seeds, sesame

• Whole grains — wheat, rice, oats (small amounts)

— OR —

Malnutrition — Definition and Main Causes: Definition:

Malnutrition is a broad term for a range of conditions caused by an imbalanced diet — one that provides either too few, too many, or the wrong kinds of nutrients. It is not limited to hunger or starvation; it also includes obesity and micronutrient deficiencies. Malnutrition adversely affects physical growth, brain development, immune function, and overall quality of life. **Main Causes of Malnutrition:**

1. Poverty and Economic Inequality:

Poverty is the most fundamental cause of malnutrition. Families with very low incomes cannot afford sufficient quantities of food or a varied, nutrient-rich diet. They rely heavily on cheap, calorie-dense but nutritionally poor foods (like refined grains), which lack essential proteins, vitamins, and minerals. Food insecurity (not knowing where the next meal will come from) is directly linked to undernutrition.

2. Lack of Education and Nutritional Awareness:

Even when food is available, malnutrition can occur due to poor food choices. Many people — especially in rural areas — are not aware of the nutritional requirements of different age groups (infants, children, pregnant women, elderly). They may not know the importance of a balanced diet, leading to monotonous meals that lack variety. Lack of education about breastfeeding, complementary feeding, and hygiene practices is a major cause of infant malnutrition.

3. Poor Sanitation, Hygiene, and Diseases:

Living in unhygienic conditions leads to frequent infections such as diarrhoea, dysentery, typhoid, and intestinal worm infestations. These illnesses:

- Reduce appetite and food intake.
- Impair the absorption of nutrients from the gut.
- Increase the body's nutritional demands (due to fever and immune response).
- Cause the body to use up stored nutrients at a faster rate.

This creates a vicious cycle: malnutrition weakens immunity → more infections → further nutrient loss → worsening malnutrition.

4. Improper Infant and Young Child Feeding Practices:

- Failure to exclusively breastfeed infants for the first 6 months deprives them of essential nutrients andantibodies present in mother's milk.
- Early or delayed introduction of complementary foods (weaning foods) after 6 months affectsnutritional status.
- Feeding infants watered-down formula or contaminated water is a major cause of infant malnutritionand mortality in developing countries.
- Feeding children primarily junk food, processed snacks, or sugar-sweetened beverages leads toovernutrition and micronutrient deficiencies simultaneously.
- **5. Food Insecurity and Unequal Food Distribution:**

Even when food is available at the national level, it may not reach everyone. Natural disasters (floods, droughts), crop failures, armed conflicts, and political instability disrupt food supply chains and displace populations. Social inequalities (gender discrimination, caste-based discrimination) may also mean that certain groups — especially women and girls — consistently receive less food than they need.

6.Cultural and Social Factors:

In some communities, certain nutritious foods are avoided due to cultural taboos or superstitions (e.g., pregnant women being restricted from eating certain fruits, proteins, or eggs). Gender discrimination — where women eat last and least — is also a significant cause of malnutrition among women and girls.

Q31.

Definition of Resources:

A **resource** is anything — tangible or intangible — that can be used by an individual, family, or community to achieve a desired goal, meet a need, or carry out a task. Resources are the tools and means through which people manage their lives. In the context of Home Science and family resource management, resources enable families to fulfil their physical, emotional, social, and economic needs. Examples of resources: time, money, energy, skills, community facilities, material goods. **Main Characteristics of Resources:**

1. Utility:

A resource has value only when it is actually useful for achieving a specific purpose or goal. Something becomes a resource only in relation to a need. For example, water is a resource when you are thirsty or need to cook; an old sewing machine is a resource for someone who can stitch clothes but may be useless to someone who cannot. The utility of a resource varies from person to person and situation to situation.

2. Limitation (Scarcity):

All resources — whether time, money, energy, or natural materials — are finite and limited in supply. No one has unlimited resources. Since human needs and wants are unlimited but resources are scarce, choices and priorities must be made. This scarcity is the very reason why resource management is essential. For example, each person has only 24 hours a day and a fixed income; these must be managed wisely.

3. Inter-relatedness:

Resources are closely connected to one another — the use of one resource often affects or requires the use of another resource. For example:

• Using *time* to cook a meal also requires *energy*, *money* (to buy ingredients), and *knowledge/skills*.

• Using *money* to hire a plumber saves *time* and *energy*.

This interconnectedness means that managing one resource wisely often improves the availability or effectiveness of others.

4. Interchangeability (Substitutability):

In many situations, one resource can substitute for another to achieve the same goal. For example:

• *Money* can replace *time and skill* — instead of stitching a dress yourself, you can pay a tailor.

• *Skill and knowledge* can replace *money* — a person who knows how to repair appliances can save the cost of hiring a technician.

• *Community resources* can compensate for limited *personal material resources* — using a public library instead of buying books.

Interchangeability gives families flexibility in achieving their goals even when certain resources are unavailable or insufficient.

5. Accessibility:

Resources are only effective when they are accessible to the user. A park nearby is a community resource, but if it is unsafe or located too far away, it cannot be utilised. Similarly, internet-based educational resources are useless without connectivity and devices. Accessibility depends on physical availability, economic means, and social factors.

— OR —

Main Benefits/Impacts of the 5R Principle: The **5R Principle** is a framework for sustainable waste management that guides individuals and communities to reduce their environmental impact and manage resources responsibly. The 5Rs stand for: **Refuse, Reduce, Reuse, Repurpose, and Recycle**.

1. **Refuse:** Consciously declining to accept unnecessary items — e.g., refusing single-use plastic bags, refusing excessive packaging, refusing promotional items you don't need. This prevents waste at the source.
2. **Reduce:** Minimising the quantity of resources used and waste generated — e.g., buying only what you need, using energy-efficient appliances, reducing food waste by meal planning.
3. **Reuse:** Using items multiple times before discarding them — e.g., refilling water bottles, using cloth bags instead of disposable ones, reusing glass jars.

4. **Repurpose:** Creatively finding a new use for an old item — e.g., turning old tyres into garden planters, using old sarees as decorative curtains, converting crates into furniture.

5. **Recycle:** Processing waste materials into new products — e.g., converting waste paper into recycled paper, melting glass bottles to make new glassware.

Main Impacts and Benefits of the 5R Principle:

1. Conservation of Natural Resources:

By reducing consumption and recycling materials, the 5Rs significantly decrease the demand for virgin natural resources such as timber, minerals, petroleum, and water. For instance, recycling one tonne of paper saves approximately 17 trees and 26,000 litres of water. This ensures that natural resources are preserved for future generations.

2. Energy Savings:

Manufacturing products from recycled materials requires far less energy than producing them from raw materials. For example:

• Recycled aluminium requires 95% less energy than aluminium made from bauxite ore.

• Recycled glass requires 30% less energy than new glass production.

• Recycled paper uses 60% less energy than virgin paper production.

These energy savings translate directly into reduced fuel consumption and lower electricity bills

3.Reduction of Landfill Waste:

India generates approximately 62 million tonnes of solid waste annually. A significant portion ends up in overflowing landfills that pollute soil and groundwater. By practising the 5Rs, households divert large volumes of waste from landfills — extending the lifespan of existing landfills, reducing land use, and preventing land degradation.

4. **Pollution Mitigation and Climate Change:**

Decomposing organic waste in landfills releases *methane*, a greenhouse gas 25 times more potent than CO2 in trapping heat. Reducing waste reduces methane emissions. Additionally, manufacturing new products from raw materials generates industrial pollution (air, water, and soil). Recycling and reusing materials reduces this industrial burden, thereby lowering greenhouse gas emissions and helping combat climate change.

5. **Economic Benefits for Households:**

• Families that practise the 5Rs spend less on buying new items (reusing and repurposing savesmoney).

• Reducing food waste saves on grocery bills.