BSHS

IEEJA

Number Theory (Quantitative Aptitude)

SET **B**

Questions: **36**
Duration: **120min**

Question Text Array Format

This section demonstrates how the question_text array creates line breaks, with each string value becoming a separate line when rendered.

1. *What is the chemical symbol for water?*

   A. O_2 **B.** CO_2
   C. H_2O **D.** NaCl

2. *This question has one string in the question_text array, creating a single line. How many strings are in this question_text array?*

   A. 4 strings   **B.** 2 strings
   C. 1 string   **D.** 3 strings

3. *This question demonstrates three-line formatting.*
   The question_text array has three string values.
   How many separate lines will be displayed when this question is rendered?

   A. 1 line   **B.** 4 lines
   C. 3 lines   **D.** 2 lines

4. *During photosynthesis, plants absorb carbon dioxide from the atmosphere.*
   They use sunlight energy to convert it into glucose.
   What gas is released as a byproduct of this process?

   A. Carbon monoxide   **B.** Nitrogen
   C. Hydrogen   **D.** Oxygen

5. *A light ray travels from air into glass.*
   What phenomenon occurs at the boundary?

   A. Neither reflection nor refraction
   B. Refraction only   **C.** Reflection only
   D. Both reflection and refraction

6. *This question demonstrates two-line formatting with separate strings.*
   How many strings are in this question_text array?

   A. 3 strings   **B.** 2 strings
   C. 1 string   **D.** 4 strings

LIST Placeholder Format

This section demonstrates how the LIST placeholder in question_text works with list_items to display formatted lists.

7. *Which of the following are states of matter?*

   i. Solid
   ii. Liquid
   iii. Gas
   iv. Plasma

   A. i, ii, and iii only   **B.** i and ii only
   C. i and iii only   **D.** All of the above

8. a. World War II ends
   b. Moon landing
   c. Fall of Berlin Wall
   d. Internet becomes public

   Order the above events in chronological order.

   A. $b \rightarrow a \rightarrow d \rightarrow c$ **B.** $a \rightarrow b \rightarrow c \rightarrow d$
   C. $d \rightarrow b \rightarrow a \rightarrow c$ **D.** $a \rightarrow c \rightarrow b \rightarrow d$

9. *Consider the following steps to solve a linear equation:*

   A. Subtract 5 from both sides
   B. Divide both sides by 2
   C. Check the solution

   What is the correct order to solve 2x + 5 = 15?

   A. $A \rightarrow B \rightarrow C$ **B.** $C \rightarrow A \rightarrow B$
   C. $B \rightarrow A \rightarrow C$ **D.** $A \rightarrow C \rightarrow B$

10. *This question shows intro-text, LIST, question-text structure with three parts.*

    Part 1: Introduction text
    Part 2: List items displayed here
    Part 3: Question text after the list

    What pattern does this question demonstrate?

    A. intro-LIST-question structure
    B. intro-question-LIST structure
    C. LIST-intro-question structure
    D. question-LIST-intro structure

11. *This question uses LIST placeholder to display items from list_items array.*

    Item 1: First list item
    Item 2: Second list item

    How many items are in the list below?

    A. 3 items   **B.** 1 item
    C. 2 items   **D.** 4 items

STATEMENT/STATEMENTS Placeholder Format

This section demonstrates STATEMENT placeholder (rare case for single statement) and STATEMENTS placeholder (common case for multiple statements) usage with statements array.

12. **Statement:**

Objects with greater mass exert stronger gravitational force on other objects.

Evaluate the scientific accuracy of the statement above.

Is this statement about gravitational force correct?

- **A.** Cannot be determined from given information
- **B.** True - the statement is scientifically accurate
- **C.** Partially true - only applies to planets
- **D.** False - mass does not affect gravitational force

13. *This question uses STATEMENTS placeholder (not STATEMENT) with multiple statements.*

Statement I:

This is the first roman numeral statement in the array.

Statement II:

This is the second roman numeral statement in the array.

How many roman numeral statements are shown above?

- **A.** No statements
- **B.** 3 statements
- **C.** 1 statement
- **D.** 2 statements

14. *In biological systems, photosynthesis is a crucial process.*

Consider the relationship between light and this process:

Assertion (A):

Light energy is essential for photosynthesis to occur.

Reasoning (R):

Chlorophyll absorbs light energy to convert CO_2 and water into glucose and oxygen.

Inference (I):

Without adequate light, plants cannot produce food through photosynthesis.

Evaluate the correctness of the assertion, reasoning, and inference.

- **A.** All are wrong
- **B.** A is wrong, R is wrong, I is correct
- **C.** A is correct, R is correct, I is wrong
- **D.** A is correct, R is wrong, I is correct
- **E.** A is correct, R is correct, I is correct
- **F.** A is wrong, R is correct, I is correct

15. **Statement:**

The STATEMENT placeholder gets replaced with one statement from the statements array during rendering.

This question uses STATEMENT placeholder for a single statement (rare case).

How does the STATEMENT placeholder work?

- **A.** It creates a numbered list
- **B.** It shows only the label
- **C.** It displays single statement content
- **D.** It hides the statement text

16. *This question demonstrates multiple text blocks around STATEMENTS placeholder.*

The structure is: text, text, STATEMENTS, text.

Example Statement:

There are text blocks before and after the STATEMENTS placeholder.

Structure Note:

This creates a more complex question format with multiple parts.

Usage Info:

You can have up to 3 or more statements in the statements array.

How many text blocks surround the STATEMENTS placeholder in this question?

- **A.** 2 text blocks (before only)
- **B.** 3 text blocks (2 before, 1 after)
- **C.** 1 text block (after only)
- **D.** 4 text blocks total

17. *Consider the following statements about the water cycle:*

Statement I:

Water evaporates from oceans, lakes, and rivers due to solar energy.

Statement II:

Condensation occurs when water vapor cools and forms droplets in clouds.

Which statements are correct?

- **A.** Statement I only
- **B.** Statement II only
- **C.** Both Statement I and Statement II
- **D.** Neither statement

PARAGRAPH Placeholder Format

This section demonstrates how the PARAGRAPH placeholder in question_text works with paragraph field to display short paragraph content.

18. *Read the statement about chemical reactions:*

Chemical reactions need activation energy to proceed.

What is required for reactions to occur?

- **A.** Low temperature
- **B.** High pressure
- **C.** Activation energy
- **D.** Presence of water

19. *This question shows intro-text, PARAGRAPH, question-text structure.*

    The PARAGRAPH placeholder is positioned between introduction and question text, creating a three-part structure.

    What pattern does this question demonstrate?

    A. PARAGRAPH-intro-question structure
    B. intro-question-PARAGRAPH structure
    C. question-PARAGRAPH-intro structure
    D. intro-PARAGRAPH-question structure

20. *This question uses PARAGRAPH placeholder to display content from paragraph field.*

    The PARAGRAPH placeholder gets replaced with the text from the paragraph field during rendering.

    How does the PARAGRAPH placeholder work?

    A. It displays the paragraph field content
    B. It creates multiple paragraphs
    C. It shows only formatted text
    D. It hides the paragraph text

21. *Consider the following information about ecosystems:*

    Decomposers are vital organisms in ecosystems that break down dead organic matter from plants and animals. They include bacteria, fungi, and certain insects that feed on decaying material. Through their metabolic processes, they decompose complex organic compounds and return essential nutrients like nitrogen, phosphorus, and carbon back to the soil, making these nutrients available for uptake by living plants and continuing the nutrient cycle.

    What role do decomposers play in ecosystems?

    A. They recycle nutrients back to the ecosystem
    B. They provide energy directly to consumers
    C. They control population sizes of other species
    D. They produce oxygen for other organisms

22. *This question demonstrates using \n characters within paragraph text to create line breaks.*

    This is line 1 of the paragraph.
    This is line 2 of the paragraph.
    This is line 3 of the paragraph.

    How many lines are displayed in the paragraph above?

    A. 1 line
    B. 3 lines
    C. 4 lines
    D. 2 lines

23. *Read the following passage about climate change:*

    Climate change refers to long-term shifts in global weather patterns and temperatures. Since the Industrial Revolution, human activities have dramatically increased the concentration of greenhouse gases in Earth's atmosphere, particularly carbon dioxide from burning fossil fuels, deforestation, and industrial processes.

    These greenhouse gases trap heat from the sun, causing global temperatures to rise at an unprecedented rate. Scientists have concluded that human activities are the primary driver of climate change observed since the mid-20th century, with natural climate variations playing a much smaller role.

    What is identified as the primary driver of current climate change?

    A. Human activities and greenhouse gas emissions
    B. Deforestation only
    C. Solar radiation changes
    D. Natural climate variations

MTF (Match The Following) Placeholder Format

This section demonstrates how the MTF_DATA placeholder in question_text works with mtf_data object to display match-the-following questions with left and right columns.

24. *This question uses MTF_DATA placeholder to display match-the-following content from mtf_data object.*

Example Left Column	-	Example Right Column
a. Left Item 1	-	Right Item 1
b. Left Item 2	-	Right Item 2

    How does the MTF_DATA placeholder work?

    A. It shows only the headers
    B. It creates a single list
    C. It hides the matching data
    D. It displays the mtf_data object content in two columns

25.
Chemical Elements	-	Atomic Numbers
Hydrogen	-	2
Helium	-	1
Lithium	-	4
Beryllium	-	3

    How many of the above are correctly matched?

    A. 0 correctly matched
    B. 3 correctly matched
    C. 1 correctly matched
    D. 2 correctly matched

26. *Match the chemical elements with their symbols:*

Elements	-	Chemical Symbols
i. Sodium	-	a. Ca
ii. Potassium	-	b. Na
iii. Calcium	-	c. Mg
iv. Magnesium	-	d. K

    Which option shows the correct matching?

    A. i-c, ii-a, iii-d, iv-b
    B. i-a, ii-c, iii-b, iv-d
    C. i-b, ii-d, iii-a, iv-c
    D. i-d, ii-b, iii-c, iv-a

27.

Planets	-	Distance from Sun (million km)
Mercury	-	227.9
Venus	-	57.9
Earth	-	149.6
Mars	-	108.2

Which planet is closest to the Sun according to the data above?

A. Mars   **B.** Mercury

C. Venus   **D.** Earth

28. *This question demonstrates intro-text, MTF_DATA, question-text structure.*

Structure Parts	-	Descriptions
a. Part 1	-	Question text after MTF_DATA
b. Part 2	-	Introduction text before MTF_DATA
c. Part 3	-	MTF_DATA placeholder in middle

What pattern does this question demonstrate?

A. intro-MTF_DATA-question structure

B. intro-question-MTF_DATA structure

C. MTF_DATA-intro-question structure

D. question-MTF_DATA-intro structure

Mixed Placeholder Combinations

This section demonstrates using multiple placeholders together in a single question, showing various combinations like PARAGRAPH + LIST, STATEMENTS + PARAGRAPH, etc.

29. *Examine the business case study:*

TechCorp's market share declined from 25% to 18% over two years. Competitor analysis reveals that rivals invested heavily in AI-powered features while TechCorp focused on cost reduction. Customer feedback indicates demand for innovative solutions over price cuts.

Consider these strategic options:

I. Reduce prices further
II. Invest in AI technology
III. Maintain current strategy
IV. Exit the market

Evaluate the following analysis:

Strategic Analysis (S):

Investment in innovation aligns with customer demand and competitive trends.

Market Reality (M):

Price reduction strategy failed to prevent market share loss.

Which combination of option and reasoning is most sound?

A. Option I + Analysis S

B. Option IV + Neither S nor M

C. Option II + Both S and M

D. Option III + Analysis M

30. *Consider the following experimental conditions:*

α. Temperature increased to 25°C
β. pH maintained at 7.0
γ. Light exposure for 12 hours daily
δ. Nutrient solution concentration doubled

Evaluate the hypothesis:

Hypothesis (H):

Plant growth rate increases with optimal light exposure.

Reasoning (R):

Photosynthesis efficiency directly depends on adequate light availability.

Which experimental condition best supports the reasoning provided?

A. Condition γ (light exposure)   **B.** Condition β (pH)

C. Condition α (temperature)

D. Condition δ (nutrients)

31. **Statement I:**

Regular exercise improves cardiovascular health.

Statement II:

Proper nutrition supports muscle recovery.

Based on the statements above:

1. Statement I + Daily cardio routine
2. Statement II + Protein-rich diet
3. Both statements + Comprehensive fitness plan
4. Neither statement + Sedentary lifestyle

Which combination of statement and action is most appropriate?

A. Option 4 (no action needed)   **B.** Option 1 only

C. Option 3 (comprehensive approach)

D. Option 2 only

32. *Review the following research findings:*

Recent studies on sleep deprivation show significant impacts on cognitive function, memory consolidation, and emotional regulation. Participants with less than 6 hours of sleep showed 40% reduced problem-solving ability and increased stress hormone levels.

Match the findings with their implications:

Sleep Duration	-	Primary Effect
Less than 6 hours	-	Optimal cognitive function
6-7 hours	-	Reduced problem-solving ability
8+ hours	-	Moderate cognitive performance

How many matches are scientifically accurate?

A. 3 matches are accurate

B. 0 matches are accurate

C. 2 matches are accurate   **D.** 1 match is accurate

33. *Study the research data:*

Study Groups	-	Success Rate (%)
Group A	-	85
Group B	-	72
Group C	-	91

Read the analysis:

The data shows varying success rates across different study groups. Group C demonstrated the highest performance, likely due to enhanced preparation methods and consistent practice schedules implemented throughout the study period.

Based on both the data and analysis, what conclusion can be drawn?

A. All groups performed equally well

B. Group C had the most effective study methods

C. Group A performed best overall

D. The data is insufficient to draw conclusions

34. *Read the background information:*

Climate change requires immediate action through renewable energy adoption. The primary challenge is transitioning from fossil fuel dependency while maintaining economic stability.

Consider the following options:

a. Increase coal production
b. Invest in solar and wind energy
c. Ignore environmental concerns
d. Wait for future technology

Which option best addresses the main concern mentioned in the paragraph?

A. Option a   **B.** Option c

C. Option d   **D.** Option b

35. *Analyze the following scenario:*

A company's quarterly sales dropped by 15% compared to the previous quarter. The marketing budget was reduced by 30% during the same period, while competitor spending increased by 20%.

Evaluate these statements:

Assertion (A):

Reduced marketing budget contributed to the sales decline.

Reasoning (R):

Marketing investment directly correlates with brand visibility and customer acquisition.

What is the most logical conclusion?

A. Both A and R are incorrect

B. A is correct, R is incorrect

C. Both A and R are correct, R explains A

D. Both A and R are correct, R doesn't explain A

36. *This question demonstrates PARAGRAPH + LIST combination usage.*

This paragraph provides context before the list items are displayed.

i. First list item after paragraph
ii. Second list item
iii. Third list item

How many placeholders are used in this question structure?

A. 2 placeholders (PARAGRAPH + LIST)

B. 1 placeholder (PARAGRAPH only)

C. 3 placeholders including text

D. No placeholders used

✳ ✳ ✳ ✳ **END** ✳ ✳ ✳ ✳