UPCATET General Studies Sample Paper-7

Duration: 10 Minutes **Maximum Marks: 80**

Instructions

- This paper contains **20** Multiple Choice Questions.
- Each correct answer carries **+4** mark. Incorrect answer: **−1** marks. Only **one** correct option.
- Unattempted questions carry **0** marks.
- Use of mobile phones, smartwatches, or any electronic gadgets is strictly prohibited.

Q1. During the 1857 uprising, the revolutionary administration in Bareilly (Rohilkhand) was organized under Khan Bahadur Khan. Identify the highly unique structural administrative feature of this specific regional council that distinguished it from the Delhi or Lucknow rebel administrations.

(A) It completely abolished land revenue for all peasant classes for two years.

(B) It consisted of an equal representation of landlords and tenants called the *Majlis-e-Sura*.

(C) It maintained a formal committee of joint Hindu-Muslim revenue officers using a dual-signature treasury system to prevent communal rift.

(D) It functioned completely independent of the nominal suzerainty of Emperor Bahadur Shah Zafar.

Q2. The Terai-Bhabar geomorphic tract in northern Uttar Pradesh displays distinct hydrological characteristics. If a seasonal stream flows southward from the Shivalik foothills, select the correct sequence of sediment sorting and surface hydrology it encounters.

(A) Disappearance of surface water in unstratified boulders (Bhabar) → Re-emergence of water creating swampy conditions (Terai).

(B) Fine alluvial silt deposition (Terai) → Disappearance of water into highly porous gravel beds (Bhabar).

(C) Marshy water logging (Bhabar) → Sub-surface filtration into kankar formations (Terai).

(D) High velocity channel incision in Khadar plains → Terminal absorption in Bhangar high lands.

Q3. In the context of the medieval archaeological and architectural heritage of the Jaunpur Sultanate (Sharqi Dynasty), which structural element is characteristically absent from major monuments like the Atala Masjid, despite their massive monumental facades?

(A) Highly ornamented propylon gateways with battered walls.

(B) Conventional minarets flanking the main prayer hall.

(C) Arched cloisters with two-tiered colonnades.

(D) Square pillars utilizing Hindu temple architectural spoils.

Q4. The Sonbhadra district of Uttar Pradesh shares boundaries with four Indian states. From a geological perspective, the transition zone where the Vindhyan Supergroup meets the Mahakoshal (Granite-Greenstone) belt in this region is primarily sought after for which economic mineral assembly?

(A) High-grade Kimbersmith Diamond pipes.

(B) Hydrothermal Gold quartz veins and Andalusite complexes.

(C) Stratiform Sedimentary Manganese deposits.

(D) Cryogenic Pegmatite Lithium formations.

Q5. Consider the historical evolution of land tenure systems in colonial United Provinces (Agra and Oudh). The passing of the Oudh Rent Act of 1886 and its later 1921 amendment primarily attempted to suppress rural unrest by addressing which critical systemic grievance?

(A) Complete abolition of the statutory *Talukdari* ownership rights.

(B) Granting statutory life-tenancy rights to arbitrary *Nazrana* victims to limit reckless evictions.

(C) Introduction of the Ryotwari assessment matrices directly to individual Oudh cultivators.

(D) Legalizing the conversion of agricultural produce rents (*Batai*) into fixed metallic currency values.

Q6. An agricultural scientist measures the soil-water potential (Ψ_w) matrix across a root-soil boundary layer. If the atmospheric relative humidity drops sharply, causing accelerated transpiration, select the mathematically and physically accurate thermodynamic gradient necessary for continuous water uptake by the plant roots without cavitating xylem vessels.

(A) $\Psi_{\text{atmosphere}} > \Psi_{\text{leaf}} > \Psi_{\text{root}} > \Psi_{\text{soil}}$

(B) $\Psi_{\text{soil}} > \Psi_{\text{root}} > \Psi_{\text{leaf}} > \Psi_{\text{atmosphere}}$

(C) $\Psi_{\text{soil}} = \Psi_{\text{root}} = \Psi_{\text{leaf}} = \Psi_{\text{atmosphere}}$

(D) $\Psi_{\text{root}} > \Psi_{\text{soil}} > \Psi_{\text{atmosphere}} > \Psi_{\text{leaf}}$

Q7. A chemical solution undergoes an environmental degradation study where a pollutant decomposes via pseudo-first-order kinetics. If the initial concentration $[A]_0$ is halved in 30 minutes, calculate the total time required for the pollutant concentration to drop to exactly 12.5% of its original value.

(A) 60 minutes

(B) 90 minutes

(C) 120 minutes

(D) 240 minutes

Q8. In a highly eutrophic freshwater ecosystem lake in Uttar Pradesh, a sudden massive cyanobacterial algal bloom dies off. Identify the biochemical cascades that immediate follow this die-off event and their ultimate impact on dissolved oxygen (DO) and biochemical oxygen demand (BOD).

(A) Aerobic decomposers multiply rapidly $\rightarrow$ DO crashes sharply $\rightarrow$ BOD skyrockets.

(B) Photosynthetic efficiency increases → DO skyrockets → BOD crashes to zero.

(C) Anaerobic fixation fixes free carbon → DO remains stable → BOD diminishes.

(D) Autotrophic nitrification creates nitrates → DO increases → BOD stabilizes.

Q9. A biological assay focuses on the efficiency of the C4 photosynthetic pathway in plants like Sugarcane and Maize. Why do C4 plants exhibit a near-zero rate of photorespiration compared to normal C3 crops under high temperature and low atmospheric CO_2 conditions?

(A) They utilize PEP carboxylase, which has a high affinity for O_2 instead of CO_2.

(B) They spatially separate initial CO_2 fixation in mesophyll cells from RuBisCO operation in bundle-sheath cells, maintaining high local CO_2 concentration.

(C) They temporally isolate light reactions to nighttime hours while closing stomata completely during daytime heat.

(D) They bypass the Calvin cycle completely, producing glucose via direct reduction of malic acid.

Q10. Under the provisions of Article 356 of the Constitution of India, a Proclamation of President's Rule in a state is issued. If both Houses of Parliament approve the proclamation within the stipulated period, but the Lok Sabha dissolves before the expiry of its maximum permitted operational window without further action, what is the exact legal status of the Proclamation?

(A) The Proclamation lapses immediately upon the day the Lok Sabha is formally dissolved.

(B) The Proclamation continues to operate for a maximum period of 6 months from the date of its approval, irrespective of Lok Sabha's early dissolution.

(C) The Proclamation shifts automatically under the direct judicial custody of the Supreme Court of India.

(D) The Proclamation becomes permanently valid until revoked by a joint sitting of the newly elected Parliament.

Q11. An economic model analyzes the impacts of expansionary monetary policies when an economy faces a classic liquidity trap scenario. According to Keynesian macroeconomic parameters, if the central bank injections of liquidity fail to lower interest rates any further, what happens to the elasticity of demand for money and the velocity of money circulation?

(A) Elasticity of money demand becomes perfectly inelastic; velocity approaches infinity.

(B) Elasticity of money demand becomes perfectly elastic; velocity drops to near zero.

(C) Elasticity of money demand is completely unaffected; velocity stabilizes linearly.

(D) Elasticity of money demand becomes unit elastic; velocity matches the GDP growth rate.

Q12. The historic 1969 nationalization of 14 major commercial banks in India was executed under the Banking Companies (Acquisition and Transfer of Undertakings) Ordinance/Act. What was the exact quantitative criterion used to select those specific banks for nationalization?

(A) Banks possessing total credit outstanding exceeding 100 crores.

(B) Banks possessing total deposits of not less than 50 crores.

(C) Banks having more than 500 working rural branches across India.

(D) Banks exhibiting an asset-to-liability deficit ratio greater than 12%.

Q13. In the context of the federal financial architecture of India, the 73rd and 74th Constitutional Amendment Acts mandate State Finance Commissions to make structural recommendations to the Governor. What is the explicit target objective of these recommendations?

(A) Principles governing the distribution of net proceeds of taxes between the State Government and the Panchayats/Municipalities.

(B) Allocations of central plan assistance packages among different backward tribal development blocks.

(C) Establishing independent financial dispute resolution tribunals between neighboring districts.

(D) The total cap limits of external commercial borrowings that a local self-government can raise from international banks.

Q14. The geographical indication (GI) tag system protects indigenous art crafts. Identify the correct match linking the highly specific craft of Uttar Pradesh to its unique traditional raw material or core production methodology.

(A) Nizamabad Black Pottery → Direct application of silver-zinc alloy inlay into deep incisions.

(B) Mirzapur Handmade Dari → Exclusive utilization of mulberry silk yarn treated with organic indigo vats.

(C) Gorakhpur Terracotta → Use of local clay baked with specialized indigenous natural soda-soil glazing techniques without chemical pigments.

(D) Kannauj Perfume → High-pressure dry fractional extraction of essential oils using synthetic petroleum ethers.

Q15. In the structural organization of major multi-sport global events, the International Olympic Committee (IOC) added new sports disciplines like Sport Climbing, Surfing, and Skateboarding to the permanent Olympic framework. Which core strategic initiative of the IOC dictated this structural inclusion to modernize Olympic viewership metrics?

(A) Olympic Agenda 2020 + 5

(B) Vision 2030 Global Athletics Pact

(C) Lausanne Protocol on Extreme Sports

(D) The Stockholm Environmental Action Plan

Q16. A major cultural repository project in India has recently focused on mapping and digitizing rural cultural heritage assets through a national public-participation framework known as 'Mera Gaon, Meri Dharohar'. Which administrative union ministry is executing this massive digital documentation project?

(A) Ministry of Rural Development

(B) Ministry of Culture

(C) Ministry of Electronics and Information Technology

(D) Ministry of Tourism

Q17. The Reserve Bank of India has operationalized its Central Bank Digital Currency (CBDC) known as the e-Rupee (e-₹). Identify the specific architectural feature of the retail e-Rupee (e-R) that distinguishes its accounting holding format from conventional commercial bank digital money transfers.

(A) It represents an indirect claim on commercial banks requiring mandatory centralized clearing house settlement.

(B) It is an interest-bearing token account directly linked to the user's sovereign equity portfolio.

(C) It is a digital token representing a direct sovereign liability of the central bank, acting as a digital equivalent of physical currency notes without requiring bank intermediation for final settlement clearance.

(D) It operates on a completely anonymous, unencrypted decentralized open-ledger network that bypasses KYC parameters.

Q18. In computing networks and data storage systems, an engineer calculates error detection and correction matrices. If a system uses a classic Hamming Code block layout to detect and automatically correct a single-bit error within a transmitted data byte, what is the absolute minimum number of parity bits required to be embedded within the data stream?

(A) 2 parity bits

(B) 3 parity bits

(C) 4 parity bits

(D) 5 parity bits

Q19. Consider the underlying architectural pipeline execution inside a modern Central Processing Unit (CPU). When the CPU executes instructions, it occasionally

faces a 'Control Hazard'. Identify the scenario below that triggers this specific micro-architectural hazard.

(A) Two instructions require access to the same physical memory register bank at the same clock cycle.

(B) An instruction depends on the numerical result of a previous instruction that has not completed its write-back phase.

(C) The pipeline encounters a conditional branch instruction and cannot accurately determine the next target instruction address to fetch.

(D) The cache memory controller encounters a complete L1/L2 cache miss cycle.

Q20. A network security administrator investigates an unauthorized system breach on a Local Area Network (LAN). The administrator discovers that a malicious host is continuously broadcasting fraudulent Address Resolution Protocol replies to the network switch. These replies link the IP address of the default gateway router with the physical MAC address of the attacker's own network interface card, forcing legitimate client traffic to route through the attacker's node before reaching its destination. Identify this specific network layer attack vector.

(A) DNS Cache Poisoning

(B) ARP Spoofing / Poisoning

(C) BGP Route Hijacking

(D) ICMP Flood Attack

Detailed Solutions

Q1.

Solution

Concept: During the 1857 Uprising, the rebel administration established under Khan Bahadur Khan Rohilla in Bareilly organized a highly specific administrative machinery designed to maintain local multi-religious solidarity and handle financial administration effectively under extreme wartime duress.

Solution:

Let's analyze the distinct administrative features of the Bareilly rebel council:

(a) Unlike some regions that suffered heavily from sectarian infighting, Khan Bahadur Khan deliberately unified the local population by appointing an integrated administrative council.

(b) To ensure absolute transparency and build confidence between communities, the Bareilly administration established a **formal committee of joint Hindu-Muslim revenue officers using a dual-signature treasury system**.

(c) For example, prominent Hindu leaders like Sobha Ram were appointed as Chief Ministers alongside Muslim administrators, and financial outlays or tax assessments required verification across communities to prevent communal rifts.

(d) This stood in sharp contrast to the highly chaotic structural matrices of the central court at Delhi or the complex taluqdari arrangements under Begum Hazrat Mahal in Lucknow.

Final Answer: It maintained a formal committee of joint Hindu-Muslim revenue officers using a dual-signature treasury system to prevent communal rift.

Answer: (C)

Go Back to Question 1

Q2.

Solution

Concept: The piedmont zone of northern Uttar Pradesh features a distinct geomorphic transition where water drainage behaves in a highly unique manner due to abrupt changes in slope and sediment size.

Solution:

Let's trace the hydrological and sediment sequence from north to south:

(a) As seasonal streams rush southward from the steep outer Shivalik foothills, they lose velocity instantly upon hitting the flat plains.

(b) This loss of kinetic energy forces them to drop their heaviest load first, creating the **Bhabar** belt. The Bhabar is composed of **unstratified boulders**, heavy gravels, and porous scree.

(c) Because this boulder layer is incredibly porous, surface water completely sinks underground, causing the **disappearance of surface water** into the subsurface channels.

(d) The water travels underground along the bedrock gradient until it encounters the fine-grained, less permeable alluvial clay and silt of the **Terai** belt. Here, the water is forced back up, leading to the **re-emergence of water** and creating perennially marshy, swampy conditions.

Final Answer: Disappearance of surface water in unstratified boulders (Bhabar) → Re-emergence of water creating swampy conditions (Terai).

Answer: (A)

Go Back to Question 2

Q3.

Solution

Concept: The Sharqi architecture of the Jaunpur Sultanate (1394–1479 CE) developed a highly unique style of Indo-Islamic architecture, blending local indigenous construction methods with Islamic design motifs.

Solution:

Let's examine the architectural elements of major Sharqi monuments like the Atala Masjid:

(a) Sharqi monuments are world-famous for their massive, imposing facades characterized by **highly ornamented propylon gateways with battered (sloping) walls** and arched cloisters utilizing salvaged architectural columns.

(b) However, a key defining layout feature of the Jaunpur style is the **complete absence of conventional minarets** flanking the main prayer hall or gateway.

(c) Instead of using freestanding minarets for the call to prayer, the architects relied entirely on the massive central propylons and tapered square bastions built into the external corners of the mosque walls to provide structural balance and height.

Final Answer: Conventional minarets flanking the main prayer hall.

Answer: (B)

Go Back to Question 3

Q4.

Solution

Concept: The Sonbhadra district, located in the southeastern tip of Uttar Pradesh, marks a highly complex tectonic junction where the Proterozoic Vindhyan Supergroup meet the Archean-Proterozoic Mahakoshal Granite-Greenstone belt.

Solution:

Let's identify the dominant economic mineral assembly of this geological transition zone:

(a) Greenstone belts worldwide are intensely studied for structural shear zones that host valuable metals.

(b) In Sonbhadra (particularly around zones like Son Pahari and Hardi), the Mahakoshal belt features extensive structural fractures filled with **hydrothermal gold-quartz veins**.

(c) Additionally, regional low-grade metamorphism of aluminous pelitic rocks in this contact zone has generated extensive deposits of **andalusite complexes** (Al_2SiO_5), a highly sought-after refractory industrial mineral.

Final Answer: Hydrothermal Gold quartz veins and Andalusite complexes.

Answer: (B)

Go Back to Question 4

Q5.

Solution

Concept: Following the Annexation of Oudh in 1856 and the subsequent 1857 Uprising, the British consolidated power by returning land control to loyal *Taluqdars* (landlords), which left the actual peasant cultivators highly vulnerable to exploitation.

Solution:

Let's analyze the legislative intent behind the Oudh Rent Acts:

(a) Under the Taluqdari system, tenants lacked occupancy rights and were subjected to arbitrary evictions and heavy forced premiums called **Nazrana**. This created deep agrarian unrest, leading to radical peasant movements.

(b) To address these critical grievances and pacify the countryside, the colonial government passed the **Oudh Rent Act of 1886**.

(c) The Act, along with its 1921 amendment, attempted to check reckless evictions by **granting statutory tenancy privileges** to tenants. This extended their lease terms (initially to 7 years, and later to statutory life tenancies) and regulated random rent hikes, protecting peasants from arbitrary exploitation.

Final Answer: Granting statutory life-tenancy rights to arbitrary *Nazrana* victims to limit reckless evictions.

Answer: (B)

Go Back to Question 5

Q6.

Solution

Concept: Water movement throughout the soil-plant-atmosphere continuum (SPAC) operates as a passive thermodynamic process driven exclusively by a gradient of total water potential (Ψ_w).

Solution:

Let's analyze the physics of water potential gradients:

(a) Water always flows spontaneously from an area of higher water potential (less negative, closer to 0 MPa) to an area of lower water potential (more negative).

(b) For a plant to continuously extract water from the soil and move it up through its xylem vessels to evaporate out of leaf stomata, there must be a continuous downward gradient across the system:

$$\Psi_{soil} > \Psi_{root} > \Psi_{leaf} > \Psi_{atmosphere}$$

(c) When atmospheric humidity drops sharply, $\Psi_{atmosphere}$ becomes deeply negative (often reaching -100 MPa). This steep drop pulls water through the leaf, down the gradient, ensuring continuous uptake from the soil without breaking the cohesive water column inside the xylem.

Final Answer: $\boxed{\Psi_{soil} > \Psi_{root} > \Psi_{leaf} > \Psi_{atmosphere}}$

Answer: (B)

Go Back to Question 6

Q7.

Solution

Concept: In first-order and pseudo-first-order chemical reactions, the half-life ($t_{1/2}$) is a constant value that depends only on the reaction rate constant, remaining entirely independent of the starting concentration.

Solution:

Let's calculate the total time using half-life intervals:

(a) The prompt states that the initial concentration $[A]_0$ is halved in 30 minutes. This means the half-life ($t_{1/2}$) of the pollutant is exactly **30 minutes**.

(b) Let's track the concentration remaining after successive half-life intervals:

- After 1 half-life (30 mins): 50% of $[A]_0$ remains.
- After 2 half-lives (60 mins): 25% of $[A]_0$ remains.
- After 3 half-lives (90 mins): 12.5% of $[A]_0$ remains.

(c) Thus, it takes exactly 3 consecutive half-life cycles for the pollutant concentration to drop to 12.5% of its original baseline.

$$\text{Total Time} = 3 \times 30 \text{ minutes} = 90 \text{ minutes}$$

Final Answer: 90 minutes

Answer: (B)

Go Back to Question 7

Q8.

Solution

Concept: Eutrophication occurs when an oversupply of nutrients (like nitrates and phosphates) triggers rapid growth of cyanobacteria or green algae. The sudden death of this massive biomass alters the chemical balance of the aquatic ecosystem.

Solution:

Let's look at the biochemical cascade that follows an algal bloom crash:

(a) When a massive cyanobacterial bloom dies, a vast amount of dead organic matter accumulates in the water column.

(b) **Aerobic heterotrophic decomposers** (bacteria and fungi) multiply exponentially to break down this organic matter.

(c) These decomposers consume oxygen for cellular respiration, causing dissolved oxygen (DO) levels to crash sharply.

(d) Because the decomposers require massive amounts of oxygen to break down the organic waste, the **Biochemical Oxygen Demand (BOD)** skyrockets, creating an anoxic environment that can cause widespread fish kills.

Final Answer: Aerobic decomposers multiply rapidly → DO crashes sharply → BOD skyrockets.

Answer: (A)

Go Back to Question 8

Q9.

Solution

Concept: Photorespiration occurs when the enzyme RuBisCO fixes oxygen (O_2) instead of carbon dioxide (CO_2), a wasteful process that increases under high temperatures and low internal CO_2 conditions.

Solution:

Let's look at how C_4 plants suppress photorespiration:

(a) C_4 plants have evolved a specialized internal cell layout known as **Kranz anatomy**.

(b) They **spatially separate** initial carbon fixation from the Calvin cycle. Initial carbon capture occurs in the outer mesophyll cells using PEP-carboxylase, an enzyme with no affinity for oxygen.

(c) This fixed carbon is converted into four-carbon organic acids (like malate) and transported into the inner **bundle-sheath cells**.

(d) Inside the bundle-sheath cells, these acids are broken down to release concentrated CO_2 directly around RuBisCO. This high local concentration ensures RuBisCO fixes carbon efficiently and avoids interacting with oxygen, reducing photorespiration to near zero.

Final Answer: They spatially separate initial CO_2 fixation in mesophyll cells from RuBisCO operation in bundle-sheath cells, maintaining high local CO_2 concentration.

Answer: (B)

Go Back to Question 9

Q10.

Solution

Concept: Article 356 of the Constitution of India contains provisions for the proclamation of President's Rule in a state when its constitutional machinery breaks down.

Solution:

Let's analyze the statutory limits and parliamentary rules governing Article 356:

(a) A proclamation of President's Rule must be approved by both Houses of Parliament within two months of its issuance.

(b) Once approved by both the Rajya Sabha and the Lok Sabha, the proclamation gains legal validity to operate for a **maximum period of six months** from the date of its issuance.

(c) If the Lok Sabha is dissolved *after* granting formal approval but during that six-month operational window, the proclamation does not automatically lapse. It remains valid until the expiration of that approved six-month period, unless revoked earlier by the President.

Final Answer: The Proclamation continues to operate for a maximum period of 6 months from the date of its approval, irrespective of Lok Sabha's early dissolution.

Answer: (B)

Go Back to Question 10

Q11.

Solution

Concept: A liquidity trap is an extreme macroeconomic condition where nominal interest rates fall to near zero, leaving conventional monetary expansions unable to stimulate economic growth.

Solution:

Let's analyze money demand parameters within a liquidity trap:

(a) When interest rates are extremely low, bond prices are at historic highs. Investors expect interest rates must rise in the future, which would cause bond values to fall.

(b) Consequently, investors prefer holding cash over bonds, making the **elasticity of money demand perfectly elastic** (the speculative money demand curve becomes completely flat).

(c) Because any new liquidity injected by the central bank is hoarded as cash rather than spent or invested, the **velocity of money circulation drops to near zero**, rendering monetary policy ineffective.

Final Answer: Elasticity of money demand becomes perfectly elastic; velocity drops to near zero.

Answer: (B)

Go Back to Question 11

Q12.

Solution

Concept: The nationalization of commercial banks in 1969 was a landmark structural shift in India's banking history, aimed at redirecting credit toward priority sectors like agriculture and small-scale industries.

Solution:

Let's identify the selection criteria used during this policy shift:

(a) To maximize the impact of state control, Indira Gandhi's administration targeted the largest private commercial banking institutions operating across the country.

(b) The Banking Companies Ordinance of 1969 established a strict quantitative baseline for selection.

(c) The law targeted all major private commercial banks **possessing total deposits of not less than 50 crores** at that time. This specific cutoff led to the nationalization of 14 major banks, placing roughly 85% of India's total banking deposits under state control.

Final Answer: Banks possessing total deposits of not less than 50 crores.

Answer: (B)

Go Back to Question 12

Q13.

Solution

Concept: Articles 243-I and 243-Y of the Constitution of India mandate the establishment of a State Finance Commission (SFC) every five years to review the financial position of local self-governments.

Solution:

Let's isolate the primary constitutional objective of an SFC:

(a) The SFC is designed to reinforce fiscal decentralization to rural and urban local bodies.

(b) Its primary constitutional mandate is to lay down the **principles governing the distribution of net proceeds of taxes** between the State Government and local bodies (Panchayats and Municipalities).

(c) It also recommends guidelines for determining grants-in-aid to local bodies from the Consolidated Fund of the State and suggests measures to strengthen the financial health of local governments.

Final Answer: Principles governing the distribution of net proceeds of taxes between the State Government and the Panchayats/Municipalities.

Answer: (A)

Go Back to Question 13

Q14.

Solution

Concept: Geographical Indication (GI) certifications protect traditional handicrafts and agricultural goods by verifying that their unique qualities are directly tied to regional raw materials and heritage production techniques.

Solution:

Let's verify the production descriptions for these crafts:

(a) Nizamabad pottery relies on smoke reduction firing, not metal alloys. Kannauj perfume uses traditional hydro-distillation into sandalwood oil baselines, avoiding synthetic ethers.

(b) **Gorakhpur Terracotta** is a certified craft tradition that relies entirely on an unblended local clay gathered from regional ponds.

(c) The artisans shape pieces by hand and bake them in traditional open kilns using local fuels. They use a specialized **indigenous natural soda-soil glazing technique** (known as *Kabra* or *Sajhi* soil) to finish the pieces, giving them a distinct, durable reddish-orange tint without using any modern chemical pigments.

Final Answer: Gorakhpur Terracotta → Use of local clay baked with specialized indigenous natural soda-soil glazing techniques without chemical pigments.

Answer: (C)

Go Back to Question 14

Q15.

Solution

Concept: The International Olympic Committee (IOC) continuously updates its sports program to ensure the Olympic Games remain relevant to younger generations and attractive to global broadcasting markets.

Solution:

Let's trace the strategic policy framework behind these additions:

(a) At the 127th IOC Session, the committee adopted **Olympic Agenda 2020** (later updated to **Olympic Agenda 2020+5**).

(b) This strategic roadmap overhauled the rules for building the sports program, shifting from a sport-based system to an event-based model and allowing host cities to propose new sports for their editions.

(c) Under this framework, youth-focused, urban, and action disciplines like Sport Climbing, Surfing, and Skateboarding were integrated into Tokyo 2020 and subsequent Games to modernize viewership metrics and connect with younger audiences.

Final Answer: Olympic Agenda 2020 + 5

Answer: (A)

Go Back to Question 15

Q16.

Solution

Concept: The "Mera Gaon, Meri Dharohar" (My Village, My Heritage) initiative is a major national project launched under the National Mission on Cultural Mapping to document and preserve India's diverse rural heritage.

Solution:

Let's identify the administrative ministry running this project:

(a) While the project maps rural regions, it is not run by the Ministry of Rural Development.

(b) The program is executed exclusively by the **Ministry of Culture** in collaboration with the Indira Gandhi National Centre for the Arts (IGNCA).

(c) The project uses a public participation model to create a comprehensive digital repository detailing the cultural practices, historical monuments, traditional crafts, and local lore of over 6.5 lakh villages across India.

Final Answer: Ministry of Culture

Answer: (B)

Go Back to Question 16

Q17.

Solution

Concept: Central Bank Digital Currency (CBDC), known as the e-Rupee, is a digital token format of fiat currency issued directly by the Reserve Bank of India.

Solution:

Let's analyze the structural differences between retail CBDC and commercial bank money:

(a) Conventional digital transfers (via NEFT or UPI) move commercial bank book liabilities, requiring centralized clearing houses to settle accounts between banks.

(b) The retail e-Rupee (e-R) is designed as a **digital token representing a direct sovereign liability of the central bank**.

(c) It acts as the digital equivalent of physical paper currency notes. Transactions settle peer-to-peer instantly between digital wallets without requiring commercial bank intermediation or clearing houses for final settlement clearance.

Final Answer: It is a digital token representing a direct sovereign liability of the central bank, acting as a digital equivalent of physical currency notes without requiring bank intermediation for final settlement clearance.

Answer: (C)

Go Back to Question 17

Q18.

Solution

Concept: Hamming codes are a family of linear error-correcting codes that insert redundant parity bits into a data stream to locate and correct single-bit errors.

Solution:

Let's use the Hamming rule to calculate the required parity bits:

(a) The relationship between the number of data bits (m) and parity bits (p) is governed by the Hamming rule inequality:

$$2^p \geq m + p + 1$$

(b) The prompt states we are processing a standard data byte, which means the number of data bits $m = 8$.

(c) Let's test different values for p to satisfy the inequality:

- If $p = 3$: $2^3 = 8$, and $8 + 3 + 1 = 12$. Since $8 \ngeq 12$, 3 bits are insufficient.
- If $p = 4$: $2^4 = 16$, and $8 + 4 + 1 = 13$. Since $16 \geq 13$, the inequality is satisfied.

(d) Thus, a minimum of **4 parity bits** must be embedded into an 8-bit data byte (creating a 12-bit block) to successfully detect and correct a single-bit error.

Final Answer: 4 parity bits

Answer: (C)

Go Back to Question 18

Q19.

Solution

Concept: Pipeline hazards occur in modern CPU architectures when the next instruction cannot execute in its designated clock cycle, stalling the execution pipeline.

Solution:

Let's distinguish between the primary types of pipeline hazards:

(a) *Structural Hazards* occur when hardware resource conflicts arise because two instructions need the same physical component at once.

(b) *Data Hazards* happen when an instruction depends on the data results of a preceding instruction that has not completed its write-back phase.

(c) **Control Hazards** (or branch hazards) occur when **the pipeline encounters a conditional branch instruction** (like an `if` statement or loop). Because the CPU cannot immediately determine the next target instruction address until the branch condition is evaluated, it cannot confidently fetch the next instruction, stalling the pipeline.

Final Answer: The pipeline encounters a conditional branch instruction and cannot accurately determine the next target instruction address to fetch.

Answer: (C)

Go Back to Question 19

Q20.

Solution

Concept: The Address Resolution Protocol (ARP) maps a network layer IP address to a link layer physical MAC address on local area networks, operating without built-in verification parameters.

Solution:

Let's analyze the mechanics of the reported local area network attack:

(a) Because standard ARP lacks authentication, hosts accept incoming ARP replies even if they never sent a corresponding request.

(b) In an **ARP Spoofing / Poisoning** attack, an attacker broadcasts fraudulent ARP replies across the network segment.

(c) These fake messages trick client devices into linking the default gateway's IP address with the attacker's physical MAC address.

(d) This reroutes local traffic through the attacker's machine before it travels to the external internet, allowing the attacker to intercept, inspect, or modify the data packets (a Man-in-the-Middle attack vector).

Final Answer: ARP Spoofing / Poisoning

Answer: (B)

Go Back to Question 20

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	C	2	A	3	B	4	B	5	B
6	B	7	B	8	A	9	B	10	B
11	B	12	B	13	A	14	C	15	A
16	B	17	C	18	C	19	C	20	B