

# **SAMPLE PAPER — USAT — GENERAL SCIENCE**

## **FULLY SOLVED VERSION**

This document contains the complete set of Verbal Reasoning, Quantitative Reasoning, Mathematics, Statistics, and Economics multiple-choice questions with the correct answer highlighted and a clear explanation given below each question. Sample solved essays are provided at the end of the paper.

## VERBAL REASONING

1. He lost his \_\_\_\_\_ when the policeman stopped him.

- A. character
- B. language
- C. pride

✓ **D. temper (Correct Answer)**

**Explanation:** "Lost his temper" is a common English idiom meaning to suddenly become very angry. None of the other words (character, language, pride) form a natural idiomatic phrase with "lost his \_\_\_\_" in this context, so "temper" is the only word that completes the sentence correctly.

2. Open your workbook \_\_\_\_\_ page 7.

✓ **A. at (Correct Answer)**

- B. in
- C. on
- D. through

**Explanation:** The preposition "at" is used with a specific page number (e.g., "open the book at page 7"). "On" is used when referring to content already appearing on a page (e.g., "the answer is on page 7"), while "in" and "through" do not fit this fixed expression.

### 3. PETAL : FLOWER ::

- A. base : ball
- B. puppy : dog
- C. sandals : shoes

✓ D. tire : bicycle (Correct Answer)

**Explanation:** A petal is a physical part/component of a flower. In the same way, a tire is a physical part/component of a bicycle. "Puppy : dog" is a young-animal relationship, "sandals : shoes" is a type-of relationship, and "base : ball" is not a standard whole-part pair, so only "tire : bicycle" matches the part-to-whole relationship of "petal : flower."

### 4. BINDING : BOOK ::

- A. artist : carpenter
- B. display : museum

✓ C. frame : picture (Correct Answer)

- D. nail : hammer

**Explanation:** The binding is the structural covering that holds a book together and displays it as a finished object. Similarly, a frame holds and displays a picture. "Nail : hammer" is a tool-and-object relationship, not a covering/holding relationship, so "frame : picture" is the closest match.

5. If something is HORRIFIC it is not \_\_\_\_\_.

- A. complete
- B. frightening
- C. important

✓ **D. pleasant (Correct Answer)**

**Explanation:** "Horrific" means extremely shocking or frightening. Its opposite is something that is "pleasant" (agreeable, enjoyable). "Frightening" is actually a synonym, not an opposite, so "pleasant" is the correct antonym.

6. If you are DARING, you are \_\_\_\_\_.

- A. careful
- C. powerful
- D. wealthy

✓ **B. courageous (Correct Answer)**

**Explanation:** "Daring" means willing to take risks; it is a synonym of "courageous" (brave). "Careful" is almost an opposite of daring, while "powerful" and "wealthy" describe unrelated qualities.

**Passage (Questions 7–8):** At that time everyone believed that the Earth was at the centre of the universe. But Copernicus realized that this picture did not agree with astronomical observations. He worked out that the Sun was at the centre with all the planets moving around it. He said that our Earth takes a year to travel around the Sun, and also revolves once every 24 hours. Copernicus believed that the planets moved around the Sun in perfect circles. Fifty years later, Kepler used Tycho Brahe's extremely accurate measurements to show that they do not.

**7. Copernicus' belief that the Sun was at the centre of the universe was based on \_\_\_\_\_.**

A. common sense

✓ **B. his astronomical observations (Correct Answer)**

C. mathematical calculations

D. observations of other astronomers

**Explanation:** The passage states that Copernicus "realized that this picture did not agree with astronomical observations" and then worked out the Sun-centred model himself — this shows his conclusion was grounded in his own astronomical observations, not common sense, pure mathematics, or someone else's observations.

8. The belief that the earth was at the centre of the universe was held at that time by \_\_\_\_\_.

A. Copernicus

✓ B. everybody (Correct Answer)

C. the uneducated persons

D. nobody

**Explanation:** The very first line of the passage says "everyone believed that the Earth was at the centre of the universe," which directly tells us the belief was held by everybody at that time, not just an uneducated group, and certainly not by Copernicus, who rejected the idea.

## QUANTITATIVE REASONING

9. Evaluate  $2\{[59 + (-42)] + [-75 - (-120)]\} =$  \_\_\_\_\_.

A. -124

B. -62

C. 62

✓ D. 124 (Correct Answer)

**Explanation:** First bracket:  $59 + (-42) = 17$ . Second bracket:  $-75 - (-120) = -75 + 120 = 45$ . Adding them:  $17 + 45 = 62$ . Multiplying by 2:  $2 \times 62 = 124$ .

10. A train is moving with a speed of 90 Km/h. Find the distance covered by the train in 9 minutes.

A. 12km

B. 13km

✓ C. 13.5km (Correct Answer)

D. 135km

**Explanation:** Speed = 90 km/h =  $90/60 = 1.5$  km per minute. Distance in 9 minutes =  $1.5 \times 9 = 13.5$  km.

11. If  $f(x) = (x + 3)^2$  and  $f(x) = 16$ , then  $x =$  \_\_\_\_\_.

A. -1, -7

✓ B. 1, -7 (Correct Answer)

C. -1, 7

D. 7, 1

**Explanation:**  $(x + 3)^2 = 16$  ■  $x + 3 = \pm 4$ . Taking +4:  $x = 1$ . Taking -4:  $x = -7$ . So  $x = 1$  or  $x = -7$ .

12. In 24 hours, the hands of the clock meet each other \_\_\_\_\_ times.

A. 20

B. 21

✓ C. 22 (Correct Answer)

D. 24

**Explanation:** In every 12-hour period the hour and minute hands coincide 11 times (not 12, because the overlap at 12:00 is shared with the start of the next cycle). Over 24 hours this happens  $2 \times 11 = 22$  times.

13.  $\cos 57^\circ =$  \_\_\_\_\_.

A.  $\sec 33^\circ$

✓ B.  $\sin 33^\circ$  (Correct Answer)

C.  $\sin 57^\circ$

D.  $\tan 33^\circ$

**Explanation:** Using the co-function identity  $\cos \theta = \sin(90^\circ - \theta)$ :  $\cos 57^\circ = \sin(90^\circ - 57^\circ) = \sin 33^\circ$ .

14. If 420 men have sufficient food for 32 days, how many men remained so that the same food be sufficient for 42 days?

- A. 50
- B. 100
- C. 131

✓ D. 320 (Correct Answer)

**Explanation:** Total food =  $420 \times 32 = 13440$  man-days.  
For the food to last 42 days: number of men =  $13440 \div 42 = 320$  men. So 320 men should remain, meaning  $420 - 320 = 100$  men were removed, but the question asks how many men remained, which is 320.

## MATHEMATICS

15. Absolute value of  $2 + 3i$  is \_\_\_\_\_.

- A. 2
- B. 3
- C.  $\sqrt{5}$

✓ D.  $\sqrt{13}$  (Correct Answer)

**Explanation:** For a complex number  $a + bi$ , the absolute value (modulus) is  $\sqrt{a^2 + b^2}$ . Here  $|2 + 3i| = \sqrt{(2^2 + 3^2)} = \sqrt{(4 + 9)} = \sqrt{13}$ .

16.  $A - B =$  \_\_\_\_\_.

- A.  $A' \cap B$
- B.  $A \cup B$
- C.  $A \cap B$

✓ D.  $A \cap B'$  (Correct Answer)

**Explanation:** The set difference  $A - B$  consists of all elements that are in  $A$  but not in  $B$ . In set notation this is exactly the intersection of  $A$  with the complement of  $B$ , i.e.  $A \cap B'$ .

17. The value of  $dy/dx$  in  $x^2y^2 - 3 = 0$  is \_\_\_\_\_.

A.  $x/y$

B.  $-x/y$

C.  $y/x$

✓ D.  $-y/x$  (Correct Answer)

**Explanation:** Differentiating  $x^2y^2 = 3$  implicitly with respect to  $x$  using the product rule:  $2xy^2 + x^2 \cdot 2y \cdot (dy/dx) = 0$ . Solving for  $dy/dx$ :  $dy/dx = -2xy^2 / (2x^2y) = -y/x$ .

## STATISTICS

18.  $1^2 + 2^2 + 3^2 + \dots + n^2 = \sum_{k=1}^n k^2 = \underline{\hspace{2cm}}$ .

A.  $n^2$

B.  $(2n + 1)(n + 1)/6$

C.  $n(n + 1)/2$

✓ D.  $n(2n + 1)(n + 1)/6$  (Correct Answer)

**Explanation:** This is the standard formula for the sum of the squares of the first  $n$  natural numbers:  $\sum k^2 = n(n + 1)(2n + 1)/6$ . Option C,  $n(n+1)/2$ , is instead the formula for the sum of the first  $n$  natural numbers (not their squares).

19. If variance of a data is 100 and its mean is 50 then the value of coefficient of variation is  $\underline{\hspace{2cm}}$ .

✓ A. 20% (Correct Answer)

B. 50%

C. 100%

D. 200%

**Explanation:** Standard deviation =  $\sqrt{\text{variance}} = \sqrt{100} = 10$ .  
Coefficient of variation (CV) =  $(\text{Standard deviation} / \text{Mean}) \times 100 = (10 / 50) \times 100 = 20\%$ .

20. Prices and quantities both are used for computing

\_\_\_\_\_.

- A. chain relatives
- B. link relatives
- C. price relatives

✓ D. weighted index numbers (Correct Answer)

**Explanation:** Weighted index numbers combine both the price of items and their quantities (used as weights) to reflect the relative importance of each item. Simple price relatives, link relatives, and chain relatives use price data alone, without quantity weighting.

## ECONOMICS

21. The production cost which changes directly with change in the level of output is called \_\_\_\_\_ cost.

- A. fixed
- B. historical
- C. indirect

✓ **D. variable (Correct Answer)**

**Explanation:** Variable costs rise and fall directly with the level of output (e.g., raw materials, direct labour). Fixed costs, by contrast, stay the same regardless of output level.

22. The change in total product by increasing one unit of input is called \_\_\_\_\_ product.

- A. average
- B. fixed

✓ **C. marginal (Correct Answer)**

- D. total

**Explanation:** Marginal product is defined as the additional output produced when one more unit of a variable input (such as labour) is employed, holding other inputs constant.

23. Which of the following terms is used for the purpose that a buyer must pay for the goods at the time of its delivery?

A. Barter

✓ B. Cash on delivery (Correct Answer)

C. Give and take

D. Payment on delivery

**Explanation:** "Cash on delivery" (COD) is the standard commercial term for a payment arrangement in which the buyer pays for goods at the moment they are delivered, rather than in advance or on credit.

## ESSAYS — SOLVED

Below is one complete, model answer for each essay task, written in English as permitted by the paper's instructions.

### Question 24 (Argumentative Essay, 15 Marks)

*Topic Chosen: Does technology limit creativity?*

Technology has become an inseparable part of modern life, shaping the way people learn, work, and express themselves. A common criticism is that technology limits creativity because it offers ready-made solutions, templates, and instant answers that discourage original thinking. However, a closer examination shows that technology, when used thoughtfully, expands creative possibilities far more than it restricts them.

Critics argue that easy access to information and pre-designed tools reduces the need for independent thought. A student who can search for an essay outline online, for example, may never develop the skill of building an argument from scratch. Similarly, software filters and templates in photography or design can produce polished results without requiring the user to understand the underlying artistic principles. In this sense, technology can create a dependency that weakens original problem-solving.

On the other hand, technology has historically been one of the greatest enablers of creative expression. Digital art software, music production tools, and video editing platforms have given millions of people the means to create work that would once

have required expensive equipment or specialised training. Online platforms allow artists, writers, and musicians to reach global audiences instantly, and collaborative tools make it possible for people from different countries to build creative projects together in real time. Rather than limiting imagination, these tools remove technical barriers so that ideas can be realised more freely.

The real determinant of creativity is not the technology itself but how it is used. A person who relies entirely on automated templates without adding personal insight will indeed produce uninspired work. But a person who uses technology as a tool to experiment, iterate, and refine their ideas can achieve a level of creative output that was previously impossible. Word processors do not stop a novelist from imagining an original story; they simply make editing faster. Digital tools do not prevent a musician from composing an original melody; they allow that melody to be recorded, layered, and shared with ease.

In conclusion, technology does not inherently limit creativity. It is a double-edged tool whose impact depends entirely on the intent and effort of the person using it. When approached with curiosity and critical thinking, technology becomes an amplifier of imagination rather than a constraint upon it. The responsibility, therefore, lies with individuals and educators to use technology in ways that nurture originality instead of replacing it.

## Question 25 (Narrative Essay, 10 Marks)

*Topic Chosen: A day at the Amusement Park.*

The morning sun had barely risen when my cousins and I set off for the amusement park, our excitement bubbling over long before we reached the gates. We had been planning this trip for weeks, and as the tall roller coaster loomed into view from the parking lot, I felt my nervousness mix with pure delight.

As soon as we entered, the air was filled with the smell of popcorn and cotton candy, and the cheerful music from the carousel echoed across the park. We decided to start with the Ferris wheel, watching the entire park shrink beneath us as we rose higher and higher. From the top, the roller coasters looked like twisted ribbons of steel, and the lake in the centre of the park sparkled under the morning light.

After the calm of the Ferris wheel, we mustered our courage for the main attraction, the towering roller coaster. My heart pounded as the cart clicked slowly up the first steep climb, and for a brief moment at the top, the whole park stretched silently before us. Then, in an instant, we plunged downward, screaming with a mixture of terror and joy as the cart twisted and looped through the track. When it finally came to a stop, my legs were shaking, but I could not stop laughing.

We spent the rest of the afternoon trying different rides, sharing a giant tub of popcorn, and competing at the game stalls, where my younger cousin finally won a stuffed bear after three attempts. As evening approached, the park lit up with

colourful lights, and we ended the day watching a dazzling fireworks display that lit up the sky in bursts of red, gold, and blue.

Walking back to the car, tired but happy, I realised that it was not just the rides that had made the day special, but the laughter we shared and the memories we created together. That day at the amusement park remains one of the most joyful experiences of my life, a perfect blend of thrill, wonder, and togetherness.