# UGC NET Paper 1 Jan 05, 2026 Shift 2 Memory Based Test

**Q1.** Arrange the following international environmental agreements in the chronological order of their adoption:
i. Paris Agreement
ii. Montreal Protocol
iii. Kyoto Protocol
iv. Convention on Biological Diversity (CBD)
Codes:
(a) ii, iv, iii, i
(b) ii, iii, iv, i
(c) iv, ii, i, iii
(d) iii, ii, i, iv
Answer:
A
Sol:
Correct Option – (a)
Introduction:

- The global community has responded to transboundary environmental issues through a series of landmark multilateral agreements
- These treaties represent evolving efforts to foster cooperation on shared challenges like climate change, ozone depletion, and biodiversity loss.

Information Booster:

- The correct chronological order is:
- Montreal Protocol (1987): Adopted to protect the ozone layer by phasing out the production of numerous substances responsible for ozone depletion, such as chlorofluorocarbons (CFCs).
- It is considered one of the most successful international environmental agreements.
- Convention on Biological Diversity (CBD) (1992): Opened for signature at the Earth Summit in Rio de Janeiro (1992).
- Its objectives are the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from genetic resources.
- Kyoto Protocol (1997): An international treaty that extended the 1992 UN Framework Convention on Climate Change (UNFCCC).
- It committed industrialized countries and economies in transition (Annex I parties) to limit and reduce greenhouse gas emissions based on agreed individual targets. It operationalized the concept of "common but differentiated responsibilities."
- Paris Agreement (2015): The most recent major climate agreement under the UNFCCC. Its central aim is to strengthen the global response to climate change by keeping global temperature rise well below 2°C above pre-industrial levels.
- Unlike the Kyoto Protocol, it requires climate action commitments from all countries, not just developed ones.
- The Kigali Amendment (2016) to the Montreal Protocol is a significant recent update, aiming to phase down the production and consumption of hydrofluorocarbons (HFCs), potent greenhouse gases.

- The Nagoya Protocol (2010) is a supplementary agreement to the CBD focusing on access to genetic resources and benefit-sharing.

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**Q2.** How does altitude generally affect vegetation?
(a) Vegetation increases with increasing altitude.
(b) Vegetation remains constant with changes in altitude.
(c) Vegetation decreases with increasing altitude.
(d) Vegetation is unaffected by altitude.
Answer:
C
Sol:
As altitude increases, temperatures generally decrease. Cooler temperatures at higher altitudes can inhibit the growth of many plant species that thrive in warmer conditions found at lower elevations. Higher altitudes often have shorter growing seasons due to lower temperatures and increased frost occurrences. This limits the time available for plants to grow and reproduce. Plants at higher altitudes are more exposed to strong winds, higher UV radiation, and less soil moisture, all of which can stress plant life and reduce vegetation density. Vegetation zones typically shift with altitude. For example, dense forests found at lower altitudes gradually give way to mountain forests with shrubs and grasses, and eventually to alpine meadows and tundra at very high elevations.

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**Q3.** Which of the following diseases are caused by atmospheric particulate matters?
A. Asthma
B. Melanoma
C. Dry Eye Syndrome
D. Bronchitis
E. Chronic Obstructive Pulmonary Diseases (COPD)
Choose the correct answer from the options given below:
(a) A, B, C and D only
(b) B, C, D and E only
(c) A, C, D and E only
(d) A, B, D and E only
Answer:
C
Sol:
Atmospheric particulate matter, commonly referred to as air pollution, can cause or exacerbate a variety of respiratory and ocular conditions. Asthma (A), Dry Eye Syndrome (C), Bronchitis (D), and Chronic Obstructive Pulmonary Diseases (COPD) (E) are all conditions that can be caused or worsened by exposure to particulate matter in the air.
Asthma: Asthma is a chronic respiratory condition characterized by inflammation and narrowing of the airways, leading to difficulty breathing. Exposure to atmospheric particulate matter, such as dust, pollen, and pollutants, can trigger asthma attacks and worsen symptoms in individuals with asthma. Fine particles can penetrate deep into the lungs, causing inflammation and exacerbating existing respiratory issues.

Dry Eye Syndrome: Dry Eye Syndrome occurs when the eyes do not produce enough tears or when the tears evaporate too quickly, leading to irritation and discomfort. Airborne particulate matter, such as dust, smoke, and other pollutants, can contribute to the development of Dry Eye Syndrome by irritating the eyes and disrupting the tear film. This can cause symptoms like redness, itching, and a gritty sensation in the eyes.

Bronchitis: Bronchitis is an inflammation of the bronchial tubes, which carry air to and from the lungs. It can be acute or chronic. Atmospheric particulate matter, including smoke, dust, and industrial pollutants, can irritate the bronchial tubes, leading to inflammation and increased mucus production. This results in symptoms like coughing, wheezing, and difficulty breathing. Chronic exposure to particulate matter can lead to chronic bronchitis.

Chronic Obstructive Pulmonary Diseases (COPD): COPD is a group of progressive lung diseases, including emphysema and chronic bronchitis, characterized by airflow obstruction and breathing difficulties. Long-term exposure to atmospheric particulate matter, such as tobacco smoke, industrial pollutants, and vehicle emissions, is a significant risk factor for developing COPD. These particles cause chronic inflammation and damage to the lung tissue, leading to the deterioration of lung function over time.

Information booster:

Melanoma: Melanoma is a type of skin cancer that primarily results from exposure to ultraviolet (UV) radiation from the sun or tanning beds. Unlike the other conditions mentioned, melanoma is not caused by atmospheric particulate matter. Instead, it is associated with UV radiation, which damages the DNA in skin cells, leading to the development of cancerous growths.

Melanoma (B) is a type of skin cancer and is primarily associated with UV radiation, not particulate matter. Thus, the correct answer is (c) A, C, D and E only.

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**Q4.** Because of Biochemical Oxygen Demand (BOD), Dissolved Oxygen (DO) of a water body:

(a) Increases

(b) Decreases

(c) Remains unchanged

(d) Initially increases and then decreases

Answer:

B

Sol:

Biochemical Oxygen Demand (BOD) is a measure of the amount of oxygen required by microorganisms to decompose organic matter in water. When BOD levels are high, it indicates a high presence of organic matter, which increases the activity of bacteria that consume Dissolved Oxygen (DO). As these microorganisms break down organic matter, they use up DO, leading to a decrease in oxygen levels in the water.

Information Booster: · High BOD values indicate more organic pollution, which leads to increased microbial respiration and oxygen consumption, thus reducing DO levels in the water body.

Lower DO levels can harm aquatic life, as organisms rely on oxygen for survival.

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**Q5.** The Sustainable Development Goals (SDGs) are intended to be achieved by the year

(a) 2025

(b) 2027

(c) 2029
(d) 2030
Answer:
D
Sol:
The Sustainable Development Goals (SDGs) were adopted by the United Nations in September 2015 as part of the 2030 Agenda for Sustainable Development. The agenda sets out 17 goals with specific targets to be achieved by the year 2030. The goals cover a wide range of global challenges, including poverty, inequality, climate change, environmental degradation, and peace and justice. The target date of 2030 is intended to provide a 15-year timeframe for governments, organizations, and individuals to work towards these global objectives.

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**Q6.** Consider the following statements regarding biotic and abiotic components:
1. Plants and animals are biotic components.
2. Land and water are abiotic components.
3. Abiotic components depend on biotic components for survival.
4. Biotic and abiotic components together form the natural environment.
Which of the statements given above are correct?
(a) 1, 2 and 4
(b) 2 and 3
(c) 1 and 3
(d) 1, 2, 3 and 4
Answer:
A
Sol:
Correct Answer: (A) 1, 2 and 4
Explanation:
Statement 1: Plants and animals are biotic components. → Correct
→ Biotic components include all living organisms.
→ Plants, animals, and microorganisms are living entities.
→ Hence, this statement is correct.
Statement 2: Land and water are abiotic components. → Correct
→ Abiotic components include non-living elements of the environment.
→ Land, water, air, soil, and climate are abiotic in nature.
→ Therefore, this statement is correct.
Statement 3: Abiotic components depend on biotic components for survival. → Incorrect
→ Abiotic components do not depend on living organisms for survival.
→ Instead, biotic components depend on abiotic factors like air, water, and soil.
→ Hence, this statement is incorrect.
Statement 4: Biotic and abiotic components together form the natural environment. → Correct
→ The natural environment is made up of both living and non-living components.
→ Their interaction sustains ecosystems.
Information Booster:

→ Biotic components include producers, consumers, and decomposers.
→ Abiotic components regulate the functioning of ecosystems.
→ Energy flows from abiotic to biotic components through photosynthesis.
→ Balance between biotic and abiotic components is essential for life.
→ Ecosystem stability depends on their continuous interaction.

**Q7.** Stratospheric aerosol injection proposals aim to:
(a) Increase ocean carbon uptake
(b) Enhance Earth's albedo
(c) Accelerate ozone layer recovery
(d) Reduce atmospheric water vapor
5. Question not Attempted
Answer:
B
Sol:
Stratospheric aerosol injection (SAI) proposals aim to enhance Earth's albedo, which refers to the reflectivity of the Earth's surface. By injecting aerosols (such as sulfur dioxide) into the stratosphere, the idea is to create a reflective layer that can help reflect some of the Sun's radiation back into space, thus cooling the Earth and mitigating the impacts of climate change. This approach mimics the cooling effect observed after large volcanic eruptions, which inject aerosols into the stratosphere.
Information Booster:
- Stratospheric aerosol injection (SAI) is a form of geoengineering that aims to combat global warming by introducing aerosols into the stratosphere. These aerosols, typically sulfur dioxide, reflect a portion of incoming solar radiation back into space, thus cooling the Earth's surface. This process is thought to mimic the cooling effect of large volcanic eruptions, which can lead to temporary drops in global temperatures.
- The primary goal of SAI is to enhance Earth's albedo by increasing the amount of sunlight that is reflected away from the planet. This would theoretically reduce the warming effect of greenhouse gases and counteract some of the temperature increases caused by climate change.
- Albedo is a measure of how much sunlight is reflected by a surface. A higher albedo means more sunlight is reflected, leading to cooler temperatures. By injecting aerosols, SAI proposals hope to increase the Earth's albedo, especially in regions where the impact of climate change is most severe.
- While SAI could theoretically help mitigate the warming effects of climate change, it does not address the root causes of global warming, such as greenhouse gas emissions, and could have unintended consequences, such as disrupting weather patterns or further harming the ozone layer.

**Q8.** Match the following ecological terms with their correct descriptions:
List I (Term) List II (Description)
A. Commensalism 1. One benefits, other unaffected
B. Mutualism 2. Both partners benefit
C. Parasitism 3. One benefits, other harmed
D. Amensalism 4. One harmed, other unaffected
Choose the Correct Answer:
(a) A-1, B-2, C-3, D-4

(b) A-2, B-1, C-4, D-3
(c) A-3, B-2, C-1, D-4
(d) A-4, B-3, C-2, D-1
Answer:
A
Sol:
Correct Answer: (a)
Explanation:
Commensalism benefits one partner without affecting the other, mutualism benefits both, parasitism benefits one at the cost of the host, and amensalism harms one while the other remains unaffected.
Information Booster:
Lichen shows mutualism.
Cuscuta shows parasitism.
Epiphytes show commensalism.
Penicillium inhibiting bacteria shows amensalism.
These interactions shape community structure.
Additional Knowledge:
Other options mismatch the ecological interactions.

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**Q9.** According to National Education Policy (NEP) 2020, assessment of learners include :
(a) Cognitive, affective and psychomotor domains
(b) Cognitive, social and spiritual domains
(c) Physical and psychological domains
(d) Cognitive and physical domains
Answer:
A
Sol:
Solution:
The National Education Policy (NEP) 2020 emphasizes a holistic, multidimensional approach to assessing learners. It incorporates cognitive, affective, and psychomotor domains, aligning with the aim of developing critical thinking, emotional intelligence, and practical skills in students. These domains ensure that the assessment framework moves beyond rote learning to evaluate conceptual understanding, creativity, and application skills.
Explanation of the domains:

- Cognitive domain: Relates to intellectual capabilities such as knowledge, comprehension, and critical thinking.
- Affective domain: Involves emotions, attitudes, and values, fostering emotional intelligence and empathy.
- Psychomotor domain: Concerns physical skills, coordination, and performance tasks, ensuring practical learning.

Options (b), (c), and (d) are incorrect because:

- (b) neglects the affective domain, which is critical for emotional development.
- (c) focuses solely on emotional aspects, missing intellectual and physical dimensions.

- (d) contradicts NEP 2020's emphasis on conceptual and holistic learning.

Information Booster:

(a) NEP 2020 promotes continuous and comprehensive evaluation (CCE).

(b) It advocates for formative assessments alongside summative ones.

(c) Assessments include project-based, inquiry-driven, and experiential learning tasks.

(d) Rote-based assessments are discouraged in favor of skill-based evaluations.

5. The policy emphasizes competency-based education.
6. Use of technology is encouraged for effective assessments.

Additional Information:

- (a) Cognitive, affective, and psychomotor: This is the ideal holistic framework for student development.
- (b) Cognitive and psychomotor: Important but incomplete without emotional intelligence.
- (c) Affective domain only: Ignores intellectual and practical growth.
- (d) Rote learning: Outdated and contrary to NEP 2020 goals of critical and creative thinking.

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**Q10.** The Viksit Bharat vision includes which of the following objectives for Indian Railways?

(a) Enhancing railway operations

(b) Boosting economic prosperity

(c) Increasing investment opportunities

(d) All of the above

Answer:

D

Sol:

Ans. (d) All of the above

Sol. The Viksit Bharat vision, as highlighted by Prime Minister Narendra Modi, includes transforming Indian Railways to support economic growth, modernization, and improved passenger services. Key objectives under this vision include:

1. Enhancing Railway Operations:

Modernization of railway infrastructure, including track upgrades and station redevelopment.

Expansion of semi-high-speed and high-speed rail services like Vande Bharat Express and Bullet Train projects.

Implementation of AI-driven traffic management systems for efficient operations.

2. Boosting Economic Prosperity:

Strengthening rail connectivity to industrial and logistics hubs to facilitate trade and economic development.

Development of Dedicated Freight Corridors (DFCs) to enhance goods transport efficiency.

Improving connectivity to ports, business zones, and export hubs.

3. Increasing Investment Opportunities:

Promoting public-private partnerships (PPP) in railway infrastructure development.

Encouraging foreign and domestic investment in high-speed rail, metro systems, and station modernization.

Expansion of Make in India initiatives in railway manufacturing, including locomotives, coaches, and signaling systems.

**Q11.** What is the binary equivalent of the decimal number 85.125?
(a) (1001001.111)
(b) (1010101.101)
(c) (1100101.001)
(d) (1010101.001)
Answer:
D
Sol:

we can convert 85.125 to binary as follows:
Integer part:
85 ÷ 2 = 42 remainder 1
42 ÷ 2 = 21 remainder 0
21 ÷ 2 = 10 remainder 1
10 ÷ 2 = 5 remainder 0
5 ÷ 2 = 2 remainder 1
2 ÷ 2 = 1 remainder 0
1 ÷ 2 = 0 remainder 1
Therefore, the binary representation of the integer part is 1010101.
Fractional part:
0.125 × 2 = 0.250
0.250 × 2 = 0.500
0.500 × 2 = 1.000
Therefore, the binary representation of the fractional part is 0.001.
Combining the binary representations of the integer and fractional parts, we get 1010101.001 as the binary equivalent of 85.125.

**Q12.** If 20% of the males from department R move to department S, find the total number of males in department S now.The table below shows the number of people (in thousands) in five different departments, the percentage of males, and the ratio of certified to non-certified people. Use this table to answer the questions.

| Department | Total people (in thousands) | Percentage of Males | Certified : Non-certified |
|---|---|---|---|
| P | 42 | 58% | 5 : 4 |
| Q | 28 | 46% | 7 : 3 |
| R | 36 | 62% | 3 : 2 |
| S | 50 | 40% | 11 : 9 |
| T | 60 | 75% | 4 : 5 |

(a) 24,200
(b) 24,464
(c) 24,600
(d) 24,800
Answer:
B
Sol:

Solution:
Males in R = 62% of 36,000 = 22,320
20% move to S = 4,464
Males in S initially = 40% of 50,000 = 20,000
New males in S = 20,000 + 4,464 = 24,464
Answer: (b)

**Q13.** Total certified people from department Q are what percent of total non-certified people from department P?The table below shows the number of people (in thousands) in five different departments, the percentage of males, and the ratio of certified to non-certified people. Use this table to answer the questions.

| Department | Total people (in thousands) | Percentage of Males | Certified : Non-certified |
|---|---|---|---|
| P | 42 | 58% | 5 : 4 |
| Q | 28 | 46% | 7 : 3 |
| R | 36 | 62% | 3 : 2 |
| S | 50 | 40% | 11 : 9 |
| T | 60 | 75% | 4 : 5 |

(a) 100%
(b) 102.5%
(c) 105%
(d) 110%
Answer:
C
Sol:
Solution:
Certified in Q = (7/10) × 28,000 = 19,600
Non-certified in P = (4/9) × 42,000 = 18,666.67
Required percent = (19,600 / 18,666.67) × 100 = 105%
Answer: (c)

**Q14.** If 30% of males in department T are non-certified, find the ratio of non-certified males to non-certified females in T.The table below shows the number of people (in thousands) in five different departments, the percentage of males, and the ratio of certified to non-certified people. Use this table to answer the questions.

| Department | Total people (in thousands) | Percentage of Males | Certified : Non-certified |
|---|---|---|---|
| P | 42 | 58% | 5 : 4 |
| Q | 28 | 46% | 7 : 3 |
| R | 36 | 62% | 3 : 2 |
| S | 50 | 40% | 11 : 9 |
| T | 60 | 75% | 4 : 5 |

(a) 27 : 40
(b) 81 : 119

(c) 5 : 9
(d) 119 : 81
Answer:
B
Sol:
Solution:
In T: males = 75% of 60,000 = 45,000; females = 15,000
Overall non-certified in T = (5/9) × 60,000 = 33,333.33
Non-certified males = 30% of 45,000 = 13,500
Non-certified females = 33,333.33 − 13,500 = 19,833.33
Ratio = 13,500 : 19,833.33 = 81 : 119
Answer: (b)

**Q15.** Find the ratio of total females from departments P and S together to the total non-certified males from departments Q and R together (assume the certified/non-certified split is uniform across genders).The table below shows the number of people (in thousands) in five different departments, the percentage of males, and the ratio of certified to non-certified people. Use this table to answer the questions.

| Department | Total people (in thousands) | Percentage of Males | Certified : Non-certified |
|---|---|---|---|
| P | 42 | 58% | 5 : 4 |
| Q | 28 | 46% | 7 : 3 |
| R | 36 | 62% | 3 : 2 |
| S | 50 | 40% | 11 : 9 |
| T | 60 | 75% | 4 : 5 |

(a) 1985 : 533
(b) 861 : 289
(c) 215 : 72
(d) 2000 : 540
Answer:
A
Sol:
Solution:
Females in P = 42,000 × (1 − 0.58) = 17,640
Females in S = 50,000 × (1 − 0.40) = 30,000
Total females (P+S) = 47,640
Non-certified fraction: Q = 3/10, R = 2/5
Males in Q = 46% of 28,000 = 12,880 → non-certified males = 0.3 × 12,880 = 3,864
Males in R = 62% of 36,000 = 22,320 → non-certified males = 0.4 × 22,320 = 8,928
Total non-certified males (Q+R) = 12,792
Required ratio = 47,640 : 12,792 = 1985 : 533
Answer: (a)

**Q16.** In department P, if the number of certified males equals certified females, find the number of non-certified females in P.The table below shows the number of people (in thousands) in five different departments, the percentage of males, and the ratio of certified to non-certified people. Use this table to answer the questions.

| Department | Total people (in thousands) | Percentage of Males | Certified : Non-certified |
|---|---|---|---|
| P | 42 | 58% | 5 : 4 |
| Q | 28 | 46% | 7 : 3 |
| R | 36 | 62% | 3 : 2 |
| S | 50 | 40% | 11 : 9 |
| T | 60 | 75% | 4 : 5 |

(a) 5,900
(b) 5,973
(c) 6,000
(d) 6,100
Answer:
B
Sol:
Solution:
Step 1: Total males and females in Department P
Total people in P = 42,000
Male % = 58%
Female % = 42%
Males = 58% of 42,000 = 24,360
Females = 42% of 42,000 = 17,640
Step 2: Find number of certified and non-certified people
Certified : Non-certified = 5 : 4
Total ratio = 9 parts
So each part = 42,000 ÷ 9 = 4,666.67
Certified people = 5 × 4,666.67 = 23,333.33
Non-certified people = 4 × 4,666.67 = 18,666.67
Step 3: Apply given condition
Given:
Certified males = Certified females
So certified people are split equally:
Certified males = Certified females
= 23,333.33 ÷ 2
= 11,666.67 each
Step 4: Find non-certified females
Total females = 17,640
Certified females = 11,666.67
Non-certified females =
17,640 – 11,666.67

= 5,973.33 ≈ 5,973
Final Answer: 5,973 non-certified females

**Q17.** Match the following government initiatives with the primary level of education they target:

| List-I (Initiative) | List-II (Primary Target) |
|---|---|
| A- SWAYAM | 1- School Education |
| B- NEAT | 2- Faculty Training & Development |
| C- DIKSHA | 3- Higher Education (MOOCs) |
| D- NISHTHA | 4- Higher Education (Ed-Tech Integration) |

Codes:
(a) 3 4 1 2
(b) 1 2 3 4
(c) 3 4 2 1
(d) 1 2 4 3
Answer:
A
Sol:
Correct Option – (a)
Introduction: This question assesses the knowledge of key digital learning initiatives and their specific target audiences within the Indian education system.
Information Booster:
(A) SWAYAM (3): Study Webs of Active–Learning for Young Aspiring Minds is a government MOOC (Massive Open Online Course) platform designed to offer courses from grade 9 to post-graduation, but its core content and institutional partnerships are most robust in the Higher Education sector.
(B) NEAT (4): The National Educational Alliance for Technology is an initiative under the Ministry of Education to use technology for better learning outcomes in Higher Education. It aims to create a ecosystem for the adoption of adaptive learning technologies by HEIs.
(C) DIKSHA (1): The Digital Infrastructure for Knowledge Sharing platform is the national portal for School Education. It provides e-content for schools, QR-coded textbooks, and teacher training resources.
(D) NISHTHA (2): National Initiative for School Heads' and Teachers' Holistic Advancement is an integrated programme for teacher training aimed at improving the quality of school education by building the capacities of school heads and teachers.
Additional Knowledge: SWAYAM courses allow for credit transfer upon passing the proctored final exam, making it a formal part of the higher education learning programme ecosystem.

**Q18.** Find out the correct chronological order of the following:
(A) First binary computer by Britishers
(B) Printing press
(C) Plan for mechanical computer
(D) Single-screen motion picture exhibition
(E) First public broadcast of television
Choose the correct answer from the options given below:

(a) (A), (C), (E), (D), (B)
(b) (B), (C), (D), (E), (A)
(c) (C), (E), (A), (B), (D)
(d) (D), (A), (B), (C), (E)
Answer:
B
Sol:
Chronology of Events
(B) Printing Press:
Invented by Johannes Gutenberg in the 15th century (c. 1440).
Marked the beginning of mass production of books and revolutionized information dissemination.
(C) Plan for Mechanical Computer:
Proposed by Charles Babbage in the early 19th century (1837).
Known as the Analytical Engine, this was the first conceptual design of a programmable computer.
(D) Single-Screen Motion Picture Exhibition: The first public screening of motion pictures occurred on December 28, 1895, in Paris by the Lumière Brothers.
(E) First Public Broadcast of Television: The first public demonstration of television broadcasting was conducted by John Logie Baird in 1926 in the United Kingdom.
(A) First Binary Computer by Britishers: The first binary computer, Colossus, was developed by British engineers during World War II (1943–1944) for codebreaking at Bletchley Park.
Correct Order:
(B) Printing Press (c. 1440)
(C) Plan for Mechanical Computer (1837)
(D) Single-Screen Motion Picture Exhibition (1895)
(E) First Public Broadcast of Television (1926)
(A) First Binary Computer by Britishers (1943–1944)
Information Booster
1. Printing Press (1440): Revolutionized knowledge sharing and marked the beginning of the Renaissance and the Scientific Revolution.
2. Plan for Mechanical Computer (1837):
o Charles Babbage is known as the "Father of the Computer."
o His Analytical Engine was a precursor to modern computers.
3. Motion Picture Exhibition (1895): The Lumière Brothers' films laid the foundation for the modern film industry.
4. Television Broadcasting (1926): John Logie Baird's invention marked the start of televised media.
5. Binary Computer (1943 – 1944): Colossus, the world's first programmable electronic computer, was pivotal in cracking the German Enigma code during World War II.
Additional Knowledge
Gutenberg's Printing Press: Sparked a cultural revolution by enabling widespread book production.
Analytical Engine: Though never built during Babbage's lifetime, it introduced concepts such as conditional branching and loops.
Colossus: Pioneered the use of electronics in computing, influencing the development of modern digital computers.

**Q19.** Identify the correct ascending order of the following numbers under A-D represented in different bases:

(A) $(11101011)_2$ (Base-2 binary number)

(B) $(564)_8$ (Base-8 Octal number)

(C) $(614)_{10}$ (Base 10 decimal number)

(D) $(489)_{16}$ (Base 16 hexadecimal number)

Choose the correct answer from the options given below:

(a) A, C, D, B

(b) D, C, B, A

(c) B, C, A, D

(d) A, B, C, D

Answer:

D

Sol:

Step 1: Convert all numbers to Base-10 (Decimal)

Convert A

$= (11101011)_2$:

1. Expand the binary number using powers of 2:

$(11101011)_2 = (1\times2^7)+(1\times2^6)+(1\times2^5)+(0\times2^4)+(1\times2^3)+(0\times2^2)+(1\times2^1)+(1\times2^0)$

2. Perform the calculations: = 128 + 64 + 32 + 0 + 8 + 0 + 2 + 1 = 235

3. The decimal value of A is 235.

Convert B

$= (564)_8$:

1. Expand the octal number using powers of 8:

$(564)_8 = (5 \times 8^2) + (6 \times 8^1) + (4 \times 8^0)$

2. Perform the calculations:

$= (5 \times 64) + (6 \times 8) + (4 \times 1) = 320 + 48 + 4 = 372$

3. The decimal value of B is 372.

Convert C

$= (614)_{10}$:

C is already in Base-10, so no conversion is needed.

The decimal value of C is 614.

Convert D

$= (489)_{16}$:

1. Expand the hexadecimal number using powers of 16:

$(489)_{16} = (4 \times 16^2) + (8 \times 16^1) + (9 \times 16^0)$

2. Perform the calculations:

$= (4 \times 256) + (8 \times 16) + (9 \times 1) = 1024 + 128 + 9 = 1161$

3. The decimal value of D is 1161.

Step 2: Arrange the Decimal Values in Ascending Order
The converted decimal values are:
A = 235
B = 372
C = 614
D = 1161
Arrange these in ascending order:
235 (A), 372 (B), 614 (C), 1161 (D)

**Q20.** The marked price of an immersion rod in an electronic store is ₹900. The store offers a discount of 12% on its sale. At what price (in ₹) can a customer buy it from the electronic store?
(a) 782
(b) 797
(c) 787
(d) 792
Answer:
D

The marked price of an immersion rod in an electronic store is ₹900.

The store offers a discount of 12% on its sale.

**Formula used:**

Selling Price (SP) = Marked Price (MP) - Discount

$$\text{Discount} = \text{MP} \times \left(\frac{\text{Discount}\%}{100}\right)$$

**Solution:**

MP = ₹900

Discount% = 12%

Discount = 900 × (12 / 100)

=> Discount = 900 × 0.12

=> Discount = ₹108

SP = 900 - 108

=> SP = ₹792

**∴ The correct answer is option (D).**

**Q21.** Match List – I with List – II:

| | List – I (IP) | | List – II (Functions) |
|---|---|---|---|
| A. | HTTP | I. | Transmits email between servers. |
| B. | SMTP | II. | Secure version of HTTP. |
| C. | FTP | III. | Transfers files between computers. |
| D. | HTTPS | IV. | Protocol for browsing websites. |

Choose the correct match:
(a) A - IV, B - I, C - III, D - II
(b) A - I, B - IV, C - III, D - II
(c) A - II, B - I, C - IV, D - III
(d) A - III, B - II, C - I, D - IV
Answer:
A
Sol:
A. HTTP → HTTP (HyperText Transfer Protocol) is used for browsing websites and retrieving web pages. It is a standard protocol used to transfer data over the web. So, A → IV.
B. SMTP → SMTP (Simple Mail Transfer Protocol) is used to transmit email between servers, handling the sending of emails. So, B → I.
C. FTP → FTP (File Transfer Protocol) is used to transfer files between computers, allowing file access, transfer and management over the internet. So, C → III.
D. HTTPS → HTTPS (HyperText Transfer Protocol Secure) is the secure version of HTTP, ensuring encrypted communication between the server and the client. So, D → II.

---

**Q22.** The term "Cybernetics" was coined by:
(a) Jay Forrester
(b) Stafford Beer
(c) Norbert Wiener
(d) W. Ross Ashby
Answer:
C
Sol:
The term "Cybernetics" was coined by Norbert Wiener, an American mathematician and philosopher, in 1948. He defined cybernetics as the study of control and communication in the animal and the machine. Wiener's work laid the foundation for understanding complex systems, feedback mechanisms, and control theory, influencing fields like engineering, biology, computer science, and political science.
Cybernetics studies how systems regulate themselves through feedback to maintain stability and achieve goals, making it a crucial concept in systems theory and organizational studies.
Information Booster:
(a) Norbert Wiener published his seminal book, "Cybernetics: Or Control and Communication in the Animal and the Machine" in 1948.
(b) Cybernetics focuses on feedback loops, control mechanisms, and information flow within systems.

(c) The discipline bridges biology, engineering, and social sciences by analyzing communication and control in both machines and living beings.
(d) Cybernetics influenced the development of systems theory and modern computing.
5. Wiener's concept is foundational to understanding self-regulating systems in politics, economics, and management.
6. Feedback, a key cybernetic principle, explains how systems adjust behavior based on output.
7. The term comes from the Greek word 'kybernetes', meaning 'steersman' or 'governor'.
Additional Information:

- (a) Jay Forrester: Pioneer of system dynamics, but did not coin the term cybernetics.
- (b) Stafford Beer: Known for applying cybernetics to management and organizational theory (management cybernetics).
- (c) Norbert Wiener: Correct answer; originator of the term and founder of the field.
- (d) W. Ross Ashby: Important contributor to cybernetics and systems theory, known for the Law of Requisite Variety.

---

**Q23.** The original breadth of a rectangular box is 25 cm. The box was then remade in such a way that its length was increased by30% but the breadth decreased by 20% and the area increased by 100
cm2
cm
2
. What is the length (in cm) of the new box?
(a) 100
(b) 130
(c) 91
(d) 109
Answer:B

**Sol: Given:**

Original breadth ( b ) = 25 cm

Length is increased by 30%

Breadth is decreased by 20%

Area increases by 100 $cm^2$

Find the new length $L_{new}$ of the box.

**Concept Used:**

Area of a rectangle = Length × Breadth

Percentage changes in dimensions affect the area.

**Solution:**

Original length = ( L )

Original area $(A_{\text{original}}) = (L \times 25)$

New dimensions

New length $(L_{\text{new}}) = (1.3L)$

New breadth $(b_{\text{new}}) = (0.8 \times 25 = 20)$ cm

New area $(A_{\text{new}}) = (1.3L \times 20 = 26L)$

Change in area

$A_{\text{new}} - A_{\text{original}} = 100\ \text{cm}^2$

26L - 25L = 100

L = 100 cm

New length ( $L_{\text{new}}$ )

$L_{\text{new}} = 1.3 \times L = 1.3 \times 100 = 130$ cm

**Q24.** Which of the following are web search engines?
A. DuckDuckGo
B. Google
C. Yahoo search
D. Bing
E. Pinterest
Choose the correct answer from the options given below:

(a) B, C and D only
(b) A, B, C and D only
(c) B and E only
(d) A, C, D and E only
Answer:
B
Sol:
The correct answer is A, B, C and D only.
DuckDuckGo, Google, Yahoo Search, and Bing are all web search engines that allow users to search the internet for websites, images, videos, and other online content.
Pinterest is not a search engine, but a social media platform where users can share images and organize them into boards.
Information Booster
1. Google: Google is the most widely used search engine worldwide, known for its accuracy and wide range of search features.
2. Bing: Bing is Microsoft's search engine and offers similar functionalities to Google, including web search, image search, and news updates.
3. DuckDuckGo: DuckDuckGo is a privacy-focused search engine that doesn't track user data or search history.
4. Yahoo Search: Yahoo Search is an older search engine that is still in use today, although it now uses Bing for search results.
Additional Knowledge
Pinterest: Incorrect. Pinterest is a visual discovery engine, but not a search engine.

---

**Q25.** Choose the 'WRONG' statement.
A. 'JPEG' stands for Joint Photographic Exchange General
B. 'FTP' stands for File Transfer Protocol
C. 'GUI' stands for General User Interface
D. 'FAT' stands for File Allocation TableChoose the correct answer from the options given below:
(a) A and B Only
(b) A and C Only
(c) B and C Only
(d) C and D Only
Answer:
B
Sol:
Introduction:
This question tests knowledge of common acronyms in computing and information technology. Identifying the incorrect expansions is crucial for understanding basic tech terminology, which is often relevant in the ICT section of UGC NET Paper 1.
Information Booster:
Let's evaluate each statement:

- A. 'JPEG' stands for Joint Photographic Exchange General

WRONG. The correct expansion is Joint Photographic Experts Group. JPEG is a standard method for compressing digital images.

- B. 'FTP' stands for File Transfer Protocol

CORRECT. FTP is a standard network protocol for transferring files between a client and a server.

- C. 'GUI' stands for General User Interface

WRONG. The correct expansion is Graphical User Interface. GUI allows users to interact with electronic devices through graphical icons.

- D. 'FAT' stands for File Allocation Table

CORRECT. FAT is a file system developed for MS-DOS and Windows, managing files on storage devices.

Additional Knowledge:

(a) JPEG:

- Developed by the Joint Photographic Experts Group.
- Widely used for lossy compression of digital images (e.g., .jpg files).

(b) FTP:

- Used for uploading files to web servers, downloading software, etc.
- Secure variants include SFTP (SSH File Transfer Protocol) and FTPS (FTP Secure).

(c) GUI:

- Pioneered by Xerox PARC and popularized by Apple Macintosh and Microsoft Windows.
- Contrasts with CLI (Command-Line Interface).

(d) FAT:

- Common variants: FAT12, FAT16, FAT32.
- Still used in removable media (e.g., USB drives, SD cards).

---

**Q**26 In a certain code language, ABOUT is written as YYRDB and ACUTE is written as JXXEB. How will ANGLE be written as in that language?

(a) BPJPJ

(b) JPJBP

(c) JPJPB

(d) JPJPC

Answer:

C

Sol:

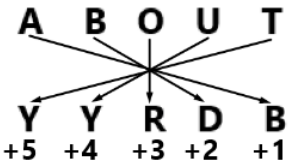
Given:

In a certain code language, ABOUT is written as YYRDB and ACUTE is written as JXXEB.

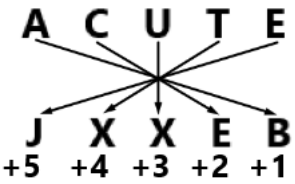
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | D | E | F | G | H | I | J | K | L | M |
| Z | Y | X | W | V | U | T | S | R | Q | P | O | N |
| 26 | 25 | 24 | 23 | 22 | 21 | 20 | 19 | 18 | 17 | 16 | 15 | 14 |

Logic: The following pattern is followed.

For, ABOUT → YYRDB

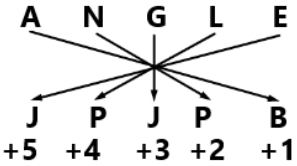



For, ACUTE → JXXEB




Similarly,

ANGLE → ?




So, ANGLE be written as JPJPB.

Thus, correct option is (c).

---

**Q27.** Which of the following numbers will replace the question mark ( ?) in the given series ?

71, 77, 86, 98, 113, 131, ?

(a) 149

(b) 148

(c) 166

(d) 152

Answer: D

Sol:

Given: 71, 77, 86, 98, 113, 131, ?

Logic: Differences increase by 3 each time from 6.

71 + 6 = 77

77 + 9 = 86

86 + 12 = 98

98 + 15 = 113

113 + 18 = 131

131 + 21 = 152

So, the missing term is 152.

Thus, correct option is (d).

---

**Q28.** The marked price of a table is Rs. 8,980. If the shopkeeper offers a discount of 19%, what is its selling price (in Rs. , to the nearest rupee)?

(a) Rs. 7,427

(b) Rs. 7,472

(c) Rs. 7,247

(d) Rs. 7,274

Answer:D

**Sol: Given:**

Marked price (MP) = ₹8,980

Discount = 19%

**Formula Used:**

Selling Price (SP) = MP - Discount

**Solution**

Calculate the discount amount:

Discount = $8980 \times \frac{19}{100} = 1706.2$

Selling Price:

SP =8980-1706.2= 7273.8 ≈ 7274

---

**Q29.** In April 2025, which Indian institute ranked highest among Indian entries in the Times Higher Education (THE) Asia University Rankings 2025?

(a) Indian Institute of Technology Delhi

(b) Indian Institute of Science (IISc), Bengaluru

(c) Indian Institute of Technology Bombay

(d) Jawaharlal Nehru University

5. University of Delhi

Answer:

B

Sol:

The Indian Institute of Science (IISc), Bengaluru topped the list among Indian institutions in the THE Asia University Rankings 2025, securing the 38th rank overall with a score of 65.2.

The United Kingdom(UK) based Times Higher Education (THE) released its 13th Asia University Rankings.

China topped the list, retaining 1st (Tsinghua University, score 92.5) and 2nd (Peking University, score 92) spots.

lt is followed by the National University of Singapore (NUS) (Singapore) and Nanyang Technological University (Singapore)ranked in 3rd and 4th positions respectively.

---

**Q30.** Which of the following are admitted by the Naiyayikas (Indian Logicians) as kinds of Inferences?

(A) Inference of the effect from the cause

(B) Inference of the cause from the effect

(C) Inference from knowledge of similarity between two kinds of objects

(D) Inference from observation for general inseparability

Choose the correct answer from the options given below:

(a) (A), (B) and (C) only

(b) (A), (B) and (D) only

(c) (A) and (B) only

(d) (A) and (D) only

Answer:
B
Sol:
The Naiyāyikas (Indian Logicians) in the Nyāya school of philosophy recognize the following kinds of inferences:
(A) Inference of the effect from the cause: This is based on understanding the relationship where a cause leads to an effect. For example, the presence of clouds is inferred to result in rain.
(B) Inference of the cause from the effect: This involves inferring a cause from its observed effect. For example, seeing water on the ground and inferring it has rained.
(D) Inference from observation for general inseparability: Known as *vyāpti* in Nyāya logic, this inference relies on the observed invariable concomitance or inseparability between two entities. For example, wherever there is smoke, there is fire.
Information Booster 1. Naiyāyikas classify inference ( *anumāna*) into three types:
Pūrvavat (From cause to effect): Inferring rain from clouds.
Śeṣavat (From effect to cause): Inferring fire from smoke.
Sāmānyato dṛṣṭa (General inseparability): Based on repeated observation of a relation, like fire and smoke.
2. Their logical framework relies on *vyāpti*, the universal relation between the inferential sign ( *hetu*) and the object inferred.
3. Naiyāyikas do not prioritize analogical reasoning (similarity) in their inferences.
4. Observation ( *pratyakṣa*) and testimony ( *śabda*) are other key pramāṇas (means of knowledge) in Nyāya philosophy.
Additional Knowledge:
(C) is incorrect because the Naiyāyikas do not base inferences on mere similarity between objects. They emphasize invariable relations (cause-effect, general inseparability) rather than analogical reasoning.

---

**Q31.** Which of the following statements is logically equivalent to the statement - "No liquids are beverages."?
(a) All non-bevarages are non-liquids
(b) All liquids are beverages.
(c) Some beverages are not liquids
(d) No beverages are liquids.
Answer:
D
Sol:
The given statement, "No liquids are beverages," implies that there is no overlap between the categories of liquids and beverages. In formal logic, this means the two sets are mutually exclusive. The logically equivalent statement must convey the same idea of mutual exclusivity.
No beverages are liquids:
Correct. This directly states that the set of beverages and the set of liquids have no overlap, which is logically equivalent to "No liquids are beverages."
Information Booster: · Logical equivalence: Two statements are logically equivalent if they have the same truth value in all possible scenarios.

Statements involving "no" often imply mutual exclusivity of two sets.
Using Venn Diagrams can help visually confirm logical equivalence in such problems.
The original statement and its equivalent, "No beverages are liquids," both assert mutual exclusion without implying anything about non-beverages or non-liquids.

**Q32.** What can be correctly claimed in the light of AEE in the 1st figure?
A. The middle term is distributed in the major premise
B. It commits the fallacy of illicit-Minor
C. It commits the fallacy of illicit-Major
D. The middle term is distributed in the minor premise
E. The conclusion does not distribute either of the terms
Choose the correct answer from the options given below:
(a) A, C, and D only
(b) C and E only
(c) A and D only
(d) B, C, D, and E only
Answer:
A
Sol:
In the context of AEE, in the first figure of a syllogism, the following claims hold:

- A. The middle term is distributed in the major premise: In the first figure, the middle term is indeed distributed in the major premise because it connects both premises through the major term.
- C. It commits the fallacy of illicit-Major: In this figure, the major term is incorrectly assumed to be distributed in the conclusion, committing the fallacy of illicit-Major.
- D. The middle term is distributed in the minor premise: The middle term must be distributed in the minor premise to ensure a valid syllogistic structure in the first figure. This is a key characteristic.

Information Booster:
(a) The first figure of syllogism has the form:

- Major Premise: All M are P
- Minor Premise: All S are M
- Conclusion: All S are P

(b) The middle term must be distributed in at least one premise to form a valid syllogism.
(c) The fallacy of illicit-major occurs when the major term is improperly distributed in the conclusion, despite not being distributed in the major premise.
(d) AEE indicates specific conditions for valid syllogistic reasoning in logical deduction.
5. In the first figure, the middle term is crucial for establishing the connection between the premises and conclusion.

UNCONDITIONALLY VALID FORMS

| Figure 1 | Figure 2 | Figure 3 | Figure 4 |
|---|---|---|---|
| AAA | EAE | IAI | AEE |
| EAE | AEE | All | IAI |
| All | EIO | OAO | EIO |
| EIO | AOO | EIO | |

Additional Information:

- B. It commits the fallacy of illicit-Minor: This does not apply in the case of AEE in the first figure, as the minor term distribution is not problematic here.
- E. The conclusion does not distribute either of the terms: This is incorrect for AEE in the first figure, as the distribution of terms follows a valid pattern, particularly in the major and minor premises.

---

**Q33.** Which of the following tools can be used for traditional offline teaching?

(a) Projector

(b) PowerPoint

(c) Physical models

(d) LMS

Answer:

C

Sol:

Traditional offline teaching relies on tangible, hands-on tools such as physical models to aid understanding and engagement. Physical models provide a concrete way to visualize concepts, which is fundamental in traditional classroom settings. While projectors and PowerPoint can be used in offline settings, they are more associated with tech-enhanced instruction. LMS (Learning Management Systems) are typically used in online or blended learning environments.

---

**Q34.** Which of the following cannot be considered a part of India's folk communication tradition?

(a) Cinema

(b) Jatra

(c) Ramleela

(d) Kumbh Mela

Answer:

A

Sol:

Cinema cannot be considered a part of India's folk communication tradition. Cinema, although deeply rooted in Indian culture, is a modern form of mass communication that emerged with technological advancements. It uses a highly sophisticated medium that reaches a broader audience across the globe, making it different from traditional folk communication, which is typically oral, regional, and community-centered.

Information Booster: · Folk communication is often interpersonal and community-based.

It relies heavily on oral traditions, storytelling, and performance arts.

Modern mass communication mediums like cinema use advanced technology.

Folk forms serve as tools of social and cultural expression for centuries.

Additional Knowledge:

Jatra: A popular folk theatre form originating from Bengal. It is a musical drama that conveys religious and mythological stories, serving as a traditional mode of entertainment.

Ramleela: A folk play performed in many parts of India, especially during Dussehra. It enacts scenes from the epic Ramayana and is deeply rooted in religious and cultural traditions.

Kumbh Mela: One of the largest religious gatherings in the world, where millions of devotees participate in rituals and fairs. It plays a significant role in preserving India's spiritual and cultural heritage.

**Q35.** Choose the 'WRONG' statement regarding effective assessment practices:
A. Assessment should be an integral part of the teaching-learning process.
B. All assessments must involve formal written examinations.
C. Assessment results should be used to inform instructional adjustments.
D. Students should be actively involved in the assessment process, including self and peer assessment.
Choose the correct answer from the options given below:
(a) A Only
(b) B Only
(c) C Only
(d) D Only
Answer:
B
Sol:
Correct Option - (b)
Introduction: This question asks to identify the incorrect statement about widely accepted principles of effective assessment in education.
Information Booster: Let's analyze each statement:
A. Assessment should be an integral part of the teaching-learning process:
Correct Statement. This is a core principle of "assessment for learning," where assessment is seen as continuous and embedded in instruction, not just an external event.
B. All assessments must involve formal written examinations:
WRONG Statement. This is a common misconception. Effective assessment utilizes a variety of methods, including informal observations, projects, presentations, portfolios, oral questioning, and performance tasks, in addition to formal written examinations. Relying solely on written exams provides a limited view of student learning.
C. Assessment results should be used to inform instructional adjustments:
Correct Statement. A key purpose of assessment, especially formative assessment, is to provide data that teachers can use to modify their teaching strategies, re-teach concepts, or provide differentiated support.
D. Students should be actively involved in the assessment process, including self and peer assessment:
Correct Statement. Involving students in self-assessment and peer assessment promotes metacognition, self-regulation, and a deeper understanding of learning criteria.
Conclusion: The WRONG statement is B. All assessments must involve formal written examinations.
Additional Information: Modern assessment philosophies advocate for a diverse range of assessment methods to capture the full spectrum of student learning and abilities, moving beyond a narrow focus on traditional tests.

**Q36.** Match the following Levels of Teaching with their primary focus and the associated psychologist's model.

| List-I (Level of Teaching) | List-II (Primary Focus & Psychologist) |
|---|---|
| A. Memory Level | 1. Problem-solving and critical thinking (Hunt) |
| B. Understanding Level | 2. Imitation and recall (Herbart) |
| C. Reflective Level | 3. Generalization and principle formation (Morrison) |

Codes:
(a) A-2, B-3, C-1
(b) A-1, B-2, C-3
(c) A-2, B-1, C-3
(d) A-3, B-2, C-1
Answer:
A
Sol:
Correct Option – (a)
Introduction: The concept of "Levels of Teaching" categorizes the teaching-learning process based on the cognitive depth and intellectual activity it demands from the learner. Understanding these levels helps in designing appropriate instructional strategies and assessment methods.
Information Booster:
A. Memory Level (Matches with 2): This is the most basic level, focusing on rote memorization, imitation, and recall of facts and information. It is associated with Herbart's model of teaching, which emphasizes the systematic presentation of content for memorization. Thought processes are minimal, and evaluation is based on the ability to reproduce information.
B. Understanding Level (Matches with 3): This level moves beyond memorization. The emphasis is on comprehension, generalization, and principle formation. Students are helped to understand the meaning, relationships, and underlying principles of the information. It is linked to Morrison's teaching model, which is based on the "unit approach" and aims at mastery and understanding of the subject matter.
C. Reflective Level (Matches with 1): This is the highest and most complex level of teaching, synonymous with the "problem-centered" level. The focus is on developing critical and creative thinking, problem-solving, and insightful learning. Students are presented with problems, and the teaching-learning environment is structured to help them analyze, form hypotheses, and arrive at solutions. This level is associated with Hunt's model, which emphasizes the cognitive development of the learner.
Additional Knowledge:
These levels are not watertight compartments; a good teaching session often integrates all three. The Reflective Level aligns with Benjamin Bloom's higher-order cognitive skills (Analyze, Evaluate, Create) from his taxonomy.

---

**Q37.** Statement I: The Channels of SWAYAM PRABHA are uplinked from BISAG, Hyderabad.
Statement II: SWAYAM PRABHA is an education learning platform available 24×7 through 37 DTH channels.
In the light of the above statement, choose the correct answer from the options given below:
Given below are two statements:
(a) Both Statement I and Statement II are true.

(b) Both Statement I and Statement II are false.
(c) Statement I is true but Statement II is false.
(d) Statement I is false but Statement II is true
Answer:
B
Sol:
(b) Both Statement I and Statement II are false
Sol. Statement I is false because the channels of SWAYAM PRABHA are not uplinked from BISAG in Hyderabad; they are uplinked from BISAG (Bhaskaracharya Institute for Space Applications and Geoinformatics) which is located in Gandhinagar, Gujarat. Statement II is also false because SWAYAM PRABHA currently operates 40 DTH channels, not 37.
Information Booster:
BISAG: Bhaskaracharya Institute for Space Applications and Geoinformatics, involved in satellite communication and geoinformatics.
SWAYAM PRABHA: A group of 34 DTH channels providing high-quality educational content 24x7, initiated by the Ministry of Human Resource Development, India.

---

**Q38.** Which of the following are traditional approaches to communication?
A. Machine-to-machine
B. Machine-to-man
C. Rhetorical
D. Semiotic
E. Phenomenological
Choose the correct answer from the options given below:
(a) A, B and C only
(b) A, D and E only
(c) B, C and D only
(d) C, D and E only
Answer:
D
Sol:
The traditional approaches to communication are largely rooted in humanistic and philosophical frameworks that emphasize human interaction, meaning-making, and the exchange of ideas. These include:
Rhetorical: This approach focuses on the art of persuasion and effective speaking or writing. It is one of the oldest approaches, dating back to ancient Greece, where rhetoric was central to public speaking and debate.
Semiotic: This approach studies signs and symbols and their role in communication. It explores how meaning is created and interpreted through various symbols and signs, making it a fundamental traditional approach to understanding communication.
Phenomenological: This is an experiential approach where communication is understood through personal experiences and subjective understanding. It emphasizes how individuals perceive and interpret communication based on their lived experiences.

Information Booster: · The rhetorical approach remains central to public speaking, debates, and persuasion.
Semiotics is crucial in understanding language, media, and cultural communication through symbols and signs.
Phenomenology offers insight into how personal experiences shape communication and understanding.
These traditional approaches focus on the human elements of communication, such as meaning-making, perception, and persuasion.
Additional Knowledge: · (A) Machine-to-machine: Involves communication between devices without human intervention. It is a technological advancement not considered part of traditional communication theories.
(B) Machine-to-man: Refers to interactions between machines (like computers or robots) and humans. This is a more recent concept involving human-computer interaction, also not a traditional communication approach.

---

**Q39.** In qualitative research, triangulation means:
(a) Using multiple data sources or methods to increase credibility
(b) Sampling randomly
(c) Using only one data collection method
(d) Quantifying data
Answer:
A
Sol:
Triangulation in qualitative research refers to the use of multiple data sources, methods, investigators, or theories to cross-verify findings and enhance the credibility and validity of the research.
Information Booster:
Can include data triangulation, investigator triangulation, theory triangulation, and methodological triangulation.
Helps overcome bias and offers a more comprehensive understanding.
Builds trustworthiness and rigor in qualitative studies.
Allows confirmation and contradiction to be explored.
Commonly used in ethnography, case studies, and grounded theory.
Increases confidence in findings for audiences and stakeholders.
Encourages reflexivity and thorough analysis.
Additional Knowledge:
(b) Random sampling is quantitative, unrelated to triangulation.
(c) Using one method reduces depth and credibility.
(d) Quantifying data is a quantitative process, not triangulation.

---

**Q40.** With reference to digital communication, which of the following are examples of simplex type of communication?
A. Radio broadcasting
B. Television broadcasting
C. Computer to Printer communication

D. Keyboard to computer communication
E. Walkie-Talkie communication
Choose the correct answer from the options given below:
(a) E Only
(b) A, B, C and D Only
(c) A, C and E Only
(d) D and E Only
Answer:
B
Sol:
- Simplex communication is a one-way communication mode where data flows only in one direction from sender to receiver with no return channel for feedback or response.
- Radio broadcasting (A) and Television broadcasting (B) are classic examples of simplex communication since signals are transmitted from the station to the audience without any feedback from the receiver.
- Computer to Printer communication (C) is simplex because data flows only from the computer to the printer; the printer does not send data back to the computer in typical printing operations.
- Keyboard to computer communication (D) is also simplex, where the keyboard sends input signals to the computer but does not receive any data back.
- Walkie-Talkie communication (E) is not simplex; it is half-duplex, meaning communication can occur in both directions but only one direction at a time (push-to-talk).

Information Booster:
(a) Simplex communication is unidirectional and typically used in broadcasting and some peripheral device communications.
(b) Half-duplex allows communication both ways but not simultaneously (e.g., walkie-talkies).
(c) Full-duplex communication allows simultaneous two-way data flow (e.g., telephone calls).
(d) Simplex systems are simpler and often cheaper due to one-way data flow.
5. Examples of simplex include television, radio, keyboards, and printers.

**Q41.** Match the LIST-I with LIST-II

| LIST-I (n = number of Trials, p = Probability of Success) | LIST-II (Mean and Standard Deviation of Binomial Distribution) |
|---|---|
| A. n = 5, p = 0.4 | I. 2.8 and 1.296 |
| B. n = 6, p = 0.6 | II. 2.0 and 1.095 |
| C. n = 8, p = 0.5 | III. 4.0 and 1.414 |
| D. n = 7, p = 0.4 | IV. 3.6 and 1.200 |

Choose the correct answer from the options given below:
(a) A-II, B-III, C-IV, D-I
(b) A-I, B-IV, C-III, D-II
(c) A-III, B-II, C-I, D-IV
(d) A-II, B-IV, C-III, D-I
Answer:

D

**Sol: Solution:**

Mean (μ) = n × p

Standard Deviation (σ) = √(n × p × q) where q = 1 − p

Let's calculate for each case:

A. n = 5, p = 0.4 → q = 0.6
Mean = 5 × 0.4 = 2.0

Std Dev = √(5 × 0.4 × 0.6) = √1.2 ≈ 1.095 → Match with II

B. n = 6, p = 0.6 → q = 0.4
Mean = 6 × 0.6 = 3.6

Std Dev = √(6 × 0.6 × 0.4) = √1.44 ≈ 1.200 → Match with IV

C. n = 8, p = 0.5 → q = 0.5
Mean = 8 × 0.5 = 4.0

Std Dev = √(8 × 0.5 × 0.5) = √2 ≈ 1.414 → Match with III

D. n = 7, p = 0.4 → q = 0.6
Mean = 7 × 0.4 = 2.8

Std Dev = √(7 × 0.4 × 0.6) = √1.68 ≈ 1.296 → Match with I

**Final Matching:**

| LIST-I | LIST-II |
|---|---|
| A. n = 5, p = 0.4 | II. 2.0 and 1.095 |
| B. n = 6, p = 0.6 | IV. 3.6 and 1.200 |
| C. n = 8, p = 0.5 | III. 4.0 and 1.414 |
| D. n = 7, p = 0.4 | I. 2.8 and 1.296 |

**Correct Option: D**

A–II, B–IV, C–III, D–I

**Q42.** Which of the following defines a 'longitudinal research design'?
(a) Research conducted at one point in time across different groups
(b) Research comparing two or more variables without time-based tracking
(c) Research that follows the same subjects over a period of time
(d) Research that manipulates the independent variable across groups once
Answer:
C
Sol:
Longitudinal research design refers to a study in which the same group of individuals (sample) is studied over a period of time to observe changes and developments. This type of design allows for tracking trends, developmental changes, or causal relationships over time.
Information Booster:
It involves repeated observations or measurements.
Common in psychology, sociology, education, and health sciences.
Helps detect cause-effect relationships more reliably over time.
Reduces individual differences bias since the same participants are studied.
Can be panel studies, cohort studies, or trend studies.
Takes more time and resources compared to cross-sectional design.
Helps evaluate long-term effects of interventions.
Additional Knowledge:
(a) Cross-sectional design studies different groups at a single point.
(b) Correlational design studies relationships, not over time.
(d) Experimental design involves manipulation but not necessarily over time.
Longitudinal designs are crucial for developmental studies, policy impact studies, and public health tracking.

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**Q43.** In the context of Research Methodology, what does the word Ontology refer to?
(a) Concepts and categories, their properties and relationships
(b) Research papers and journals and their citation
(c) Cancers, diseases and their treatments
(d) A word indexing method
Answer:
A
Sol:
Ontology in the context of research methodology refers to the study of being, reality, or existence, focusing on what entities exist and how they can be grouped and categorized. It deals with the concepts and categories fundamental to a particular discipline, including their properties and relationships. Ontology addresses questions about what is real and how entities interact within a particular context, often forming the basis for theoretical frameworks in research. For instance, in social sciences, ontology might involve exploring the nature of social realities like institutions or relationships. Ontology is a crucial element in establishing the philosophical foundations of research, influencing how researchers perceive and interpret data.

**Q44.** Which of the following are the orders of signification in communication?
A. Denotation
B. Connotation
C. Myth
D. Credibility
E. Attribution
Choose the correct answer from the options given below:
(a) A, B and C only
(b) B, C and D only
(c) C, D and E only
(d) A, D and E only
Answer:
A
Sol:
The correct answer is:
(a) A, B, and C only
In the study of semiotics within communication, the orders of signification refer to the levels at which signs (like words, images, sounds) convey meaning. These include:
A. Denotation: This is the first order of signification and refers to the literal, dictionary definition of a sign. It's the most direct and explicit meaning of a sign.
B. Connotation: This is the second order of signification and involves the cultural, emotional, or associative meanings that are linked to a sign beyond its literal definition. Connotations are subjective and vary across different cultures and social groups.
C. Myth: This refers to the broader, often ideological messages that a sign can convey. In semiotic terms, myth is a cultural story or concept that goes beyond even connotations to embed deeper social meanings into the sign.
D. Credibility and E. Attribution do not fall under the typical categories of signification in semiotics. Credibility relates more to the reliability or believability of a source or message, and attribution deals with the source or origin of a message, neither of which are levels of meaning in signs themselves.

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**Q45.** Which of the following are considered "Institutes of National Importance" in India?
A. Indian Institutes of Technology (IITs)
B. National Institutes of Technology (NITs)
C. Indian Institutes of Management (IIMs)
D. Indian Institutes of Science Education and Research (IISERs)
E. Indian Council of Agricultural Research Institutes (ICAR)
Choose the correct answer from the options given below:
(a) A, B and D only
(b) A, B, C and D only
(c) B, C, D and E only
(d) A, B, C, D and E
Answer:
B

Sol:
In India, an Institute of National Importance (INI) is an institution established or designated by an Act of Parliament as one that plays a major role in developing highly skilled personnel or promoting research in a specific sector. They receive special funding and recognition from the Government of India.
Information Booster:
The following institutions are designated as Institutes of National Importance by specific Acts of Parliament:
Indian Institutes of Technology (IITs) (A):
The IITs are designated as INIs under the Institutes of Technology Act, 1961.
They are the premier technical and research universities in India, focusing on engineering, technology, science, and research.
National Institutes of Technology (NITs) (B):
The NITs are designated as INIs under the National Institutes of Technology Act, 2007 (later amended as the National Institutes of Technology, Science Education and Research Act, 2007).
They are a group of public technical universities and are considered second only to the IITs in technical education and are key for regional technical development.
Indian Institutes of Management (IIMs) (C):
The IIMs were given the status of INIs under the Indian Institutes of Management Act, 2017.
This Act granted them greater autonomy and the authority to award degrees instead of just diplomas. They are the premier business schools in the country.
Indian Institutes of Science Education and Research (IISERs) (D):
The IISERs are designated as INIs under the National Institutes of Technology, Science Education and Research Act, 2007 (NITSER Act).
They are autonomous institutions focused on integrated five-year BS-MS dual degree programs and dedicated to high-quality scientific research and education.
Additional Knowledge:
The following institution is not designated as an Institute of National Importance:
Indian Council of Agricultural Research Institutes (ICAR) (E):
ICAR is an apex body for coordinating, guiding, and managing research and education in agriculture in the entire country.
It is a registered society under the Societies Registration Act, 1860, and functions under the Department of Agricultural Research and Education (DARE), Ministry of Agriculture and Farmers Welfare. While immensely important, its constituent institutes are not designated as INIs under an Act of Parliament specifically for that purpose. The status is reserved for institutions like the IITs, NITs, IIMs, AIIMS, NIPER, etc.