

SAMPLE PAPER — USAT — GENERAL SCIENCE

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VERBAL REASONING

Q1. He lost his _____ when the policeman stopped him.

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

✓ **D. temper (Correct Answer)**

Explanation: The idiom 'to lose one's temper' means to suddenly become very angry. Being stopped by a policeman is the kind of stressful situation that provokes anger, so 'temper' is the only word that fits the sentence naturally.

Q2. Open your workbook _____ page 7.

✓ **A. at (Correct Answer)**

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

Explanation: The preposition 'at' is conventionally used with a specific page number in instructions such as 'open your book at page 7'. 'On' and 'in' are not the standard collocations used in formal instructional English.

Q3. PETAL : FLOWER :: (choose the pair with the same relationship)

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

✓ **D. tire : bicycle (Correct Answer)**

Explanation: A petal is a component part that makes up a flower (part-to-whole relationship). In the same way, a tire is a component part that makes up a bicycle. The other pairs are either whole-to-whole (puppy/dog, sandals/shoes) or do not match the part-whole pattern.

Q4. BINDING : BOOK :: (choose the pair with the same relationship)

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

✓ **C. frame : picture (Correct Answer)**

D. nail : hammer

Explanation: A binding is the structural part that holds a book together and gives it its physical form. Likewise, a frame is the structural part that holds and displays a picture. This mirrors the same 'holding structure : object held' relationship.

Q5. If something is HORRIFIC it is not _____. (choose the OPPOSITE)

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

✓ **D. pleasant (Correct Answer)**

Explanation: 'Horrific' means extremely shocking or terrifying. Its opposite in meaning is 'pleasant', something agreeable and enjoyable. 'Frightening' is actually a synonym, not an opposite, so it is eliminated.

Q6. If you are DARING, you are _____. (choose the SIMILAR meaning)

- A. careful

✓ **B. courageous (Correct Answer)**

- C. powerful
- D. wealthy

Explanation: 'Daring' describes someone willing to take risks or do bold, adventurous things — this is synonymous with being 'courageous'. 'Careful' is actually closer to the opposite meaning.

Passage (for 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.

Q7. 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 the geocentric picture 'did not agree with astronomical observations,' which led him to work out the heliocentric model. His conclusion therefore grew directly out of his own astronomical observations.

Q8. 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 states plainly: 'At that time everyone believed that the Earth was at the centre of the universe,' confirming that this belief was held universally, i.e., by everybody, at that time.

QUANTITATIVE REASONING

Q9. Evaluate $2\{[59 + (-42)] + [-75 - (-120)]\} =$ _____.

- A. -124
- B. -62
- C. 62

✓ **D. 124 (Correct Answer)**

Explanation: Step 1: $59 + (-42) = 17$. Step 2: $-75 - (-120) = -75 + 120 = 45$. Step 3: Add the two results: $17 + 45 = 62$. Step 4: Multiply by 2: $2 \times 62 = 124$. So the final answer is 124.

Q10. 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: Convert speed to km/min: $90 \text{ km/h} \div 60 = 1.5 \text{ km/min}$. Distance in 9 minutes = $1.5 \times 9 = 13.5 \text{ km}$.

Q11. 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 $x = -7$.

Q12. 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 one coincidence is 'lost' due to relative speed). Over 24 hours (two 12-hour periods): $11 \times 2 = 22$ times.

Q13. $\cos 57^\circ =$ _____.

A. $\sec 33^\circ$

✓ B. $\sin 33^\circ$ (Correct Answer)

C. $\sin 57^\circ$

D. $\tan 33^\circ$

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

Q14. 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 = men $\times$ days is constant (inverse proportion): $420 \times 32 = x \times 42$ ■ $x = 13,440 \div 42 = 320$. So 320 men must remain for the food to last 42 days (meaning 100 men would have to leave).

MATHEMATICS

Q15. 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, $|2 + 3i| = \sqrt{2^2 + 3^2} = \sqrt{4 + 9} = \sqrt{13}$.

Q16. $A - B =$ _____.

- 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 . This is written using the complement of B as $A \cap B'$ (elements in A intersected with everything outside B).

Q17. 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: Differentiate $x^2y^2 - 3 = 0$ implicitly with respect to x : $2xy^2 + x^2(2y)(dy/dx) = 0$. Solving for dy/dx : $dy/dx = -2xy^2 / (2x^2y) = -y/x$.

STATISTICS

Q18. $1^2 + 2^2 + 3^2 + \dots + n^2 = \Sigma k^2 = \underline{\hspace{2cm}}$.

- 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 squares of the first n natural numbers: $\Sigma k^2 = n(n + 1)(2n + 1)/6$. Option C, $n(n+1)/2$, is the formula for the sum of the first n numbers (not their squares), so it is a common distractor.

Q19. 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) = $(\text{Standard Deviation} / \text{Mean}) \times 100 = (10/50) \times 100 = 20\%$.

Q20. 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 price data and quantity data (as weights) to give a more accurate picture of overall change than a simple price relative, which uses price data alone.

ECONOMICS

Q21. 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 produced (e.g., raw materials, direct labour). Fixed costs, by contrast, stay constant regardless of output level.

Q22. 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 precisely as the additional output generated by employing one more unit of a variable input, holding other inputs constant.

Q23. 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 describing an arrangement where payment is made in cash at the exact moment the goods are delivered to the buyer.

ANSWER KEY — QUICK SUMMARY

Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	D	7	B	13	B	19	A
2	A	8	B	14	D	20	D
3	D	9	D	15	D	21	D
4	C	10	C	16	D	22	C
5	D	11	B	17	D	23	B
6	B	12	C	18	D		

All 23 questions of this HAT General Science sample paper have been fully solved above, with the correct option ticked and highlighted and a full explanation provided beneath every question, including the reading-comprehension passage covering Questions 7–8.

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