

CUET PG 2025 Plastic Arts Question Paper with Solutions

Time Allowed :1 Hour 45 Mins	Maximum Marks :300	Total Questions :75
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General Instructions

General Instructions:

1. Question Paper contains 75 Questions .
2. Each correct answer will have +4 marks and wrong answer will lead to -1
3. Use of any electronic appliances is strictly prohibited.

1. What is the use of pyrometric cones in the Kiln?

- (A) Checking color
- (B) Measuring temperature
- (C) Checking the colour of ceramic body
- (D) Checking the firing quality

Correct Answer: (B) Measuring temperature

Solution: Step 1: Deconstructing the function of Pyrometric Cones. Pyrometric cones are precisely formulated ceramic indicators, crafted into a slender pyramid shape. Their composition is engineered to soften and visibly bend when subjected to a specific combination of temperature and time within a kiln environment.

Step 2: Ascertaining their fundamental role in firing. The principal application of these cones is to serve as a visual signal, confirming that the kiln's interior has not only achieved a target temperature but also that the ceramic items have absorbed the correct amount of thermal energy over time. This combined effect of temperature and duration is known as 'heat-work'. Consequently, their essential function is to gauge the thermal work done during the firing cycle, which is a more comprehensive measure of the firing's success than temperature alone.

💡 Quick Tip

Pyrometric cones do not measure temperature directly like a thermometer. Instead, they measure 'heat-work,' which is a more accurate gauge of how a ceramic piece has matured during firing.

2. Who is known as one of the most consistent practitioners of installation art form-

- (A) Dhan Raj Bhagat
- (B) Vivan Sundaram
- (C) Nagji Patel
- (D) Ramesh Pateria

Correct Answer: (B) Vivan Sundaram

Solution: Step 1: Profiling the artists listed in the options. The individuals listed—Dhan Raj Bhagat, Vivan Sundaram, Nagji Patel, and Ramesh Pateria—are all highly regarded figures in the history of modern and contemporary Indian art.

Step 2: Correlating the specific art form with the correct artist. Among these artists, Vivan Sundaram is distinguished as a pioneering and central figure in the field of installation art in India. His extensive body of work is characterized by large-scale, multimedia installations that critically explore themes of history, memory, politics, and society. While the other artists are celebrated sculptors, their primary contributions lie in more traditional sculptural forms rather than the immersive, space-altering medium of installation art.

💡 Quick Tip

Installation art is a genre of three-dimensional works that are often site-specific and designed to transform the perception of a space. Vivan Sundaram's work is a key example of this form in Indian art history.

3. Identify the contemporary sculptor, who was known as a perfectionist in the 1970s, preferring assemblage and construction in industrial scrape to modelling and casting.

- (A) Raghav Kaneria
- (B) Nagji Patel
- (C) M. Dharmani
- (D) Pushpa Mala

Correct Answer: (A) Raghav Kaneria

Solution: Step 1: Interpreting the artistic methodology described in the question. The question specifies a sculptor from the 1970s whose practice centered on "assemblage and construction in industrial scrape." This technique deviates from traditional methods like modeling (additive) or casting (form-filling), instead focusing on creating forms by joining pre-existing, often discarded, industrial materials.

Step 2: Attributing the described style to the correct artist. Raghav Kaneria is a prominent Indian sculptor whose work, particularly from the 1970s, aligns perfectly with this description. He gained recognition for his inventive use of scrap metal and found industrial components. His sculptures from this period frequently depict animal forms and other figures built through the process of assemblage, demonstrating a mastery of constructing dynamic forms from disparate industrial elements.

💡 Quick Tip

Assemblage is an artistic form or medium usually created on a defined substrate that consists of three-dimensional elements projecting out of or from the substrate. It is similar to collage, a two-dimensional medium.

4. Ramkinkar Vaij worked mostly in a form that was a peculiar synthesis of-

- (A) Classical European and African elements.
- (B) Native folk and cubist elements.
- (C) Classical Indian and European elements.
- (D) North Indian and South Indian elements.

Correct Answer: (B) Native folk and cubist elements.

Solution: Step 1: Examining the artistic context and innovations of Ramkinkar Vaij. As a seminal figure in modern Indian sculpture and a key artist associated with Santiniketan,

Ramkinkar Vaij was celebrated for his radical departure from the prevailing academic art styles of his time.

Step 2: Pinpointing the major stylistic influences in his oeuvre. His sculptural work is defined by an expressive and vigorous style. This unique language is a fusion of two distinct sources: the raw, untamed energy of indigenous folk traditions (particularly inspired by the Santhal community near Santiniketan) and the structural principles of Western modernism, most notably the Cubist deconstruction of form into geometric planes. This masterful synthesis of local vitality and modernist theory resulted in a uniquely powerful and original artistic expression.

 Quick Tip

When studying major artists like Ramkinkar Vaij, focus on the unique synthesis of influences in their work. His blending of local Santhal life with European modernism is his most celebrated contribution.

5. Among the contemporary sculptors of India, who is considered as pioneer in using different craft media and techniques?

- (A) Sankho Chaudhuri
- (B) Dhan Raj Bhagat
- (C) P. V. Jankiram
- (D) Ram Kinkar Vaij

Correct Answer: (A) Sankho Chaudhuri

Solution: Step 1: Clarifying the central theme of the question. The question seeks to identify an Indian sculptor who was a trailblazer in the integration of "craft media and techniques" within their fine art practice. This suggests an artist who intentionally worked to dissolve the traditional hierarchy separating fine art sculpture from artisanal crafts.

Step 2: Assessing the artists based on this criterion. While all the artists listed made significant contributions, Sankho Chaudhuri is particularly distinguished for this specific role. He was renowned for his elegantly simplified forms and his broad experimentation with a diverse range of materials. He purposefully incorporated techniques and media derived from traditional Indian crafts into his modernist sculptural vision, thereby pioneering a new relationship between art and craft in the Indian context.

 Quick Tip

The distinction between 'art' and 'craft' was a significant theme for many modern Indian artists. Artists like Sankho Chaudhuri are important for elevating craft techniques to the level of fine art.

6. Eminent Artist K.G. Subramanyan developed the style of his murals taking inspiration from-

- (A) Lost-wax process of casting.
- (B) Terracotta reliefs and glass painting.
- (C) Fibre sculptures.
- (D) Repoussed copper and metal casted forms drawing on Indian iconography.

Correct Answer: (B) Terracotta reliefs and glass painting.

Solution: Step 1: Characterize the artistic approach of K.G. Subramanyan. K.G. Subramanyan was a profoundly versatile artist and thinker who played a crucial role in bridging modern art ideologies with the rich traditions of Indian crafts. His artistic philosophy was deeply influenced by the environment of Santiniketan.

Step 2: Pinpoint the specific craft traditions central to his mural work. He is widely acclaimed for his monumental murals constructed from individual, fired terracotta tiles, a technique that transformed a humble craft material into a medium for large-scale public art. Furthermore, he was instrumental in reviving and innovating the traditional craft of reverse painting on glass. These two mediums, both deeply rooted in Indian artisanal heritage, formed the technical and aesthetic foundation of his distinctive mural style.

 Quick Tip

K.G. Subramanyan is a key figure in Indian modern art for his dialogue with indigenous materials and craft traditions. His terracotta murals and glass paintings are iconic examples of this synthesis.

7. Which of the following materials is not used in flexible molds?

- (A) Latex
- (B) Korogel
- (C) Gelatin
- (D) Gel Coat

Correct Answer: (D) Gel Coat

Solution: Step 1: Define the purpose and properties of a flexible mold. Flexible molds are essential for casting three-dimensional forms that feature intricate details or undercuts. Their elasticity allows the mold to be peeled or stretched away from the hardened cast object without causing damage. Materials such as latex, silicone rubber, gelatin, and certain hydrogels are commonly used to create these molds.

Step 2: Differentiate the function of a Gel Coat from the mold material. A Gel Coat is fundamentally different; it is not the material that constitutes the mold itself. Instead, it is a specialized, pigmented polyester or epoxy resin that is applied as the initial layer to the inner surface of a rigid mold (e.g., a fiberglass mold). This layer cures to become the smooth, durable, and finished outer surface of the final cast part. Thus, the Gel Coat is part of the final product, not the reusable mold, and it is itself rigid, not flexible.

 Quick Tip

Distinguish between the material that forms the body of the mold (which needs to be flexible) and surface coatings (like a gel coat) that provide a high-quality finish to the cast part.

8. Which of the following materials is not used as a releasing agent?

- (A) Liquid Detergent
- (B) Oil
- (C) Liquid Wax
- (D) Alum

Correct Answer: (D) Alum

Solution: Step 1: Explain the role of a releasing agent in casting. A releasing agent, also known as a mold release agent, is a chemical substance applied to the interior surface of a mold. Its purpose is to form a barrier between the mold and the casting material, preventing adhesion and ensuring that the cured object can be removed cleanly and easily.

Step 2: Differentiate the properties of the given options. Common household and industrial materials like liquid detergent (soap), various oils (e.g., mineral oil, petroleum jelly), and liquid waxes all function effectively as release agents because they create a non-stick, lubricating film. In contrast, Alum (potassium aluminum sulfate) is a chemical salt with astringent and flocculating properties. It is used in processes like water purification, pickling, and as a mordant in dyeing, but it lacks the necessary properties to function as a barrier or lubricant for mold release.

 Quick Tip

A good rule of thumb for identifying release agents is to think of common slippery or non-stick substances. Alum does not share these properties and has different industrial and chemical uses.

9. Which of the following materials is used for the Flexible molds?

- (A) Ice
- (B) Korogel
- (C) Coal
- (D) Resin

Correct Answer: (B) Korogel

Solution: Step 1: Assess the viability of each option as a mold-making material. Ice is unsuitable due to its transient nature and low melting point. Coal is a brittle, solid rock and cannot be used to create a flexible mold. "Resin" is an overly broad term; while some specific types, like silicone resins, are flexible, many others, such as epoxy or polyester casting resins, are designed to cure into a hard, rigid state.

Step 2: Pinpoint the most appropriate material from the list. Korogel is a specific type of hydrogel, which is a network of polymer chains that are highly absorbent. It is known for its flexible, gelatinous consistency. In certain specialized applications, including conservation and mold-making, its properties make it a suitable material for creating a flexible mold. Therefore, among the choices provided, Korogel is the most accurate and specific answer.

 Quick Tip

When faced with a general term like "resin" and a specific material like "Korogel," the specific material is often the intended correct answer if it fits the description.

10. What is clay?

- (A) Moist, stiff, tenacious earth
- (B) Hard, nonporous and fired
- (C) Hard, porous and baked
- (D) Baked, hard and non-porous

Correct Answer: (A) Moist, stiff, tenacious earth

Solution: Step 1: Establish a clear distinction between the raw material and the processed product. The question is asking for the definition of "clay" in its natural, unfired state, as it is used by potters and sculptors. This is distinct from the final, hardened material that results from firing.

Step 2: Evaluate the options based on the properties of raw clay. Option (A) provides an accurate physical description of unfired, plastic clay: it is a naturally occurring earth that, when mixed with water, becomes moist; it is stiff enough to hold a shape; and it is tenacious, meaning its particles adhere to one another, giving it cohesiveness. Options (B), (C), and (D) describe properties such as hardness and porosity that are the result of the irreversible chemical and physical changes that occur when clay is fired in a kiln. After firing, the material is no longer called clay, but ceramic.

 Quick Tip

Always distinguish between the raw material and the finished product. Clay is the workable earth; ceramic is the hard, permanent object created after firing the clay.

11. What is sand?

- (A) Fine Silica
- (B) Flint
- (C) Grog
- (D) Feldspar

Correct Answer: (A) Fine Silica

Solution: Step 1: Determine the fundamental chemical makeup of common sand. Sand is a naturally occurring granular material made of finely divided rock and mineral particles. The most prevalent mineral component in most sands worldwide is silicon dioxide (SiO_2), which is also known as silica.

Step 2: Analyze the given options within a ceramic context. "Fine Silica" is the most precise chemical description of sand. Flint is a specific form of microcrystalline quartz, which is chemically silica, but "silica" is the more general and accurate term. Grog is not a raw mineral; it is clay that has been fired and then ground into particles to be added to clay bodies. Feldspar is a distinct group of aluminosilicate minerals that function as a flux in ceramics, not the primary component of sand.

 Quick Tip

In ceramics, materials are often defined by their chemical role. Silica is a primary glass-former, Feldspar is a flux, and Grog is a temper (or opener). Sand is primarily used as a source of silica.

12. What is a maquette?

- (A) Three-dimensional terms of the idea
- (B) Rough Drawing
- (C) Visualization
- (D) Illusion

Correct Answer: (A) Three-dimensional terms of the idea

Solution: Step 1: Provide a formal definition of the term "maquette." In the context of art, particularly sculpture, a maquette is a preliminary model, typically created on a smaller scale than the intended final work. It is a physical object used to plan and refine a design.

Step 2: Deconstruct the options to find the best fit. A maquette is, by its very nature, a three-dimensional object. A "Rough Drawing" is two-dimensional. "Visualization" refers to the cognitive process of imagining a form, not creating a physical representation. "Illusion" refers to a deception of the senses. Option (A), "Three-dimensional terms of the idea," though phrased somewhat abstractly, accurately conveys that a maquette translates a conceptual idea into a tangible, spatial, three-dimensional form. It is the physical embodiment of the initial concept.

 Quick Tip

Think of a maquette as a sculptor's 3D sketch. It's used to explore form, composition, and scale before committing to the final, often much larger, sculpture.

13. What are the characteristics of the stoneware ceramic?

- (A) Soft, porous and moist
- (B) Hard, Fired and non porous

- (C) Fired, porous and soft body
- (D) Soft, porous and opaque body

Correct Answer: (B) Hard, Fired and non porous

Solution: Step 1: Explain the firing process and its effect on stoneware clay. Stoneware is a category of ceramic distinguished by its high firing temperature, generally ranging from 1100°C to 1300°C. This intense heat triggers a crucial process called vitrification, where the fluxing agents within the clay body melt and form a glassy bond between the clay particles.

Step 2: Link the process of vitrification to the material's final properties. The vitrification process fundamentally alters the structure of the clay, making the resulting ceramic body extremely dense, strong, and hard. A key outcome of this densification is that the material becomes non-porous, meaning it will not absorb water. Therefore, the defining characteristics of stoneware are that it is hard, has been fired to a high temperature, and is non-porous. The descriptions involving softness and porosity apply to lower-fired ceramics like earthenware.

 Quick Tip

Ceramic properties are determined by firing temperature. Earthenware is low-fired and porous. Stoneware and Porcelain are high-fired, leading to vitrification, which makes them hard and non-porous.

14. Which of the strong abrasive is used to achieve the smoothness on the stone sculpture?

- (A) Softstone
- (B) Carborundum
- (C) Lime stone
- (D) Sand stone

Correct Answer: (B) Carborundum

Solution: Step 1: Establish the principle of abrasion for working with stone. To effectively smooth, grind, or shape a material like stone, an abrasive must be used. A fundamental principle of abrasion is that the abrasive material must be significantly harder than the material it is intended to work on.

Step 2: Assess the relative hardness of the materials listed. Softstone, Limestone, and Sandstone are all types of rock, the very materials a sculptor might be working on; they are not used as primary abrasives. Carborundum is a well-known trade name for Silicon Carbide (SiC), a synthetic compound of silicon and carbon. On the Mohs scale of mineral hardness, Silicon Carbide has a hardness of about 9 to 9.5, making it one of the hardest materials available, surpassed only by materials like diamond. This extreme hardness makes it an exceptionally effective abrasive for cutting and polishing stone and other hard substances.

 Quick Tip

On the Mohs scale of mineral hardness, most stones (like marble or granite) are between 3 and 7. Silicon Carbide (Carborundum) is about 9.5, making it highly effective for abrading stone.

15. What is the use of 'pouring funnel' in metal casting?

- (A) To escape the gas or air
- (B) To pour the molten metal
- (C) To blow the investment
- (D) To hold the mold

Correct Answer: (B) To pour the molten metal

Solution: Step 1: Contextualize the 'pouring funnel' within the casting process. In metal casting, the mold contains an engineered network of channels, known as the gating or running system, designed to deliver molten metal to the mold cavity. The pouring funnel is a critical component at the entrance of this system.

Step 2: Specify the precise function of the pouring funnel. Also referred to as a pouring cup or basin, the pouring funnel is the wide-mouthed opening where the casting process begins. Its direct and primary purpose is to receive the flow of molten metal from the ladle or crucible. Its funnel shape is designed to manage this initial pour, creating a reservoir that helps guide the metal smoothly into the main vertical channel (the sprue) while minimizing turbulence, preventing the entrapment of air, and reducing the erosion of the mold material. Thus, its function is to facilitate the pouring of molten metal into the mold.

 Quick Tip

The parts of a casting mold system have specific names: the Pouring Funnel (or cup) is for entry, the Sprue is the vertical channel, Runners are horizontal channels, and Gates are the entry points into the mold cavity. Vents are used to let gas escape.

16. What is the use of vertical lifting tongue in metal casting?

- (A) to take out the crucible
- (B) to pour the melted metal
- (C) to separate the metal
- (D) to clean the metal

Correct Answer: (A) to take out the crucible

Solution: Step 1: Define the equipment in question. A crucible is a refractory container specifically designed to withstand extreme temperatures for melting metals inside a furnace. "Vertical lifting tongs" are a type of specialized foundry tool engineered to safely handle these extremely hot and heavy crucibles.

Step 2: Elucidate the specific mechanical function of the tool. The design of vertical lifting tongs, featuring long handles and a secure gripping mechanism, is optimized for one primary task: to grip a crucible firmly and lift it straight up and out of the high-temperature environment of a furnace. This action is the first crucial step in transferring the molten metal from the furnace to the pouring area. Therefore, the tool's main purpose is to safely extract the crucible from the furnace.

 Quick Tip

In a foundry, specialized tools are named for their specific function. "Lifting tongs" are for lifting the crucible, while a "pouring shank" is often used to hold the crucible for the actual pouring.

17. Which of the following metals is a Non-Ferrous Metal?

- (A) Mild Steel
- (B) Steel
- (C) Iron
- (D) Bronze

Correct Answer: (D) Bronze

Solution: Step 1: Provide clear definitions for "Ferrous" and "Non-Ferrous" metals. The term "ferrous" originates from the Latin word *ferrum*, meaning iron. A ferrous metal is therefore any metal or alloy that has iron as its principal constituent. Conversely, non-ferrous metals are all other metals and alloys that do not contain a significant amount of iron.

Step 2: Categorize each option based on these definitions. Iron (Fe) is the elemental basis for all ferrous metals. Steel and Mild Steel are both alloys created by adding carbon to iron, which means they are unequivocally ferrous. Bronze, on the other hand, is an alloy whose primary component is copper, with tin being the most common secondary element. As iron is not a constituent of bronze, it is classified as a non-ferrous metal.

 Quick Tip

A simple way to remember is that if it's a type of iron or steel, it's ferrous. Common non-ferrous metals include aluminum, copper, brass, bronze, and zinc.

18. Who has used sheet-metal to create pictorial sculptures as freestanding forms and embellishing their surfaces with linear elements?

- (A) P. V. Janakiram
- (B) Mrinalini Mukherjee
- (C) Meera Mukherjee
- (D) Lydia Mehta

Correct Answer: (A) P. V. Janakiram

Solution: Step 1: Deconstruct the unique artistic technique described in the question. The question describes a specific sculptural method: the use of sheet metal to build freestanding forms, which are then decorated with linear surface details. This technique points towards metalworking methods like repoussé and chasing, applied to a sculptural rather than a purely decorative context.

Step 2: Align the described technique with the correct artist's known work. P. V.

Janakiram, a key artist of the Madras Art Movement, is celebrated for developing this exact style. His signature work involves hammering and shaping sheet metal (often copper) into freestanding, often frontal, icon-like sculptures. He would then meticulously embellish the surfaces with welded wires and linear patterns, achieving a unique graphic and pictorial quality. This perfectly matches the description. In contrast, Mrinalini Mukherjee worked with dyed hemp fibre, and Meera Mukherjee was renowned for her lost-wax bronze casting inspired by the Dhokra craft.

 Quick Tip

Associate artists with their signature materials and techniques. Janakiram is synonymous with repoussé sheet metal, Mrinalini Mukherjee with fibre, and Meera Mukherjee with Dhokra-inspired bronze.

19. The famous sculpture 'Vishnu lying on Sheshnaga' which was found at Deogarh represents the skillful artistry in-

- (A) Terracotta
- (B) Stone
- (C) Bronze
- (D) Cement

Correct Answer: (B) Stone

Solution: Step 1: Identify the historical and artistic context of the sculpture. The 'Vishnu lying on Sheshnaga' panel, also known as the Anantashayana Vishnu, is a canonical masterpiece of ancient Indian art. It is a large relief panel that forms part of the exterior wall of the Dashavatara Temple, located at Deogarh in Central India.

Step 2: Connect the sculpture to its period and material. The Dashavatara Temple is a prime example of temple architecture from the Gupta Period (circa 5th century CE), an era often referred to as the classical or "golden age" of Indian art. The dominant medium for high-status architecture and sculpture during this period was expertly carved stone. The Deogarh panel is a quintessential example of Gupta period stone carving, celebrated for its sublime grace, harmonious composition, and refined sculptural detail, all executed in sandstone.

💡 Quick Tip

The Gupta period is often called the "Golden Age" of Indian art, particularly noted for its exquisite stone sculptures and temple architecture. The Deogarh temple is a textbook example of this style.

20. Bush hammer is used in -

- (A) Wood carving
- (B) Stone carving
- (C) Cement cast Carving
- (D) Plaster carving

Correct Answer: (B) Stone carving

Solution: Step 1: Describe the physical characteristics of a bush hammer. A bush hammer is a heavy-duty masonry tool. Its head is distinctively designed with a flat face that contains a grid of pyramid-shaped or conical points. When struck against a surface, these multiple points impact the material simultaneously.

Step 2: Specify the tool's primary application and effect. The primary function of a bush hammer is to texturize the surface of hard materials like stone (such as granite or marble) and cured concrete. The impact of the points pulverizes the surface, creating a rough, stippled finish. This is done both for decorative effect and to create a non-slip surface. The tool is far too aggressive and unsuitable for softer materials like wood, plaster, or uncured cement. Therefore, its correct application is in stone carving and finishing.

💡 Quick Tip

The texture created by a bush hammer is often seen on stone steps, paving, and building facades. The name comes from the bush-like appearance of the points on the hammer's head.

21. What are the tools used to split the stones?

- (A) Feathers and Wedges
- (B) Banker
- (C) Pitcher
- (D) Claw

Correct Answer: (A) Feathers and Wedges

Solution: Step 1: Understand the fundamental mechanics of stone splitting. The objective when splitting a large stone is to exert a powerful and evenly distributed outward force from within the stone itself. This force must be applied along a specific line to guide the fracture precisely. Direct impact from the outside is inefficient and uncontrollable for large-scale splitting.

Step 2: Evaluate the function of each tool listed. The "Feathers and Wedges" system, also known as the "plug and feather" method, is perfectly designed for this purpose. The process involves drilling a line of holes into the stone. Two shims, called "feathers," are placed into each hole. A "wedge" is then hammered between the two feathers. This action converts the vertical force of the hammer into a strong, slow, and continuous horizontal force, pressing outwards. As multiple wedges are tightened along the line, the cumulative pressure creates a crack that splits the stone cleanly. In contrast, a "Banker" is a stonemason's workbench; a "Pitcher" is a type of chisel used for rough shaping of the stone's edges; and a "Claw" is a multi-toothed chisel used for texturing and removing material from the surface.

 Quick Tip

The feathers and wedges method is an ancient technique that allows for precise splitting of even the hardest stones like granite. It is still used today.

22. What are the three components mixed up for setting the Glass fiber casting?

- (A) Resin, accelerator and catalyst
- (B) Accelerator, catalyst and fiber matt
- (C) Gel coat, Resin and accelerator
- (D) Gel coat, Resin and Catalyst

Correct Answer: (A) Resin, accelerator and catalyst

Solution: Step 1: Deconstruct the components of a fiberglass casting system. Fiberglass casting involves two main parts: the structural reinforcement (the glass fiber) and the chemical matrix that binds it together (the thermosetting resin). The question asks for the components mixed for "setting," which refers to the chemical reaction that hardens the liquid resin. The glass fiber matt is the inert reinforcement and is not part of the chemical mixture. A gel coat is an optional, pigmented surface layer applied to the mold first, not a core part of the setting mixture.

Step 2: Identify the role of each chemical in the curing process. The hardening of polyester resin is a chemical polymerization process that requires three key ingredients to occur at room temperature.

- **Resin:** This is the base polymer, a thick liquid that will form the solid plastic matrix.
- **Catalyst:** This is the initiator (e.g., MEKP - Methyl Ethyl Ketone Peroxide). It is responsible for starting the chain reaction of polymerization that causes the resin to solidify.
- **Accelerator:** This chemical (e.g., Cobalt Naphthanate) is pre-mixed into the resin by the manufacturer. It speeds up the decomposition of the catalyst, allowing the curing reaction, which would otherwise require high heat, to proceed effectively at room temperature.

Therefore, the three essential components that are mixed to initiate the setting are the Resin (which contains the accelerator) and the Catalyst.

💡 Quick Tip

Think of it as a chain reaction: the Accelerator "wakes up" the Resin so it's ready to react, and the Catalyst "kicks off" the actual hardening process.

23. Which of the following tools is used for wood carving?

- (A) Claw
- (B) Gouges
- (C) Bush
- (D) Hammer

Correct Answer: (B) Gouges

Solution: Step 1: Differentiate between tools for shaping and tools for striking or texturing other materials. A "Claw hammer" and a "Bush hammer" are tools primarily associated with stonework and masonry for texturing and dressing surfaces. A general "Hammer" is an auxiliary tool used to strike another tool, such as a chisel or gouge, but it does not cut the material itself.

Step 2: Identify the primary cutting tool specific to wood carving. "Gouges" are the fundamental shaping tools for wood carving. They are essentially chisels that have a curved, U-shaped or V-shaped cross-section along their cutting edge. This curvature allows the carver to scoop out wood, create hollows, and form rounded or complex three-dimensional shapes. The vast assortment of sweeps (the degree of curvature) and widths of gouges is what provides the woodcarver with the versatility needed for detailed sculptural work.

💡 Quick Tip

The main cutting tools in woodcarving are chisels (for flat cuts) and gouges (for curved cuts). The variety of gouge sweeps (curves) and widths is what allows for detailed sculptural work.

24. Which of the following is the correct chemical formula for Plaster of Paris?

- (A) $4 \text{CaSO}_2 \cdot 2 \text{H}_2\text{O}$
- (B) $\text{CaSO}_4 \cdot 2 \text{H}_2\text{O}$
- (C) $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$
- (D) $3 \text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$

Correct Answer: (C) $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$

Solution: Step 1: Establish the source material for Plaster of Paris. Plaster of Paris is derived from a naturally occurring mineral called gypsum. The chemical name for gypsum is calcium sulfate dihydrate, and its formula is $\text{CaSO}_4 \cdot 2 \text{H}_2\text{O}$. The "dihydrate" part signifies that each molecule of calcium sulfate is bonded with two molecules of water.

Step 2: Understand the chemical transformation during production. To produce Plaster of Paris, gypsum is mined and heated to a temperature of approximately 150°C (302°F). This

industrial heating process, known as calcination, drives off about 75% of the water molecules bound to the calcium sulfate. The dihydrate (two water molecules) is thus converted into a hemihydrate (half a water molecule).

Step 3: Formulate the resulting chemical structure. The resulting substance, calcium sulfate hemihydrate, has the chemical formula $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$. This is the chemical identity of Plaster of Paris. When water is added to the plaster powder, a reverse reaction occurs: it re-absorbs water molecules, recrystallizes, and reverts back to its original gypsum form, releasing heat and hardening into a solid mass.

 Quick Tip

Remember the relationship: Gypsum ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$) has two water molecules. Heating it removes one and a half molecules, leaving Plaster of Paris ($\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$) with "hemi" or half a water molecule.

25. Metal Shim is used for-

- (A) Metal casting
- (B) Fiber casting
- (C) Mould making of Plaster of Paris
- (D) Investment casting

Correct Answer: (C) Mould making of Plaster of Paris

Solution: Step 1: Define the function of a shim in the context of mold making. A shim is a thin, flexible barrier used to create a division or seam within a mold. Its purpose is to separate different sections of the mold as they are being made, allowing the mold to be disassembled and reassembled later.

Step 2: Analyze its application in Plaster of Paris mold making. This technique is particularly crucial when creating a multi-part "piece mold" directly from a non-rigid model, such as a clay sculpture. To create the mold, thin strips of metal (often brass), known as "metal shims," are carefully inserted into the clay model along the desired parting lines. These shims act as a retaining wall. Plaster is then applied to one side of the shim wall to form the first piece of the mold. Once that piece has set, the shims are removed, revealing a clean edge. A release agent is applied to this edge, and plaster is applied to the adjacent section to form the second piece of the mold. This process ensures a precise fit between the mold sections and is a hallmark technique of plaster piece-molding.

 Quick Tip

Shims are the key to creating multi-part piece molds in plaster. They act as a temporary fence that allows you to pour one section of the mold at a time.

26. What is the hardening time of the cement?

- (A) 7 days

- (B) 5 days
- (C) 3 days
- (D) 11 days

Correct Answer: (A) 7 days

Solution: Step 1: Understand the continuous nature of cement hardening. Cement hardening, or curing, is a chemical reaction known as hydration. This process starts the moment water is mixed with the cement and continues for an extended period, potentially years, as long as moisture is present. The strength of the concrete grows rapidly at first and then more slowly over time. There is no single "hardening time."

Step 2: Recognize the standard industry benchmarks for strength testing. In engineering and construction, the strength of concrete is measured at standardized time intervals to ensure quality and predict its final performance. The most common benchmarks are 3 days, 7 days, and 28 days. The 28-day strength is typically considered the reference or design strength. The 7-day strength is a critical early checkpoint because concrete typically achieves about 65-70% of its 28-day strength by this point. Among the options provided, 7 days is the most significant and universally recognized interval for evaluating the initial, substantial hardening of cement.

 Quick Tip

While cement starts setting in hours and continues to harden for years, its strength is commonly measured at 3 days, 7 days, and 28 days. The 28-day strength is the standard for design purposes, and the 7-day strength is a key quality control check.

27. Which of the following are the basic ingredients for the concrete mixture?

- (A) Pabbles and water
- (B) Water, Sand and Cement
- (C) Cement, wood and clay
- (D) Clay and Cement

Correct Answer: (B) Water, Sand and Cement

Solution: Step 1: Define the composition of modern concrete. Concrete is a composite material created from several components. Its structure consists of a paste that binds together a collection of aggregates. The other options are incorrect because they are either incomplete (A) or include materials not used in standard concrete, like wood or clay (C, D), which would compromise its structural integrity.

Step 2: Identify the role of each fundamental ingredient. The mixture has four primary components:

- **Cement:** This is the binder. When mixed with water, it forms a paste that hardens and binds the other components together.
- **Water:** This is the chemical activator. It initiates the hydration process in the cement, causing it to cure and gain strength.

- **Fine Aggregate (Sand):** This fills the small voids between the larger aggregate particles.
- **Coarse Aggregate (Gravel or "Pebbles"):** This forms the main structural skeleton of the concrete, providing bulk and strength.

Option (B) lists three of the four essential ingredients. While it omits the coarse aggregate, it presents the most accurate and fundamental combination of components required to make a cementitious paste and mortar, which is the basis of concrete.

💡 Quick Tip

A simple way to think of concrete is a paste of cement and water that coats and binds together aggregates (sand and gravel) to form a rock-like mass.

28. Which of the following metals has more ductility?

- (A) Zinc
- (B) Tin
- (C) Aluminum
- (D) Copper

Correct Answer: (D) Copper

Solution: Step 1: Provide a precise definition of ductility. Ductility is a material property that quantifies the extent to which it can undergo plastic deformation under tensile stress before it fractures. In simpler terms, it's the ability of a material to be stretched into a wire. This property is dependent on the metal's crystal structure and the strength of its metallic bonds.

Step 2: Perform a comparative analysis of the ductility of the listed metals.

- **Copper (Cu):** Copper is renowned for its exceptional ductility, second only to gold and silver. Its face-centered cubic crystal structure allows for many slip systems, enabling atoms to slide past one another easily without breaking the metallic bonds. This is the primary reason it is the industry standard for electrical wiring.
- **Aluminum (Al):** Aluminum is also highly ductile due to its similar face-centered cubic structure, and it is widely used in wires and foils.
- **Zinc (Zn) and Tin (Sn):** These metals have more complex crystal structures (hexagonal close-packed for Zinc, body-centered tetragonal for Tin) which offer fewer slip planes. Consequently, they are significantly more brittle and exhibit much lower ductility compared to copper and aluminum.

While both copper and aluminum are very ductile, copper is generally considered to possess superior ductility, making it the most correct answer.

 Quick Tip

The extensive use of a metal in wiring (like copper and aluminum) is a strong indicator of its high ductility.

29. Which of the following metals has more corrosion resistance?

- (A) Zinc
- (B) Aluminum
- (C) Copper
- (D) Silver

Correct Answer: (B) Aluminum

Solution: Step 1: Define the mechanism of corrosion resistance. Corrosion resistance is not about a metal's lack of reactivity. Instead, it is often due to a phenomenon called passivation, where a highly reactive metal instantly forms a very thin, stable, and non-porous protective layer of its own oxide upon exposure to the environment. This layer acts as a barrier, preventing further corrosive agents from reaching the base metal.

Step 2: Evaluate the passivation behavior of each metal.

- **Aluminum (Al):** Aluminum is a very reactive metal. When exposed to air, it immediately forms a tough, transparent, and strongly adherent layer of aluminum oxide (Al_2O_3). This passive layer is inert and self-healing; if scratched, it reforms instantly, providing excellent protection against many forms of corrosion.
- **Zinc (Zn):** Zinc is used as a sacrificial coating on steel (galvanizing) because it corrodes preferentially. Its oxide layer is less protective than aluminum's.
- **Copper (Cu):** Copper corrodes slowly to form a green patina (a complex of carbonates and sulfates). While this patina can be protective, the process is slower and less complete than the passivation of aluminum.
- **Silver (Ag):** Silver does not rust but it tarnishes, reacting with sulfur compounds in the air to form a black layer of silver sulfide, which is not protective.

Because of its extremely stable, inert, and self-renewing passive oxide layer, aluminum demonstrates the highest corrosion resistance among the given options in most common environments.

 Quick Tip

Some of the most reactive metals, like aluminum, can be the most corrosion-resistant because they instantly form a tough, protective "skin" of oxide.

30. What is the main purpose of making piece mold?

- (A) To produce more than one production

- (B) To produce single production
- (C) To produce liquid production
- (D) To carve the wood

Correct Answer: (A) To produce more than one production

Solution: Step 1: Define the characteristics of a "piece mold." A piece mold is a rigid outer casing created in multiple, carefully engineered sections that interlock perfectly. Its design is inherently complex, requiring strategic placement of seam lines to capture all the details of an original model, especially those with undercuts (areas where the form curves back on itself).

Step 2: Logically deduce the purpose from its design. The significant effort required to create a multi-section mold is undertaken for one primary reason: reusability. The mold is designed to be carefully disassembled to release a cast without damaging either the cast or the mold itself. Once the cast is removed, the pieces can be cleaned, reassembled, and secured, making the mold ready for the next casting. This contrasts with a "waste mold," which is a simpler, one-piece mold that must be chipped away and destroyed (wasted) to free the single cast inside. Therefore, the main purpose of a piece mold is to enable the creation of multiple identical copies, or an edition, of a sculpture.

 Quick Tip

If a mold can be taken apart and put back together, its purpose is almost always for reuse, enabling the production of multiple copies.

31. Identify the sculptor who has used lost-wax process of casting with reference to folk and tribal art techniques to great creative advantage in his/her sculptures.

- (A) Amar Nath Sehgal
- (B) Balbir Sing Katt
- (C) Meera Mukherjee
- (D) Mrinalini Mukherjee

Correct Answer: (C) Meera Mukherjee

Solution: Step 1: Analyze the specific criteria outlined in the question. The question seeks to identify a sculptor known for a unique synthesis of three distinct elements: the technical use of lost-wax casting, a deep conceptual and stylistic influence from Indian folk and tribal art, and the application of these to create original, modern sculptures.

Step 2: Evaluate the artists based on these criteria. Meera Mukherjee is the artist whose career is most defined by this synthesis. She undertook in-depth study of the traditional Dhokra cire perdue (lost-wax) casting method, learning directly from tribal artisans in the Bastar region of Chhattisgarh. However, she did not simply replicate the folk craft. She ingeniously adapted and scaled up the traditional techniques—such as building the form with wax threads over a clay core—to create her own large-scale, expressive bronze sculptures. Her works, which often feature a characteristic textured surface derived from this folk process, embody a distinctly modern sensibility while being deeply rooted in indigenous Indian craft traditions.

💡 Quick Tip

Meera Mukherjee's signature style is a direct bridge between ancient Indian tribal craft (Dhokra) and modern Indian sculpture.

32. The famous sculpture 'Shiva slays Yama' was carved at-

- (A) Ajanta Caves
- (B) Ellora Caves
- (C) Elephanta Caves
- (D) Bhimbetka Caves

Correct Answer: (B) Ellora Caves

Solution: Step 1: Understand the iconographic theme of the sculpture. The theme 'Shiva slays Yama' depicts a powerful Puranic narrative. It portrays Shiva in his ferocious form as Kalantaka, the "Conqueror of Time and Death." In the story, Shiva emerges to protect his young devotee, Markandeya, from the clutches of Yama, the god of death, thereby granting Markandeya immortality. This dramatic, action-filled scene is a hallmark of dynamic Shaivite iconography.

Step 2: Locate this specific narrative within the given cave sites. The Ellora Caves, particularly those created under the Rashtrakuta dynasty, are celebrated for their massive, high-relief sculptural panels that bring Hindu myths to life with theatrical energy. The Kalantaka theme is a recurring and powerful subject at Ellora. The most notable depictions are found within the monumental Kailasa Temple (Cave 16) and also in the Dhumar Lena (Cave 29). These carvings capture the dramatic intensity of the confrontation, which is characteristic of the Rashtrakuta artistic style. Ajanta is primarily Buddhist, and Bhimbetka is known for prehistoric rock paintings.

💡 Quick Tip

Ellora is renowned for its large-scale, high-relief narrative panels depicting Puranic legends. If a question mentions a dramatic Hindu mythological scene, Ellora is often a strong candidate.

33. Identify the Ellora Cave, where the sculpture of 'Govardhandhari Krishna' is carved-

- (A) Cave No. 13
- (B) Cave No. 16
- (C) Cave No. 20
- (D) Cave No. 15

Correct Answer: (B) Cave No. 16

Solution: Step 1: Identify the specific iconographic subject. 'Govardhandhari Krishna' (or Krishan Govardhanadhara) illustrates the famous episode from the Bhagavata Purana where

Lord Krishna, as a young boy, effortlessly lifts the entire Govardhan Hill with one finger to shield the inhabitants of Vrindavan from a torrential downpour sent by an enraged Indra, the king of the gods.

Step 2: Pinpoint the location of this sculpture within the Ellora complex. Cave No. 16 at Ellora is the world-renowned Kailasa Temple, the largest monolithic rock-cut structure on Earth. Although its main dedication is to Lord Shiva, the temple's walls and subsidiary shrines are adorned with a comprehensive array of Hindu mythology, including numerous Vaishnava themes. A large and prominent panel depicting Krishna lifting Mount Govardhan is carved on the southern wall of the main temple hall within the Kailasa complex. While a version is also found in the Dashavatara cave (Cave 15), the panel in Cave 16 is one of the most celebrated sculptures at the site.

 Quick Tip

Cave 16 (Kailasa Temple) is the centerpiece of Ellora and contains a vast repertoire of Hindu mythology. Many of the most famous sculptures from Ellora are located within this single cave complex.

34. 'Das Avatara' from cave no 15 of the Ellora was carved during which century?

- (A) 2nd C.E.
- (B) 5th C.E.
- (C) 8th C.E.
- (D) 13th C.E.

Correct Answer: (C) 8th C.E.

Solution: Step 1: Identify the specific cave and its historical patronage. Cave 15 at Ellora is famously known as the Dashavatara Cave because it features numerous grand panels depicting the ten avatars (incarnations) of Vishnu. Historical inscriptions link the patronage of this cave, and indeed the most active phase of Hindu excavation at Ellora, to the Rashtrakuta dynasty. Specifically, the conversion of this cave from an earlier Buddhist monastery into a magnificent Hindu temple is attributed to the Rashtrakuta king, Dantidurga.

Step 2: Establish the chronological period of the patron's reign. The Rashtrakuta dynasty was a dominant power in the Deccan region from the 8th to the 10th centuries C.E. The reign of its founder, Dantidurga, is firmly dated to the mid-8th century, approximately from 735 to 756 C.E. Since the sculptural program of the Dashavatara cave was executed under his rule, the carvings can be confidently assigned to the 8th century C.E.

 Quick Tip

The majority of the Hindu and Jain caves at Ellora, including the most famous ones like Cave 15 and 16, were created under the patronage of the Rashtrakuta dynasty (8th-10th centuries).

35. The famous sculpture 'Queen mother and baby prince' (Badoh) is displayed in-

- (A) Gwalior Museum
- (B) Patna Museum
- (C) Craft Museum
- (D) National Museum

Correct Answer: (D) National Museum

Solution: Step 1: Identify the sculpture and its significance. The sculpture referred to as "Queen mother and baby prince" (or sometimes simply "Mother and Child") was discovered at Badoh in Madhya Pradesh. It is a celebrated masterpiece of the early medieval period in India (c. 9th-10th century CE), lauded for its graceful lines, naturalistic pose, and the tender emotion it conveys.

Step 2: Determine the current location of this nationally significant artifact. Due to its exceptional artistic quality and historical importance, this sculpture is considered a national treasure. Such key artifacts, excavated from various archaeological sites across the country, are typically housed in the central national repository for preservation, study, and public exhibition. The "Mother and Child" from Badoh is a prominent exhibit in the archaeology galleries of the National Museum in New Delhi.

💡 Quick Tip

Many of India's most iconic and historically significant sculptures, discovered from various archaeological sites across the country, are housed in the National Museum, New Delhi, for preservation and public display.

36. The famous panel of sculpture called 'Descent of the Bodhisattva in the form of a white elephant' is displayed in-

- (A) State archaeological museum
- (B) National museum
- (C) Nagarjunakonda archaeological museum
- (D) Indian Museum

Correct Answer: (D) Indian Museum

Solution: Step 1: Identify the artwork, its subject, and its archaeological origin. The panel in question depicts the dream of Queen Maya, a key event preceding the birth of Siddhartha Gautama (the Buddha). In the dream, a white elephant, representing the Bodhisattva, descends from heaven to enter her womb, symbolizing a pure and auspicious conception. This narrative relief is a hallmark piece from the stone railings (vedika) of the Bharhut Stupa, a major monument of the Shunga period (c. 2nd century BCE).

Step 2: Trace the provenance of the Bharhut Stupa artifacts. The site of the Bharhut Stupa was excavated by Sir Alexander Cunningham in the 19th century. To protect the invaluable and delicate carvings from deterioration, the majority of the stupa's surviving gateways and railings were systematically dismantled and transported for preservation. They were moved to

the Indian Museum in Kolkata, which was the premier museum of British India at the time. Today, the Indian Museum holds the world's most extensive and important collection of Bharhut sculptures, where they form a centerpiece of the collection.

 Quick Tip

When a question refers to major artifacts from the Bharhut Stupa, the Indian Museum in Kolkata is almost always the correct answer, as it holds the principal collection.

37. Which of the following metals has the lowest melting point?

- (A) Aluminium
- (B) Tin
- (C) Zinc
- (D) Copper

Correct Answer: (B) Tin

Solution: Step 1: Retrieve the standard melting points for each of the metals listed. A comparison of the physical properties of these common metals reveals their melting points, which is the temperature at which they transition from a solid to a liquid state.

- **Copper (Cu):** The highest in this group, melting at approximately 1085°C (1984°F).
- **Aluminium (Al):** Melts at a medium-high temperature of approximately 660°C (1220°F).
- **Zinc (Zn):** Melts at a lower temperature of approximately 420°C (787°F).
- **Tin (Sn):** Has a distinctly low melting point of approximately 232°C (450°F).

Step 2: Compare the collected data to identify the lowest value. By direct comparison of their melting temperatures, Tin (Sn) at 232°C has the lowest melting point among the four options. This characteristic property is what makes tin and its alloys ideal for applications like soldering, where a metal is needed to melt and flow at a relatively low temperature to join other components.

 Quick Tip

Metals with low melting points like tin and lead have historically been easy to work with and are common in solders and low-temperature casting alloys.

38. Which of the following is an alloy?

- (A) Brass
- (B) Copper
- (C) Zinc
- (D) Gold

Correct Answer: (A) Brass

Solution: Step 1: Define the difference between a metallic element and an alloy. A metallic element is a pure substance that consists of only one type of atom with a unique atomic number, and it is found on the periodic table of elements. An alloy, on the other hand, is a substance created by melting and mixing two or more elements, with at least one of them being a metal. Alloys are created to achieve specific properties (like increased strength, hardness, or corrosion resistance) that are superior to those of the pure constituent metals.

Step 2: Categorize each of the options provided.

- **Copper (Cu), Zinc (Zn), and Gold (Au):** These are all pure metallic elements, each with its own symbol on the periodic table.
- **Brass:** This is not a pure element. It is a well-known metal alloy that is primarily made by combining copper and zinc. The proportions can be varied to create different types of brass with different properties.

Therefore, Brass is the only alloy in the list.

 Quick Tip

Common alloys to remember are Brass (Copper + Zinc), Bronze (Copper + Tin), and Steel (Iron + Carbon).

39. The 'Dancing Girl' from Mohenjo Daro is a part of the collection at-

- (A) National Museum, New Delhi
- (B) Prince of Wales Museum, London
- (C) National Gallery of Modern Art, Mumbai
- (D) Sarnath Museum, Varanasi

Correct Answer: (A) National Museum, New Delhi

Solution: Step 1: Identify the artifact and its historical context. The 'Dancing Girl' is a small (10.5 cm) but immensely significant bronze statuette created using the lost-wax casting technique. It dates back to the Mature Harappan period of the Indus Valley Civilization, around 2500 BCE. It is celebrated worldwide for its naturalistic pose, confident demeanor, and the advanced level of artistry and metallurgy it represents from such an early period.

Step 2: Determine its post-excavation history and current location. The statuette was excavated in Mohenjo-Daro (in modern-day Pakistan) in the 1920s. Following the Partition of India in 1947, the archaeological finds from the major Indus Valley sites were divided between India and Pakistan. The 'Dancing Girl' was allocated to India. As one of the most precious and iconic artifacts of ancient Indian heritage, it is housed and displayed in the National Museum, New Delhi, where it is a star attraction in the Harappan Gallery.

 Quick Tip

Key artifacts of the Indus Valley Civilization are split between India and Pakistan. The 'Dancing Girl' and the 'Priest-King' are two of the most famous; the 'Dancing Girl' is in New Delhi, while the 'Priest-King' is in the National Museum of Pakistan, Karachi.

40. The famous sculpture 'Parvati and Ganesa' from early 6th c. C.E. is displayed in-

- (A) Baroda Museum
- (B) Gwalior Museum
- (C) Patna Museum
- (D) Bihar Museum

Correct Answer: (B) Gwalior Museum

Solution: Step 1: Identify the historical and geographical context of the sculpture. A sculpture of 'Parvati and Ganesha' dating to the early 6th century C.E. places it within the late Gupta or post-Gupta period, an era of classical excellence in Indian sculpture. The region of Central India, particularly the area around modern-day Gwalior in Madhya Pradesh, was a major center for artistic production during this time and is rich in archaeological sites from this period.

Step 2: Connect the artifact to its most likely regional museum. Regional archaeological museums are often the primary repositories for artifacts discovered in their vicinity. The Gujari Mahal Archaeological Museum, located within the Gwalior Fort, was specifically established to house the significant sculptural and archaeological treasures unearthed in and around Gwalior. Its collection is particularly strong in artifacts from the Gupta and subsequent medieval periods, making it the correct location for a significant 6th-century sculpture from that area.

 Quick Tip

Regional archaeological museums often hold the most important finds from their respective areas. For sculptures from Central India (like Madhya Pradesh), the Gwalior Museum is a major repository.

41. Which of the following qualities is not a characteristic of the metals?

- (A) Malleability
- (B) Hardness
- (C) Ductility
- (D) Fragility

Correct Answer: (D) Fragility

Solution: Step 1: Analyze the fundamental properties of metals based on their atomic structure. Metals are characterized by metallic bonds, where electrons are delocalized in a "sea" that surrounds a lattice of positive ions. This structure allows the ions to slide past one another without breaking the bonds.

- **Malleability:** The ability to be hammered into a thin sheet. This is a direct result of the metallic bond, which allows atomic planes to slip over each other under compressive stress.
- **Hardness:** The resistance to localized deformation such as scratching. Most metals are hard to varying degrees.
- **Ductility:** The ability to be drawn into a wire. This property also relies on the metallic bond's ability to withstand tensile stress and allow atoms to rearrange.
- **Fragility:** The tendency of a material to fracture with little to no plastic deformation. This is characteristic of materials with rigid ionic or covalent bonds, like ceramics or glass, where stress causes bond cleavage rather than atomic slippage.

Step 2: Contrast these properties to identify the non-characteristic quality. Malleability, hardness, and ductility are all classic, defining properties of metals that stem directly from their unique metallic bonding. Fragility is the antithesis of malleability and ductility. While some specific metal alloys can be made brittle, fragility is not a general or inherent characteristic of the metallic class of elements. Therefore, it is the quality that is not a characteristic of metals.

 Quick Tip

Metals bend, non-metals break. Malleability and ductility describe ways of bending and reshaping, while fragility describes breaking.

42. When was the 'Lion Capital' Ashokan Pillar carved?

- (A) 1st Century BCE
- (B) 3rd Century BCE
- (C) 5th Century BCE
- (D) 7th Century BCE

Correct Answer: (B) 3rd Century BCE

Solution: Step 1: Identify the historical figure associated with the pillar. The 'Lion Capital' is the most famous part of a pillar created under the patronage of the Mauryan Emperor Ashoka the Great. These pillars were erected across his empire to propagate the Dharma (Buddha's teachings). **Step 2:** Determine the specific historical period of Emperor Ashoka's reign. Historical records and archaeological evidence firmly place Ashoka's rule from circa 268 to 232 BCE. The entirety of this period falls within the 3rd Century BCE (which spans from 300 BCE to 201 BCE). As the pillar was a product of his imperial commission, it must have been carved during his reign in the 3rd Century BCE.

 Quick Tip

Mauryan art is synonymous with the reign of Emperor Ashoka, which is firmly dated to the 3rd Century BCE.

43. Identify the correct height of the famous sculpture 'Lion Capital' in cm -

- (A) 213 cm
- (B) 170 cm
- (C) 258 cm
- (D) 295 cm

Correct Answer: (A) 213 cm

Solution: Step 1: Recall the documented dimensions of the Lion Capital of Ashoka. For academic and archival purposes, major historical artifacts like this are measured in the metric system. The official height of the sculpture is recorded as 2.15 meters. **Step 2:** Convert the height from meters to centimeters to match the options provided. The conversion factor is 1 meter = 100 centimeters. Therefore, the calculation is $2.15 \text{ meters} \times 100 \frac{\text{cm}}{\text{meter}} = 215 \text{ cm}$. **Step 3:** Compare the calculated height with the given options. The value of 215 cm is extremely close to option (A) 213 cm. In questions involving physical measurements of ancient artifacts, minor discrepancies can arise from rounding or different points of measurement. 213 cm is the nearest and therefore the correct choice.

 Quick Tip

Remembering the height of the Lion Capital as "just over 2 meters" or "about 7 feet" can help you quickly select the correct value from a list of options.

44. Identify the medium of the famous sculpture 'Lion Capital' -

- (A) Lime Stone
- (B) Sand Stone
- (C) Pink Marble
- (D) Granite

Correct Answer: (B) Sand Stone

Solution: Step 1: Recall the key material characteristics of imperial Mauryan art. The great pillars commissioned by Emperor Ashoka are renowned for two features: they are monolithic (carved from a single, massive piece of stone) and they are made from a specific type of stone that is given a distinctive finish. **Step 2:** Identify the specific type of stone and its origin. The material used was a buff-colored, fine-grained sandstone. This stone was quarried exclusively from Chunar, near Varanasi (Benares), and transported over great distances for the creation of the pillars. This sandstone was selected for its uniform texture and, crucially, its ability to receive the unique, high-gloss finish known as "Mauryan polish."

This mirror-like polish is a hallmark of Ashokan sculpture and helps distinguish it from later works. Therefore, Sand Stone is the correct medium.

 Quick Tip

Ashokan pillars are famous for two things: being monolithic (single-stone) and being made of highly polished Chunar Sandstone.

45. Select the museum where this famous sculpture 'Lion Capital' is displayed -

- (A) Sarnath Museum
- (B) Indian Museum
- (C) Bharat Kala Bhavan Museum
- (D) Indian Archaeological Museum

Correct Answer: (A) Sarnath Museum

Solution: Step 1: Recall the original historical and geographical context of the Lion Capital. The pillar upon which the capital was placed was erected by Emperor Ashoka at Sarnath. This site was specifically chosen because it is the deer park where the Buddha delivered his first sermon after attaining enlightenment, a foundational event in Buddhism.

Step 2: Connect the discovery of the artifact to its current location. During excavations by the Archaeological Survey of India in the winter of 1904–05, the capital was unearthed at Sarnath in a fragmented but well-preserved state. To house this and other significant discoveries from the site, the Sarnath Museum was constructed. It is common archaeological practice to establish site museums to preserve and display artifacts in the context of their discovery. The Lion Capital, being the most important find and now the National Emblem of India, is the prime exhibit at the Sarnath Museum.

 Quick Tip

Major archaeological finds are often housed in a site museum built specifically for them. For the Lion Capital, its home is the Sarnath Museum, located at the very place it was found.

46. Identify the metals by its sequential order from its minimum to maximum malleability? (A) Nickel (B) Zinc (C) Platinum (D) Copper (E) Silver

Choose the **correct** answer from the options given below:

- (1) (A), (B), (C), (D), (E)
- (2) (D), (E), (A), (B), (C)
- (3) (B), (E), (D), (C)
- (4) (E), (D), (C), (B), (A)

Correct Answer: There appears to be a typo in option (3). Based on standard metallurgical properties, the correct sequence is Zinc ; Nickel ; Platinum ; Copper ; Silver. If

we assume option (3) intended to be (B), (A), (C), (D), (E), it would be the closest correct sequence. However, none of the options perfectly match the established order. For this problem, we will reconstruct the most plausible intended answer. The order of malleability from least to most is generally: Zinc, Nickel, Platinum, Copper, Silver. Thus, the sequence is (B), (A), (C), (D), (E).

Solution: Step 1: Define malleability in a metallurgical context. Malleability is a metal's ability to deform under compressive stress without fracturing. This property is heavily influenced by the metal's crystal structure; face-centered cubic (FCC) metals are typically more malleable than body-centered cubic (BCC) or hexagonal close-packed (HCP) metals.

Step 2: Evaluate each metal's relative malleability based on its properties.

- (B) Zinc: Has an HCP crystal structure, which provides fewer slip planes, making it relatively brittle and the least malleable on this list at room temperature.
- (A) Nickel: Is an FCC metal and is quite malleable, but its high strength makes it less so than the softer metals.
- (C) Platinum: Is a very ductile and malleable FCC metal, characteristic of precious metals.
- (D) Copper: An FCC metal, it is highly malleable and a standard for this property, used widely in sheets.
- (E) Silver: An FCC metal, it is exceptionally malleable, surpassed only by gold among all metals.

Step 3: Assemble the sequence from minimum to maximum malleability. Based on the analysis, the correct order is: Zinc (least malleable), followed by Nickel, then Platinum, then Copper, and finally Silver (most malleable). This corresponds to the sequence (B), (A), (C), (D), (E). As noted in the correct answer, none of the provided options exactly match this scientifically established order, indicating an error in the question's choices.

💡 Quick Tip

The most malleable metals are the precious metals (Gold, Silver, Platinum), followed by common ductile metals like Copper and Aluminum. Less malleable metals include Zinc and Iron.

47. Correct order adopted for making sculptures through lost wax process- (A)

Application of the facing (B) Modelling the wax form over the core (C) Preparation of the core (D) Melting and pouring the metals (E) Application of the negative mold investment material

Choose the **correct** answer from the options given below:

- (1) (C), (B), (A), (E), (D)
- (2) (B), (A), (C), (E), (D)
- (3) (A), (C), (E), (B), (D)
- (4) (D), (B), (C), (A), (E)

Correct Answer: (1) (C), (B), (A), (E), (D)

Solution: Step 1: Deconstruct the lost-wax (cire-perdue) casting process into its logical, sequential stages, starting from the inside out.

- (C) Preparation of the core: The process begins with creating a sturdy inner core, typically from a refractory (heat-resistant) material like clay mixed with sand. This core forms the hollow interior of the final sculpture.
- (B) Modelling the wax form over the core: A layer of wax is applied over this core. This wax layer is meticulously sculpted into the exact final shape and detail of the intended artwork. The thickness of the wax determines the thickness of the final metal sculpture.
- (A) Application of the facing: To perfectly capture the fine details of the wax model, a very fine, liquid layer of investment material (like a silica slurry) is carefully applied directly onto the wax surface.
- (E) Application of the negative mold investment material: After the facing layer sets, the entire object is encased in a much coarser, stronger investment material to build up the main mold, which must be robust enough to withstand the heat and pressure of the molten metal. Sprues and vents are also integrated at this stage.
- (D) Melting and pouring the metals: The completed mold is heated in a kiln. This hardens the mold and melts the wax, which flows out through the sprues (hence "lost wax"). Molten metal is then poured into the resulting empty cavity.

Step 2: Compare this logical progression with the given options. The correct chronological order of operations is (C), (B), (A), (E), (D). This sequence perfectly matches option (1).

💡 Quick Tip

Think of lost-wax casting as building from the inside out: Core -> Wax model -> Investment Mold. Then, the wax is replaced by metal.

48. Identify the metals by its sequential order from its maximum to minimum ductility? (A) Lead (B) Tin (C) Zinc (D) Aluminum (E) Copper

Choose the **correct** answer from the options given below:

- (1) (E), (D), (C), (B), (A)
- (2) (A), (B), (E), (D), (C)
- (3) (D), (E), (A), (B), (C)
- (4) (A), (B), (C), (D), (E)

Correct Answer: (1) (E), (D), (C), (B), (A)

Solution: Step 1: Define ductility. Ductility is a measure of a material's ability to undergo significant plastic deformation under tensile stress before fracturing, most commonly exemplified by the ability to be drawn into a thin wire. **Step 2:** Evaluate and rank the given metals based on their relative ductility, from highest to lowest.

- (E) Copper: Possesses excellent ductility, which is a primary reason for its extensive use in manufacturing electrical wiring.

- (D) Aluminum: Is also a very ductile metal, frequently used for wiring and foils. Its ductility is generally ranked just below that of copper.
- (C) Zinc: Exhibits moderate ductility, but it is significantly less ductile than copper and aluminum and can be brittle depending on temperature and purity.
- (B) Tin: Has relatively low ductility and is not easily drawn into wire.
- (A) Lead: Is extremely soft and malleable, but it has very low tensile strength and thus very poor ductility. It cannot be effectively drawn into a wire because it will break easily under tension.

Step 3: Construct the final sequence. Ordering the metals from maximum to minimum ductility results in the sequence: Copper, Aluminum, Zinc, Tin, Lead. This corresponds to the letter sequence (E), (D), (C), (B), (A), which directly matches option (1).

Quick Tip

High ductility is often associated with good electrical conductivity. Metals used for wires (like copper and aluminum) are at the top of the ductility list, while soft, heavy metals (like lead) are at the bottom.

49. Metals having maximum to minimum resistance to corrosion (A) Zinc (B) Aluminum (C) Copper (D) Tin (E) Gold

Choose the **correct** answer from the options given below:

- (1) (E), (D), (C), (B), (A)
- (2) (E), (B), (C), (D), (A)
- (3) (A), (B), (C), (D), (E)
- (4) (A), (C), (D), (E), (B)

Correct Answer: (2) (E), (B), (C), (D), (A)

Solution: Step 1: Analyze the mechanism of corrosion for each metal and rank them from most resistant (least reactive) to least resistant (most reactive).

- (E) Gold: Is a noble metal. This means it is chemically inert and does not react with oxygen or most other substances under normal conditions, giving it the highest possible resistance to corrosion.
- (B) Aluminum: Is actually a very reactive metal, but it instantly forms a thin, tough, transparent, and non-reactive layer of aluminum oxide (Al_2O_3) on its surface upon exposure to air. This "passivation layer" is self-healing and provides excellent protection against further corrosion.
- (C) Copper: Corrodes slowly over time, forming a characteristic green patina. This patina layer adheres to the surface and provides a degree of protection to the underlying metal from further corrosion.

- (D) Tin: Is quite stable and resistant to corrosion from water, but is susceptible to acids and alkalis. Its resistance is generally less robust than that of copper or passivated aluminum.
- (A) Zinc: Is a highly reactive metal that corrodes readily. This high reactivity is precisely why it is used as a "sacrificial" coating for steel in the process of galvanization—the zinc corrodes first, protecting the steel underneath.

Step 2: Construct the sequence from maximum to minimum resistance. The resulting order is Gold, Aluminum, Copper, Tin, Zinc. This corresponds to the sequence (E), (B), (C), (D), (A), which matches option (2).

💡 Quick Tip

Noble metals like gold and platinum are most resistant to corrosion. Metals that form a strong passive oxide layer (like aluminum and titanium) are next. Metals used for sacrificial coatings (like zinc) are the least resistant.

50. Identify the metals by their sequential order from minimum to maximum malleability. (A) Tin (B) Platinum (C) Zinc (D) Iron (E) Nickel

Choose the **correct** answer from the options given below:

- (1) (A), (B), (C), (D), (E)
- (2) (E), (D), (C), (B), (A)
- (3) (D), (E), (A), (B), (C)
- (4) (C), (D), (E), (A), (B)

Correct Answer: (4) (C), (D), (E), (A), (B)

Solution: Step 1: Evaluate the relative malleability of each listed metal, ranking them from the lowest (least malleable) to the highest (most malleable).

- (C) Zinc: At room temperature, zinc's hexagonal crystal structure makes it relatively brittle and one of the least malleable metals in this group.
- (D) Iron: In its pure form, iron is reasonably malleable, especially when heated. However, it is harder and less malleable than the other metals on the list besides zinc.
- (E) Nickel: Exhibits good malleability and ductility, superior to that of iron.
- (A) Tin: Is a very soft metal that is known for being highly malleable, though it has low tensile strength.
- (B) Platinum: As a precious metal, platinum is exceptionally malleable and ductile, capable of being hammered into extremely thin sheets.

Step 2: Assemble the sequence and match it to the options. The correct order from minimum to maximum malleability is Zinc, Iron, Nickel, Tin, Platinum. This corresponds to the letter sequence (C), (D), (E), (A), (B), which is identical to option (4).

💡 Quick Tip

When ordering malleability, start by identifying the most and least malleable metals. Precious metals like Platinum are typically near the top, while harder or more brittle metals like Zinc and Iron are at the bottom.

51. Identify the process of making earthenware body- (A) Baking or firing (B) Building forms by coiling, slabs or pressing clay (C) Drying (D) Mixing of different additives like sand, grog etc. (E) Preparing clay

Choose the **correct** answer from the options given below:

- (1) (E), (D), (B), (C), (A)
- (2) (A), (D), (C), (B), (E)
- (3) (A), (B), (C), (D), (E)
- (4) (E), (D), (C), (A), (B)

Correct Answer: (1) (E), (D), (B), (C), (A)

Solution: Step 1: Logically order the fundamental stages of creating a ceramic object, from raw material to finished product.

- (E) Preparing clay: The absolute first step is to process the raw clay. This involves cleaning it of impurities and then wedging (kneading) it to achieve a uniform, plastic consistency and to remove air bubbles that could cause it to explode during firing.
- (D) Mixing of different additives: After the base clay is prepared, additives or "tempers" like sand, grog (pre-fired and ground clay), or other materials are mixed in. This is done to control shrinkage, reduce cracking during drying and firing, and achieve a desired final texture. The resulting mixture is the "clay body."
- (B) Building forms: With the clay body ready, the artist or potter then shapes the object. This is the creative stage, using methods such as wheel throwing, hand-building with coils or slabs, or pressing into a mold.
- (C) Drying: The newly formed piece, known as greenware, is wet and fragile. It must be allowed to dry slowly and thoroughly until it is "bone-dry." This removes all the physical water before it enters the kiln.
- (A) Baking or firing: The final stage is firing the bone-dry piece in a kiln. This high-temperature process causes an irreversible chemical change, vitrifying the clay particles and turning the fragile greenware into hard, durable ceramic (earthenware).

Step 2: Match this established sequence with the given choices. The correct order is (E), (D), (B), (C), (A), which corresponds to option (1).

💡 Quick Tip

The ceramic process always follows the same basic path: Prepare Clay -> Form Object -> Dry Object -> Fire Object.

52. Aluminum sculpture can be given a black patina by immersing the sculpture in a bath of solution made from the following chemicals: (A) Copper Sulphate (B) Caustic Soda (C) Acetic Acid (D) Calcium Chloride (E) Water

- (1) (A), (B), (C), (D), (E)
(2) (A), (B), (E) and (D)
(3) (B), (C), (E) and (A)
(4) (B), (D) and (E) only

Correct Answer: (4) (B), (D) and (E) only

Solution: Step 1: Understand the chemical challenge of patinating aluminum. Aluminum naturally forms a very stable, non-reactive oxide layer. To apply a patina, this layer must first be stripped or etched away. Strong alkaline solutions are effective at this. **Step 2:** Analyze the role of the listed chemicals.

- (B) Caustic Soda (Sodium Hydroxide, NaOH): This is a powerful alkali that readily dissolves the protective aluminum oxide layer and etches the underlying aluminum metal, which is a crucial first step for many coloring processes.
- (E) Water: This is the essential solvent used to dissolve the chemicals and create the liquid bath for immersion.
- (D) Calcium Chloride (CaCl_2): This salt can be used in etching solutions, sometimes acting as an accelerator or to modify the surface reaction. Certain formulations for blackening aluminum utilize a solution containing caustic soda and other salts.
- (A) Copper Sulphate and (C) Acetic Acid: These are more commonly used in patinas for copper, bronze, or steel and are not standard components for producing a black patina on aluminum via a caustic bath.

Step 3: Conclude the most viable combination. The combination of Caustic Soda (the primary etchant), Calcium Chloride (a modifying salt), and Water (the solvent) represents a chemically plausible solution for treating an aluminum surface to create a black finish. Therefore, (B), (D), and (E) is the correct combination.

 Quick Tip

Patination of aluminum often involves strong alkalis like caustic soda to break down the passive oxide layer and allow the surface to react.

53. Select the right order of dynasties starting from the oldest to newer one with reference to history of Indians sculptures (A) Maurya (B) Sunga (C) Nanda (D) Gupta (E) Pallava

Choose the **correct** answer from the options given below:

- (1) (E), (C), (D), (A), (B)
(2) (C), (A), (B), (D), (E)

- (3) (A), (B), (C), (D), (E)
(4) (B), (D), (A), (E), (C)

Correct Answer: (2) (C), (A), (B), (D), (E)

Solution: Step 1: Establish the chronological sequence of the given Indian dynasties based on historical timelines.

- (C) Nanda Dynasty (c. 345–322 BCE): A powerful Magadha-based empire that preceded the Mauryas. While few sculptures survive, they set the stage for large-scale imperial rule.
- (A) Maurya Dynasty (c. 322–185 BCE): Founded by Chandragupta Maurya, this dynasty marks the first great epoch of Indian stone sculpture, exemplified by the monumental and highly polished pillars of Emperor Ashoka.
- (B) Sunga Dynasty (c. 185–73 BCE): This dynasty succeeded the Mauryas and is associated with the development of stupa architecture and narrative relief carvings, such as those at Bharhut and Sanchi.
- (D) Gupta Dynasty (c. 320–550 CE): Often called the "Golden Age" of India, this later period saw the perfection of classical Indian sculpture, with iconic, spiritual depictions of Hindu and Buddhist deities.
- (E) Pallava Dynasty (c. 275–897 CE): A major power in South India, their artistic legacy is defined by monolithic rock-cut architecture and sculpture, famously at Mahabalipuram. They were contemporaries of the later Guptas and outlasted them.

Step 2: Arrange the dynasties from oldest to newest based on these timelines. The correct historical progression is Nanda, followed by Maurya, then Sunga, then Gupta, and finally Pallava. This corresponds to the sequence (C), (A), (B), (D), (E), which matches option (2).

 Quick Tip

A helpful mnemonic for early Magadhan empires is "Ha-Shi-Na-M-S-K": Haryanka, Shishunaga, Nanda, Maurya, Sunga, Kanva. This places Nanda before Maurya and Sunga correctly. The Guptas mark a later classical era.

54. Correct sequence of 'Ramayana scenes' depicted at the 'Kailasha temple' of Ellora - (A) Battle of Ravana and Jatayu (B) Rama leaving from Ayodhya (C) Conversation between Rama and Sugreeva (D) Victory of Rama (E) Burning of Lanka

Choose the **correct** answer from the options given below:

- (1) (B), (A), (C), (E), (D)
(2) (A), (C), (D), (B), (E)
(3) (C), (B), (A), (E), (D)
(4) (E), (D), (B), (A), (C)

Correct Answer: (1) (B), (A), (C), (E), (D)

Solution: Step 1: Reconstruct the narrative arc of the Ramayana epic to place the listed events in their correct story order. The depictions in narrative art like that at the Kailasha temple follow the plot of the source text.

- (B) Rama leaving from Ayodhya: The story begins with Rama’s unjust exile from his kingdom, which sets the entire epic in motion.
- (A) Battle of Ravana and Jatayu: During the exile, Sita is abducted by the demon king Ravana. The heroic vulture king Jatayu attempts to stop him, leading to this dramatic battle.
- (C) Conversation between Rama and Sugreeva: In his search for Sita, Rama travels south and forms a critical alliance with Sugreeva, the king of the vanaras (monkey-like beings), who pledges his army to help.
- (E) Burning of Lanka: As part of the search, Sugreeva’s general, Hanuman, leaps to the island of Lanka, finds Sita, and as a show of force, sets the city ablaze with his tail.
- (D) Victory of Rama: This is the story’s climax, representing the final great battle where Rama, aided by Sugreeva’s army, defeats and kills Ravana, rescuing Sita.

Step 2: Match the narrative sequence to the given options. The correct chronological flow of events is (B) -> (A) -> (C) -> (E) -> (D). This sequence matches option (1).

💡 Quick Tip

When sequencing narrative art, follow the plot of the story. The Kailasha temple reliefs follow the epic’s timeline: Exile -> Abduction -> Alliance -> Search -> Climax.

55. Identify the correct chronological order of the artists. (A) Somnath Hore (B) Satish Gujral (C) P. V. Jankiram (D) Ved Nayar (E) Mrinalini Mukherjee

Choose the **correct** answer from the options given below:

- (1) (D), (E), (B), (C), (A)
- (2) (A), (B), (C), (D), (E)
- (3) (E), (D), (C), (B), (A)
- (4) (B), (A), (D), (C), (E)

Correct Answer: (2) (A), (B), (C), (D), (E)

Solution: Step 1: To establish the correct chronological order, determine the birth year of each artist, which places them within their respective generations of modern Indian art.

- (A) Somnath Hore (1921–2006): A seminal printmaker and sculptor, deeply influenced by the Bengal Famine and socialist ideals.
- (B) Satish Gujral (1925–2020): A prominent painter, sculptor, and architect of the post-independence generation.
- (C) P. V. Janakiram (1930–1995): A sculptor known for his unique use of repoussé techniques on sheet metal, part of the Madras Art Movement.

- (D) Ved Nayar (born 1933): A modernist sculptor who was part of the "Group 1890" and is known for his drawings and installations.
- (E) Mrinalini Mukherjee (1949–2015): Belonging to a subsequent generation, she became famous for her monumental, woven sculptures using natural fibers like hemp rope.

Step 2: Arrange the artists in ascending order of their birth years. The sequence from earliest to latest born is: Somnath Hore (1921), Satish Gujral (1925), P. V. Janakiram (1930), Ved Nayar (1933), and Mrinalini Mukherjee (1949). This corresponds to the sequence (A), (B), (C), (D), (E), which matches option (2).

💡 Quick Tip

Knowing the approximate generation of major artists is key. Hore and Gujral were part of the post-independence generation, followed by Janakiram and Nayar, with Mukherjee belonging to the next generation of modernists.

56. What are the terms used during the Cire-perdue process? (A) Slip (B) Core vents (C) Sprue (D) Ducts (E) Claw

Choose the **correct** answer from the options given below:

- (1) (A), (B) and (E) only
- (2) (D) and (E) only
- (3) (A) and (D) only
- (4) (B), (C) and (D) only

Correct Answer: (4) (B), (C) and (D) only

Solution: Step 1: Analyze each term in the specific context of metal casting, particularly the lost-wax (Cire-perdue) method. The process involves creating a mold and channels for molten metal and escaping gases.

- (A) Slip: This term refers to a liquid mixture of clay and water used in ceramics for joining pieces or for surface decoration. It is not a metal casting term.
- (B) Core vents: These are essential channels or passages made through the inner core of the mold. Their function is to allow hot gases, generated when the molten metal meets the mold material, to escape. Without vents, these gases would be trapped and cause porosity or incomplete casting.
- (C) Sprue: This is the main vertical channel in the mold through which the molten metal is poured from the crucible. It acts as the primary entryway for the metal.
- (D) Ducts: Also known as runners or gates, these are smaller channels that branch off from the sprue and lead the molten metal to all parts of the mold cavity, ensuring the entire form is filled.
- (E) Claw: This refers to a type of chisel or tool used for carving stone or wood, not a component of the casting process itself.

Step 2: Identify the terms directly related to the structure of the mold. Core vents, sprues, and ducts are all integral parts of the "plumbing" system of a casting mold. Therefore, (B), (C), and (D) are the correct terms used in the Cire-perdue process.

 Quick Tip

Think of the lost-wax mold as a plumbing system for molten metal. Sprues are the main pipes, ducts are the smaller pipes, and vents are the exhaust system for gases.

57. What are the components of Bronze? (A) Copper (B) Silver (C) Zinc (D) Tin (E) Iron

Choose the **correct** answer from the options given below:

- (1) (D), (B) and (C) only
- (2) (A), (B) and (C) only
- (3) (A), (C) and (D) only
- (4) (C), (D) and (E) only

Correct Answer: (3) (A), (C) and (D) only

Solution: Step 1: Define the alloy "Bronze" in its classical and modern sense. An alloy is a mixture of metals.

- The principal or primary component of all bronze alloys is (A) Copper. It forms the base of the metal mixture.
- The traditional and historical definition of bronze is an alloy of copper with (D) Tin as the main alloying element. Adding tin to copper significantly increases its hardness and strength.
- In modern usage, other elements can be added or substituted. (C) Zinc is a very common addition to bronze. Adding zinc can improve the casting properties and lower the melting point. An alloy with copper and zinc as the main components is technically brass, but many alloys classified as bronze contain significant amounts of all three metals.
- (B) Silver and (E) Iron are not standard components in common bronze alloys.

Step 2: Based on this analysis, identify the combination that best represents the components of bronze. The most accurate and comprehensive description includes the primary component (Copper), the classic alloying element (Tin), and a common modern addition (Zinc). Therefore, the combination of (A), (C), and (D) is the correct answer.

 Quick Tip

The fundamental recipe for classic bronze is Copper + Tin. Brass is Copper + Zinc. Remember these two key copper alloys.

58. Identify the cubist sculptors- (A) Auguste Rodin (B) Alexander Archiponko (C) Pablo Picasso (D) Umberto Boccioni (E) Henri Laurens

Choose the **correct** answer from the options given below:

- (1) (A), (D) and (E) only
- (2) (B), (C) and (E) only
- (3) (A) and (D) only
- (4) (C) and (D) only

Correct Answer: (2) (B), (C) and (E) only

Solution: Step 1: Analyze each sculptor's artistic movement to determine their affiliation with Cubism. Cubist sculpture involves fragmenting three-dimensional forms into geometric planes and exploring subjects from multiple viewpoints simultaneously.

- (A) Auguste Rodin (1840-1917): A monumental figure who is considered the progenitor of modern sculpture. His work is rooted in Realism and Impressionism, focusing on emotional intensity and naturalistic surfaces, predating the geometric abstraction of Cubism.
- (B) Alexander Archipenko (1887-1964): An early and influential pioneer who directly applied Cubist theories to sculpture. He is famous for introducing sculpted voids and negative space as integral parts of the form and for his geometric stylization of the human figure.
- (C) Pablo Picasso (1881-1973): As a co-inventor of Cubism, his sculptural work was revolutionary. He translated the principles of his paintings into three dimensions, creating assemblages and constructed sculptures like "Guitar" and "Head of a Woman (Fernande)" that broke with traditional monolithic carving.
- (D) Umberto Boccioni (1882-1916): A leading member of the Italian Futurist movement. While Futurism was influenced by the formal discoveries of Cubism, its core focus was on dynamism, speed, and the machine, making it a distinct and separate movement.
- (E) Henri Laurens (1885-1954): A French sculptor who was a central figure in the Cubist movement alongside Picasso and Georges Braque, creating works that explored the fragmentation and geometric reconstruction of objects and figures.

Step 2: Consolidate the artists who are correctly identified as Cubist sculptors. Based on the analysis, Alexander Archipenko, Pablo Picasso, and Henri Laurens are the definitive Cubist sculptors in the list. This corresponds to the combination (B), (C), and (E).

💡 Quick Tip

Cubism in sculpture, like in painting, involves breaking down objects into geometric forms and showing multiple viewpoints. Picasso, Archipenko, Lipchitz, and Laurens are key figures to remember.

59. What are the releasing agents of moldcast (A) Polyester resin (B) Liquid detergent (C) Oil (D) Slip (E) Resin

Choose the **correct** answer from the options given below:

- (1) (A) and (B) only
- (2) (B) and (E) only
- (3) (A), (E) and (C) only
- (4) (B), (C) and (D) only

Correct Answer: Based on common practices, (B) Liquid detergent and (C) Oil are used as releasing agents. The options provided seem to have an error, as none correctly isolate just (B) and (C). However, if we must choose, option (4) is the least incorrect, although it wrongly includes (D) Slip.

Solution: Step 1: Define the function of a "releasing agent" in the context of mold making and casting. A releasing agent is a substance that is applied as a micro-thin barrier coating to the interior surface of a mold. Its purpose is to prevent the casting material (such as plaster, resin, or concrete) from physically or chemically bonding to the mold surface, thereby ensuring a clean and easy separation of the cast from the mold. **Step 2:** Evaluate each listed substance to determine if it functions as a release agent or a casting material.

- (A) Polyester resin & (E) Resin: These are thermosetting polymers used as the casting material itself. They are the substances that are poured into the mold to create the final object, not agents to facilitate release.
- (B) Liquid detergent: A dilute solution of soap or detergent is a widely used, simple, and effective release agent, particularly for casting plaster into plaster molds. It forms a thin, soapy film that prevents the new plaster from sticking.
- (C) Oil: Various types of oils, from household petroleum jelly to specialized silicone or wax-based mold release sprays, are common releasing agents. They create a non-stick, hydrophobic layer on the mold surface.
- (D) Slip: This is a term specific to ceramics, referring to a liquid mixture of clay and water. It is used as a glue to join clay parts or for decoration, not as a general-purpose release agent for other casting materials.

Step 3: Identify the substances that are correctly classified as releasing agents. From the list, only (B) Liquid detergent and (C) Oil are standard releasing agents. Since no option contains only (B) and (C), it indicates a flaw in the provided choices.

💡 Quick Tip

A releasing agent is anything that creates a barrier between the mold and the casting. Think of it like greasing a cake pan: common household items like soap or oil often work.

60. What are the retarding agents of Plaster of Paris? (A) Cold water (B) Warm water (C) Acetic acid (D) Alcohol (E) Salt

Choose the **correct** answer from the options given below:

- (1) (A), (C) and (D) only

- (2) (A), (D) and (E) only
- (3) (A) and (E) only
- (4) (B) and (D) only

Correct Answer: (1) (A), (C) and (D) only

Solution: Step 1: Understand the chemical process of plaster setting. Plaster of Paris (calcium sulfate hemihydrate) hardens through an exothermic chemical reaction called hydration, where it combines with water to reform into gypsum (calcium sulfate dihydrate), forming an interlocking crystal mesh. A retarding agent is a substance added to the mix to slow down this reaction, providing a longer working time. An accelerator speeds it up. **Step 2:** Analyze how each substance affects the hydration reaction.

- (A) Cold water: Chemical reactions are temperature-dependent. Using cold water lowers the overall temperature of the mixture, thereby slowing down the rate of the hydration reaction and retarding the set time.
- (B) Warm water: Conversely, warm water increases the kinetic energy of the molecules, speeding up the hydration reaction and acting as an accelerator.
- (C) Acetic acid: Acids, like vinegar, act as retarders by interfering with the formation and growth of the gypsum crystals, thus slowing down the hardening process.
- (D) Alcohol: Alcohol also acts as a retarder because it disrupts the normal hydration process of the calcium sulfate particles.
- (E) Salt (Sodium Chloride): Common salt is a powerful accelerator. The ions it introduces into the water increase the rate at which the plaster dissolves and then recrystallizes as gypsum.

Step 3: Group the substances that function as retarding agents. Based on the analysis, Cold water, Acetic acid, and Alcohol all slow down the setting of plaster. This corresponds to the combination (A), (C), and (D).

💡 Quick Tip

To remember plaster chemistry: "Heat and salt make it fast, cold and acid make it last."

61. Iconography defining Shiva as a 'Musician' (A) Holding 'veena' in right hand while sitting (B) Holding 'Damaru' in the left hand in sitting posture (C) Holding 'veena' with both the front hands in standing posture (D) Playing 'Sitar' in sitting position

Choose the **correct** answer from the options given below:

- (1) (A) and (B) only
- (2) (A) and (C) only
- (3) (B) and (C) only
- (4) (C) and (D) only

Correct Answer: (2) (A) and (C) only

Solution: Step 1: Identify the specific iconographic form of Shiva that represents him as a master of music and knowledge. This form is known as Vinadhara Dakshinamurti.

"Vinadhara" literally means "carrier of the Veena," and Dakshinamurti is Shiva's aspect as the supreme cosmic teacher of yoga, music, and wisdom. **Step 2:** Analyze the given options based on their adherence to this established iconography.

- (A) and (C): Both of these options describe Shiva holding the 'veena', which is the defining attribute (lakshana) of the Vinadhara form. Traditional iconography allows for this form to be depicted in various postures, including both sitting (asana) and standing (sthanaka). Therefore, both descriptions are iconographically correct for depicting Shiva as a musician.
- (B) Holding 'Damaru': The hourglass-shaped drum, or 'damaru', is the key attribute of Shiva in his form as Nataraja, the Lord of the Dance. The sound of the damaru represents the rhythm of creation and the primordial sound from which the universe emanates. It is not associated with his form as a melodic musician.
- (D) Playing 'Sitar': The sitar is a stringed instrument that evolved in the medieval period and gained prominence much later, around the 18th century. It is anachronistic and not part of the ancient, classical Hindu iconography for any deity, including Shiva.

Step 3: Determine the correct combination of options. The accurate iconographic representations of Shiva as a musician are those that show him with his traditional instrument, the veena. Therefore, options (A) and (C) are the correct choices.

💡 Quick Tip

Shiva as Musician = Vinadhara = Veena. Shiva as Dancer = Nataraja = Damaru. Associating the specific attribute (instrument) with the form is key.

62. Testimonies to adopting Persian stone carving techniques in India during the Mauryan period-

(A) Large three-dimensional figurative supports for the roof. (B) Independent edict pillars with bell-shaped capitals, surmounted by the animal figure. (C) Replica of wooden structures. (D) Cylindrical shapes in architectural structures.

Choose the **correct** answer from the options given below:

- (1) (A) and (C) only
- (2) (D) and (A) only
- (3) (A) and (B) only
- (4) (B) and (C) only

Correct Answer: (4) (B) and (C) only

Solution: Step 1: Identify the most distinctive and historically significant features of Mauryan period stonework that suggest foreign influence. **Step 2:** Analyze these features in the context of Achaemenid Persian art and architecture, which was the dominant imperial style to the west before the Mauryan empire's rise.

- (B) Independent edict pillars with bell-shaped capitals, surmounted by the animal figure: This is the strongest and most cited piece of evidence for Persian influence. The Mauryan pillars, with their monolithic shafts, highly polished surfaces (the "Mauryan polish"), distinct bell-shaped (or inverted lotus) capitals, and crowning animal sculptures, have direct stylistic and conceptual precedents in the pillars of the Achaemenid Persian palaces at Persepolis and Susa.
- (C) Replica of wooden structures: The sudden emergence of large-scale, sophisticated stone construction during the Mauryan period is believed to have been stimulated by contact with the Persian and Hellenistic worlds, where monumental stone architecture was long established. Mauryan rock-cut caves, for example, clearly replicate the forms and techniques of earlier wooden architecture. This technological leap from wood to stone on a monumental scale is considered a testimony to the adoption of foreign skills and ideas, even if the forms themselves were indigenous.

Step 3: Evaluate the other options. (A) Large figurative supports (caryatids) are more characteristic of Greek architecture, not a primary feature of Mauryan art. (D) Cylindrical shapes are too generic an architectural form to be specifically linked to Persian influence. Therefore, the most compelling evidence is the combination of the specific pillar design and the broader technological shift from wood to stone for monumental works.

💡 Quick Tip

The "Mauryan Polish" and the bell-shaped capital on Ashokan pillars are the classic textbook examples of Persian Achaemenid influence on Indian art.

63. Identify the sculptures of Kanayi Kunhiraman from the following- (A) The chariot of Sun (B) Yakshi, 1969 (C) Aattam, 1987 (D) Santhal Family
Choose the **correct** answer from the options given below:

- (1) (A) and (B) only
- (2) (B) and (C) only
- (3) (C) and (D) only
- (4) (D) and (A) only

Correct Answer: (2) (B) and (C) only

Solution: Step 1: Identify the artist Kanayi Kunhiraman and his significance in modern Indian art. Kunhiraman is a major sculptor from Kerala, celebrated for his large-scale, outdoor, and often site-specific sculptures that integrate with the natural landscape. **Step 2:** Attribute the artworks listed to their respective creators.

- (B) Yakshi (1969): This monumental, seated nude female figure, installed in the gardens of the Malampuzha Dam in Kerala, is Kunhiraman's most famous and iconic creation. Its bold form caused considerable controversy but cemented his reputation as a leading modernist.
- (C) Aattam (1987): This is another known work by Kanayi Kunhiraman, part of his extensive portfolio of public sculptures.

Step 3: Identify the creators of the other artworks to confirm they are not by Kunhiraman.

- (A) The Chariot of Sun: This is not a modern sculpture but a famous element of the 13th-century Sun Temple at Konark, a UNESCO World Heritage site.
- (D) Santhal Family (1938): This is a seminal masterpiece of modern Indian sculpture created by Ramkinkar Vaij at Santiniketan. It is celebrated for its use of concrete and its dynamic depiction of a tribal family.

Step 4: Conclude by grouping the works correctly attributed to Kanayi Kunhiraman. The sculptures from the list created by him are (B) Yakshi and (C) Aattam.

 Quick Tip

Kanayi Kunhiraman is synonymous with large-scale, outdoor sculptures in Kerala, with "Yakshi" at Malampuzha being his most recognized masterpiece.

64. Famous sculptures created in concrete by kanayi kunhiraman (A) A river carries its past (B) Lust (C) The conch (D) Sagarakanyaka

Choose the **correct** answer from the options given below:

- (1) (B) and (C) only
- (2) (A) and (B) only
- (3) (C) and (D) only
- (4) (D) and (A) only

Correct Answer: (3) (C) and (D) only

Solution: Step 1: Recall the signature style and materials of sculptor Kanayi Kunhiraman. He is renowned for creating monumental public art, often situated in natural or coastal landscapes in his home state of Kerala, and frequently uses concrete as his primary medium for these large-scale projects. **Step 2:** Evaluate the given options to identify his well-known concrete works.

- (C) The Conch (Shankum): This is a massive, iconic concrete sculpture of a conch shell located at the Veli Tourist Village in Thiruvananthapuram. It is one of his famous landmark pieces.
- (D) Sagarakanyaka (The Mermaid): This is another of his most celebrated works, a gigantic (over 87 feet long) concrete sculpture of a mermaid reclining on the shore at Shankumugham Beach in Thiruvananthapuram.

Step 3: Confirm the attribution. Both "The Conch" and "Sagarakanyaka" are two of Kunhiraman's most famous and easily identifiable monumental concrete sculptures, central to the landscape of Kerala's capital city. The other titles are not associated with his major works in this medium. **Step 4:** Determine the correct pairing. The correct combination of famous concrete sculptures by the artist is (C) and (D).

💡 Quick Tip

When you think of Kanayi Kunhiraman and concrete, think of the beaches of Thiruvananthapuram (Kerala's capital), where his famous "Mermaid" and "Conch" sculptures are major landmarks.

65. Group of the sculptures form the Neo-Classical era- (A) Antonio Canova (B) John Flaxman (C) Bertel Thorvaldsen (D) Gianlorenzo Bernini (E) Francois Duquesnoy
Choose the **correct** answer from the options given below:

- (1) (D) and (E) only
- (2) (A), (B) and (C) only
- (3) (B), (D) and (E) only
- (4) (A) and (E) only

Correct Answer: (2) (A), (B) and (C) only

Solution: Step 1: Define the Neo-Classical period and its core principles in sculpture. Flourishing from the late 18th to the early 19th century, Neo-Classicism was a reaction against the decorative excesses of Rococo and the dramatic intensity of the Baroque. It championed a return to the perceived purity and idealism of ancient Greek and Roman art, emphasizing clarity of form, noble simplicity, and calm grandeur. **Step 2:** Classify each artist according to their historical period and artistic style.

- (A) Antonio Canova (1757-1822): An Italian sculptor who was the most celebrated and dominant figure of the Neo-Classical movement. His work, like "Psyche Revived by Cupid's Kiss," is the epitome of the style's grace and idealized form.
- (B) John Flaxman (1755-1826): The leading English sculptor of his generation and a key proponent of Neo-Classicism, known for his elegant monuments and linear designs inspired by Greek vase painting.
- (C) Bertel Thorvaldsen (1770-1844): A Danish sculptor based in Rome who was considered Canova's great rival. His work, such as "Jason with the Golden Fleece," embodies the cool, heroic restraint of the high Neo-Classical style.
- (D) Gianlorenzo Bernini (1598-1680): The preeminent master of the Italian Baroque, a period that preceded Neo-Classicism by over a century. His sculptures, like "The Ecstasy of Saint Teresa," are characterized by dynamic movement, intense emotion, and dramatic theatricality—the very qualities Neo-Classicism reacted against.
- (E) Francois Duquesnoy (1597-1643): A Flemish sculptor active in Rome during the Baroque period. While his style was more restrained and classicizing than Bernini's, he is firmly a Baroque artist, not a Neo-Classicist.

Step 3: Group the artists who belong to the Neo-Classical era. The artists who are correctly identified as leaders of the Neo-Classical movement are Canova, Flaxman, and Thorvaldsen. This corresponds to the group (A), (B), and (C).

 Quick Tip

Neo-Classicism is a "return to the classics." Remember Canova and Thorvaldsen as the two giants of this movement. Bernini is the master of the earlier, much more dramatic and emotional Baroque style.

66. Match List-I with List-II

List-I	List-II
(A) Slip casting	(I) Silicon Carbide
(B) Pitcher	(II) Metal casting
(C) De-waxing	(III) Stone
(D) Crucible	(IV) Clay

Choose the **correct** answer from the options given below:

- (1) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)
- (2) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
- (3) (A)-(I), (B)-(III), (C)-(IV), (D)-(II)
- (4) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)

Correct Answer: (4) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)

Solution: Step 1: Analyze each term in List-I and find its direct and logical association in List-II.

- (A) Slip casting is a production method specific to ceramics, where a liquid suspension of clay in water, known as slip, is poured into a plaster mold. Therefore, (A) Slip casting directly matches with (IV) Clay.
- (B) A Pitcher is a type of heavy, single-beveled hammer used in the initial stages of masonry for the rough shaping of blocks. Therefore, (B) Pitcher matches with (III) Stone.
- (C) De-waxing is the critical step in investment casting where the wax model is melted out of the mold. This is done at high temperatures, requiring the mold to be made of a refractory material that can withstand the heat. (I) Silicon Carbide is a high-performance refractory ceramic, making it a suitable material for such molds.
- (D) A Crucible is a highly heat-resistant container used to hold and melt metals at extreme temperatures before they are poured into a mold. Therefore, (D) Crucible is fundamentally associated with (II) Metal casting.

Step 2: Formulate the correct sequence of matches based on the analysis. The correct pairings are (A)-(IV), (B)-(III), (C)-(I), and (D)-(II). This sequence corresponds to option (4).

 Quick Tip

Associate core terms with their fields: Slip -> Ceramics/Clay; Crucible -> Metal Casting; Pitcher -> Stone Masonry. De-waxing is part of casting, and the mold material must be heat-resistant.

67. Match List-I with List-II

List-I	List-II
(A) Plaster of Paris	(I) Calcium aluminum silicate
(B) Non-ferrous metal	(II) Bronze
(C) Cement	(III) Gold
(D) Alloy	(IV) Gypsum

Choose the **correct** answer from the options given below:

- (1) (A)-(IV), (B)-(II), (C)-(I), (D)-(III)
- (2) (A)-(II), (B)-(I), (C)-(III), (D)-(IV)
- (3) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)
- (4) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)

Correct Answer: (3) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)

Solution: Step 1: Match each material or term in List-I with its source material, chemical composition, or defining example in List-II.

- (A) Plaster of Paris is a building and sculpting material that is manufactured by heating the naturally occurring mineral (IV) Gypsum (calcium sulfate dihydrate) to drive off most of its water content.
- (B) A Non-ferrous metal is defined as any metal, including alloys, that does not contain iron (ferrum) in appreciable amounts. (III) Gold is a quintessential example of an elemental non-ferrous metal.
- (C) Cement, specifically Portland cement, is the primary binding agent in concrete. Its complex chemical composition is primarily based on hydraulic calcium silicates, with aluminates and ferrites, which can be generalized as (I) Calcium aluminum silicate compounds.
- (D) An Alloy is a substance made by melting two or more elements together, at least one of them a metal. (II) Bronze is a classic example of an alloy, primarily consisting of copper and tin.

Step 2: Assemble the correct pairings into a final sequence. The correct matches are (A)-(IV), (B)-(III), (C)-(I), and (D)-(II). This sequence matches option (3).

 Quick Tip

Break down material definitions: Plaster comes from Gypsum. Bronze is an Alloy. Gold is a non-ferrous element. Cement is a complex silicate.

68. Match List-I with List-II

List-I	List-II
(A) Gouge	(I) Metal Casting
(B) Claw chisel	(II) Stone carving
(C) Bush chisel	(III) Wood carving
(D) Core vent	(IV) Stone carving

Choose the **correct** answer from the options given below:

- (1) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)
- (2) (A)-(I), (B)-(III), (C)-(II), (D)-(IV)
- (3) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)
- (4) (A)-(I), (B)-(III), (C)-(II), (D)-(IV)

Correct Answer: (1) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)

Solution: Step 1: Identify the correct artistic medium or process associated with each tool or technical term listed in List-I.

- (A) A Gouge is a chisel with a concave, curved cutting edge. It is a fundamental tool used to create hollows, channels, and rounded forms specifically in (III) Wood carving.
- (B) A Claw chisel is a steel chisel with multiple teeth at the cutting edge. It is used in the initial stages of (II) Stone carving to rapidly remove material and establish the basic planes of the sculpture.
- (C) A Bush chisel is a type of texturing tool, often used with a bush hammer, that creates a pitted or roughened surface on stone. Therefore, its application is in (IV) Stone carving.
- (D) A Core vent is not a tool but a technical feature of a mold. It is a channel designed to allow gases to escape from the mold cavity as it fills with molten metal, which is essential for a sound casting. Thus, it is a term from (I) Metal Casting.

Step 2: Compile the sequence of correct pairings. The correct matches are (A)-(III), (B)-(II), (C)-(IV), and (D)-(I). This sequence corresponds to option (1).

💡 Quick Tip

Categorize tools by material: Gouges are for wood; Claw and Bush chisels are for stone. Terms like "core vent" and "sprue" are specific to casting processes.

69. Match List-I with List-II

List-I	List-II
(A) Gouge	(I) Stone carving
(B) Bush chisel	(II) Glass fiber casting
(C) Sprue	(III) Wood carving
(D) Gel Coat	(IV) Metal casting

Choose the **correct** answer from the options given below:

- (1) (A)-(I), (B)-(III), (C)-(II), (D)-(IV)
- (2) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
- (3) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)
- (4) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)

Correct Answer: (3) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)

Solution: Step 1: Determine the correct process or medium from List-II that corresponds to each tool or technical term in List-I.

- (A) A Gouge is a primary hand tool with a curved blade used for carving and shaping wood. Therefore, its correct association is with (III) Wood carving.
- (B) A Bush chisel is a texturing tool used to create a specific rough finish on the surface of stone. Thus, it belongs to the process of (I) Stone carving.
- (C) A Sprue is the channel or gate in a mold through which molten material is introduced. This term is fundamental to investment casting processes, including (IV) Metal casting.
- (D) A Gel Coat is a specialized layer of pigmented polyester resin applied to the inside of a mold as the first step in creating a fiberglass composite. It forms the smooth, colored, and protective outer surface of the final product. This term is specific to (II) Glass fiber casting.

Step 2: Assemble the correct sequence of matches. The correct pairings are (A)-(III), (B)-(I), (C)-(IV), and (D)-(II). This sequence corresponds to option (3).

💡 Quick Tip

Associate specific technical terms with their unique process: Gel Coat -> Fiberglass; Sprue -> Casting (Metal/Investment); Bush Chisel -> Stone; Gouge -> Wood.

70. Match List-I with List-II

List-I	List-II
(A) Softwood	(I) Cutting large timber
(B) Hardwood	(II) Pine
(C) Bow saw	(III) Oak
(D) Chisels and gouges	(IV) Carve the wood

Choose the **correct** answer from the options given below:

- (1) (A)-(II), (B)-(III), (C)-(I), (D)-(IV)
- (2) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)
- (3) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
- (4) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)

Correct Answer: (1) (A)-(II), (B)-(III), (C)-(I), (D)-(IV)

Solution: Step 1: Match each term from List-I, which includes wood types and tools, with its corresponding example or function from List-II.

- (A) Softwood is a botanical classification for wood from gymnosperm (coniferous) trees. (II) Pine is a classic and widely used example of a softwood.
- (B) Hardwood is the classification for wood from angiosperm (deciduous, broad-leaved) trees. (III) Oak is a quintessential example of a hardwood, known for its density and durability.
- (C) A Bow saw is a type of crosscut saw with a long blade held in tension by a metal frame. It is designed for powerful, rough cuts, making it ideal for (I) Cutting large timber, logs, and branches.
- (D) Chisels and gouges are the essential hand tools used for shaping and modeling wood in detail. Their primary function is to (IV) Carve the wood.

Step 2: Formulate the complete set of correct matches. The correct pairings are (A)-(II), (B)-(III), (C)-(I), and (D)-(IV). This sequence corresponds to option (1).

 Quick Tip

Separate the items into pairs of "category-example" (Softwood-Pine, Hardwood-Oak) and "tool-function" (Bow saw-Cutting, Chisels-Carving).

71. Match List-I with List-II

List-I	List-II
(A) D. P. Roy Chaudhury	(I) Copper
(B) P. V. Janakirama	(II) Hemp
(C) Meera Mukherjee	(III) Bronze
(D) Mrinalini Mukherjee	(IV) Dokra

Choose the **correct** answer from the options given below:

- (1) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)
- (2) (A)-(I), (B)-(III), (C)-(II), (D)-(IV)
- (3) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
- (4) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)

Correct Answer: (1) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)

Solution: Step 1: Connect each modern Indian sculptor from List-I with their most characteristic artistic medium or technique from List-II.

- (A) D. P. Roy Chaudhury was a master of academic realism and is best known for his monumental, dynamic public sculptures like the "Triumph of Labour." His preferred medium for these major works was (III) Bronze casting.
- (B) P. V. Janakiram, a key figure in the Madras Art Movement, developed a unique sculptural language by working with sheet metal. He used repoussé and welding techniques to create linear and stylized figures, primarily in (I) Copper and other sheet metals.

- (C) Meera Mukherjee was renowned for her innovative adaptation of an indigenous craft tradition for her modernist sculptures. She learned and masterfully employed the lost-wax casting technique of the (IV) Dokra artisans of Bastar.
- (D) Mrinalini Mukherjee stands out for her use of unconventional, organic materials. She created massive, sensuous, and abstract forms by painstakingly knotting and weaving dyed (II) Hemp ropes, a fiber she made her signature medium.

Step 2: Assemble the correct pairings into a single sequence. The correct matches are (A)-(III), (B)-(I), (C)-(IV), and (D)-(II). This sequence corresponds to option (1).

💡 Quick Tip

Associate each artist with their iconic material: Mrinalini -> Hemp; Meera -> Dokra; Janakiram -> Sheet Copper; D.P. Roy Chaudhury -> Bronze.

72. Match List-I with List-II

List-I	List-II
(A) Auger	(I) Cutting of waste material wood
(B) Fish tail gouge	(II) Drawing on the wood block
(C) Rip Saw	(III) Wood carving chisel
(D) Chalk	(IV) Drilling holes into wood

Choose the **correct** answer from the options given below:

- (1) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)
- (2) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)
- (3) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
- (4) (A)-(IV), (B)-(I), (C)-(III), (D)-(II)

Correct Answer: (2) (A)-(IV), (B)-(III), (C)-(I), (D)-(II)

Solution: Step 1: Match each woodworking tool or material from List-I with its specific function or description from List-II.

- (A) An Auger is a specialized drill bit featuring a helical screw blade. Its primary function is (IV) Drilling holes into wood, often of a large diameter and significant depth.
- (B) A Fish tail gouge is a specific profile of a (III) Wood carving chisel. It is characterized by a cutting edge that flares outwards from the shaft, resembling a fish's tail, making it useful for shaping and smoothing in tight corners.
- (C) A Rip Saw is a type of saw with teeth designed to cut wood efficiently parallel to the grain (ripping). This is the standard method for dimensioning boards or (I) Cutting of waste material wood along its length.
- (D) Chalk is a soft material used for marking temporary lines on a workpiece. Its function in woodworking is (II) Drawing on the wood block to lay out cuts or designs before proceeding with tools.

Step 2: Compile the correct sequence of matches based on the analysis. The correct pairings are (A)-(IV), (B)-(III), (C)-(I), and (D)-(II). This sequence corresponds to option (2).

 Quick Tip

Remember the main purpose of tools: Augers drill, Saws cut, Chisels carve, and Chalk marks.

73. Match List-I with List-II

List-I	List-II
(A) Brass	(I) Tin, Copper
(B) Bronze	(II) Silver
(C) Rubber molds	(III) Zinc, Copper
(D) Welding	(IV) Latex

Choose the **correct** answer from the options given below:

- (1) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)
- (2) (A)-(I), (B)-(III), (C)-(II), (D)-(IV)
- (3) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
- (4) (A)-(IV), (B)-(II), (C)-(III), (D)-(I)

Correct Answer: (1) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)

Solution: Step 1: Match each term in List-I with its correct definition, composition, or associated material from List-II.

- (A) Brass is a well-known metal alloy. Its principal components are (III) Zinc and Copper.
- (B) Bronze is another fundamental metal alloy. Its classic composition consists of (I) Tin and Copper.
- (C) Rubber molds, especially those valued for their high elasticity and ability to capture fine detail, are frequently made from natural rubber, which is derived from (IV) Latex.
- (D) Welding is a fabrication process to join materials. While it doesn't directly involve silver as a material, a related high-temperature joining process is brazing or soldering, which often uses alloys containing (II) Silver. In the context of the available choices, this is the intended, albeit slightly imprecise, association.

Step 2: Formulate the complete sequence of correct matches. The correct pairings are (A)-(III), (B)-(I), (C)-(IV), and (D)-(II). This sequence corresponds to option (1).

 Quick Tip

Memorize the basic alloys: Brass = Copper + Zinc. Bronze = Copper + Tin. Then match the remaining specialized terms.

74. Match List-I with List-II

List-I	List-II
(A) Lydia Mehta	(I) Dancer
(B) Ved Nayar	(II) Despair and hope of Kalpavriksha
(C) Mrinalini Mukherjee	(III) Vanshri
(D) Ratnabali Kant	(IV) Global Agony

Choose the **correct** answer from the options given below:

- (1) (A)-(II), (B)-(III), (C)-(I), (D)-(IV)
(2) (A)-(I), (B)-(IV), (C)-(III), (D)-(II)
(3) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)
(4) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

Correct Answer: (4) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)

Solution: Step 1: The task is to correctly associate each artist in List-I with the title of one of their specific artworks from List-II. This requires knowledge of major works by these modern and contemporary Indian sculptors.

- (A) Lydia Mehta is a sculptor whose body of work includes a piece titled (I) Dancer.
- (B) Ved Nayar is acclaimed for his conceptual installations, one of the most significant being (II) Despair and hope of Kalpavriksha, which addresses environmental and existential themes.
- (C) Mrinalini Mukherjee named many of her monumental hemp fiber sculptures with titles that evoke natural deities and primal forms. (III) Vanshri, which translates to 'Goddess of the Forest', is a prime example of her work and naming convention.
- (D) Ratnabali Kant is the artist who created the sculpture titled (IV) Global Agony.

Step 2: Assemble the sequence of correct artist-artwork pairings. The pairings are a direct one-to-one match as presented: (A) matches (I), (B) matches (II), (C) matches (III), and (D) matches (IV). This corresponds to option (4).

 Quick Tip

Linking artists to one of their most famous works is a key part of art history. Vanshri (Mrinalini Mukherjee) and Despair and hope... (Ved Nayar) are particularly important works to remember.

75. Match List-I with List-II

List-I	List-II
(A) Somnath Hore	(I) Woman
(B) Amar Nath Sehgal	(II) Sujata
(C) Ramkinkar Vaij	(III) Anguished Cries
(D) Dhan Raj Bhagat	(IV) Monarch

Choose the **correct** answer from the options given below:

- (1) (A)-(I), (B)-(III), (C)-(II), (D)-(IV)
- (2) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)
- (3) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
- (4) (A)-(IV), (B)-(II), (C)-(III), (D)-(I)

Correct Answer: (1) (A)-(I), (B)-(III), (C)-(II), (D)-(IV)

Solution: Step 1: Match each seminal modern Indian sculptor from List-I with one of their famous or representative artworks from List-II.

- (A) Somnath Hore's work is deeply humanistic, often focusing on themes of suffering, poverty, and resilience. His figural sculptures, such as one titled (I) Woman, embody these concerns with stark, expressive forms.
- (B) Amar Nath Sehgal's powerful bronze sculpture (III) Anguished Cries is one of the most poignant artistic responses to the violence and human tragedy of the Partition of India.
- (C) Ramkinkar Vaij was a trailblazer of modern Indian sculpture. Among his most celebrated outdoor sculptures at Santiniketan is the serene and graceful figure of (II) Sujata, depicting the woman who offered milk-rice to the Buddha.
- (D) Dhan Raj Bhagat developed a distinctive style that often fused geometric abstraction with inspirations from folk art and traditional motifs. His work (IV) Monarch is a well-known example of his sculptural practice.

Step 2: Formulate the complete sequence of correct matches. The correct pairings are (A)-(I), (B)-(III), (C)-(II), and (D)-(IV). This sequence corresponds to option (1).

 Quick Tip

Remember the masterpieces: Ramkinkar Vaij's "Sujata" and "Santhal Family," and Amar Nath Sehgal's "Anguished Cries" are cornerstone works of modern Indian sculpture.