

SAMPLE PAPER – USAT / HAT

Computer Science Track — Fully Solved with Explanations

VERBAL REASONING

Q1. Naima met Salma _____ the afternoon.

- A. after
- B. at
- C. before

✓ **D. in (Correct Answer)**

Explanation:

The preposition “in” is used with parts of the day such as “in the morning,” “in the afternoon,” and “in the evening.” “At” is reserved for “at night,” so “in the afternoon” is the correct usage.

Q2. The Queen fell _____ ill and all hopes of her recovery vanished.

- A. easily
- B. hardly
- C. scarcely

✓ **D. seriously (Correct Answer)**

Explanation:

“Seriously ill” is the correct collocation for a severe illness that removes hope of recovery. “Easily,” “hardly,” and “scarcely” do not logically fit with the idea of losing hope of recovery.

Q3. BELL : RING ::

- A. clock : watch
- B. guitar : music
- C. paper : pencil

✓ **D. wind : whistle (Correct Answer)**

Explanation:

A bell produces the sound “ring” just as wind produces the sound “whistle.” The relationship is object → the characteristic sound it makes, which matches only option D.

Q4. HELP : HINDER ::

✓ **A. hurry : delay (Correct Answer)**

- B. smile : laugh
- C. steal : thief
- D. travel : journey

Explanation:

HELP and HINDER are antonyms (opposites). Only “hurry : delay” shows the same antonym relationship, since to hurry is the opposite of to delay.

Q5. A LOAFER is one who does not like to _____.

- A. shake
- B. sing
- C. smile

✓ **D. work (Correct Answer)**

Explanation:

A “loafer” is a lazy, idle person who avoids effort or labour, so the sentence is completed by “work” — a loafer does not like to work.

Q6. If information gets MIX-UP, it becomes _____.

✓ **A. confusing (Correct Answer)**

- B. dangerous
- C. old
- D. sensitive

Explanation:

“Mix-up” means a state of confusion or disorder, so information that gets mixed up becomes “confusing.” This is the closest synonym among the choices.

Passage for Questions 7–8

Syed Ahmed had gone to England on a dual mission to learn and to teach. His mission of learning was fulfilled as well as it might be in a year and five months. He had learnt enough to understand what was there in the character, manner, modes, and instructions of the British that had made them rulers of a vast empire. His teaching mission,

however, was not so successful. The British were not interested in being taught to understand and respect Islam. They had more important things to think about — the discoveries and inventions of science, the reforms of society, human progress, and freedom of thought and individual liberty. As for religion, Christianity was considered good enough, whether as a mythology, a moral code, or a ritual system. Syed Ahmed, therefore, had to find other pupils to teach. So he came back home full of ambitious plans to impart to his Muslim countrymen all that he had learnt in England, as well as what he had gone there to teach but had been unable to.

Q7. The type of this paragraph is _____.

A. descriptive

B. expository

✓ **C. narrative (Correct Answer)**

D. science

Explanation:

The paragraph recounts a sequence of events in Syed Ahmed's life — his journey to England, what he learned, and what happened when he tried to teach — told in story form. This chronological, event-driven structure makes it a narrative paragraph.

Q8. The paragraph revolves around _____.

✓ A. Syed Ahmed's dual mission (Correct Answer)

B. Syed Ahmed's failure to teach

C. Syed Ahmed's help for Muslims

D. Syed Ahmed's visit to England

Explanation:

The opening line states Syed Ahmed went to England "on a dual mission to learn and to teach," and the whole paragraph tracks the outcome of both parts of that mission, making "Syed Ahmed's dual mission" the central theme.

QUANTITATIVE REASONING

Q9. Evaluate $[-30 + 47] - 2[15 + (-119)] =$ _____.

A. -289

B. -191

C. 191

✓ D. 225 (Correct Answer)

Explanation:

Step 1: $[-30 + 47] = 17$. Step 2: $[15 + (-119)] = -104$, so $-2 \times (-104) = 208$. Step 3: $17 + 208 = 225$. The final answer is 225.

Q10. Which of the following is a binary operation?

✓ **A. Intersection (Correct Answer)**

B. Square

C. Square root

D. Transpose

Explanation:

A binary operation takes exactly two inputs (elements) and produces one output. Intersection combines two sets ($A \cap B$) into one, making it binary. Square, square root, and transpose are all unary operations — they act on a single input.

Q11. A train is moving with a speed of 30 km/h and crosses a pole in 21 seconds. The length of the train is _____.

A. 25m

B. 150m

✓ **C. 175m (Correct Answer)**

D. 630m

Explanation:

Convert speed to m/s: $30 \text{ km/h} = 30 \times (5/18) = 25/3 \text{ m/s} \approx 8.33 \text{ m/s}$. Distance (= length of train, since it just crosses a stationary pole) = speed $\times$ time = $(25/3) \times 21 = 175 \text{ m}$.

Q12. If $f(x) = (x^2 - 3)$ and $f(x) = 1$, then the value of x is

_____.

A. -3, 2

B. 2, -3

✓ C. -2, 2 (Correct Answer)

D. 4, -2

Explanation:

Set $x^2 - 3 = 1$, so $x^2 = 4$. Taking the square root of both sides gives $x = \pm 2$, i.e. $x = 2$ or $x = -2$.

Q13. In a tournament, 8 teams were playing. Each team has to play a match with every other team. Two semifinals and one final are played. How many total matches were played?

✓ **A. 25 (Correct Answer)**

B. 28

C. 31

D. 34

Explanation:

As per the official answer key, the intended answer is 25. Note for accuracy: a pure round-robin among 8 teams (every team plays every other team once) works out to $8C2 = 28$ matches by the standard combination formula $n(n-1)/2 = (8 \times 7)/2 = 28$, which would already include all games including the eventual “semifinal” and “final” match-ups. We are flagging this because the original question wording is ambiguous about tournament structure (round-robin vs. group + knockout stages), so readers attempting this question by a different method may arrive at 28 instead of 25 — both are defensible depending on the assumed format.

Q14. The angle between the hands of a clock at 4:30 is

- _____.
- A. 30°
 - B. 35.5°
 - C. 37.5°

✓ **D. 40° (Correct Answer)**

Explanation:

As per the official answer key, the marked answer is 40° .
Note for accuracy: using the standard clock-angle method —
minute hand position = $6 \times M = 6 \times 30 = 180^\circ$, hour hand
position = $30 \times H + 0.5 \times M = 30 \times 4 + 0.5 \times 30 = 135^\circ$ — the
angle between the hands works out to $|180^\circ - 135^\circ| = 45^\circ$.
This does not exactly match any of the listed options, which
suggests a possible discrepancy in the original
question/options. We recommend double-checking this item
against the official test-maker's key.

PHYSICS

Q15. The mathematical formula $F = ma$ belongs to

_____.

A. Newton's First Law

✓ **B. Newton's Second Law (Correct Answer)**

C. Newton's Third Law

D. Newton's Law of Interference

Explanation:

Newton's Second Law states that force equals mass times acceleration ($F = ma$), describing how the net force on an object relates to its mass and resulting acceleration.

Q16. Which one of the following mechanisms is exhibited by an oil film floating on a water surface with a powerful colour pattern?

A. Diffraction of light

✓ **B. Interference of light (Correct Answer)**

C. Reflection of light

D. Refraction of light

Explanation:

The colourful pattern seen in a thin oil film on water is caused by interference of light waves reflecting off the top and bottom surfaces of the thin film, which combine constructively or destructively at different wavelengths to produce the visible colour bands.

Q17. Which of the following is the maximum value reached by the voltage or current in one cycle of alternating current?

A. Instantaneous value

B. Peak to peak value

✓ **C. Peak value (Correct Answer)**

D. Root mean square value

Explanation:

The “peak value” (or amplitude) is the maximum value reached by voltage or current during one cycle of an AC waveform. “Peak-to-peak” measures the total swing from minimum to maximum, and RMS gives an effective average, not the single highest instantaneous point.

COMPUTER SCIENCE

Q18. A computer register is a _____ in computer operation.

✓ **A. memory type (Correct Answer)**

- B. network device
- C. physical device
- D. program type

Explanation:

A register is a small, high-speed storage location inside the CPU used to hold data, instructions, or addresses temporarily during processing — functionally it is a type of very fast memory.

Q19. 'Bootstrap' specifically helps in the _____ process of a computer.

- A. arithmetic
- B. backup
- C. networking

✓ **D. turn-on (Correct Answer)**

Explanation:

“Bootstrapping” (booting) is the process that starts up a computer when it is turned on, loading the operating system into memory so the system becomes usable.

Q20. The _____ is generally NOT a network topology of computer networks.

A. mesh

B. ring

✓ **C. stage (Correct Answer)**

D. star

Explanation:

Mesh, ring, and star are all standard, well-known network topologies describing how devices are connected. "Stage" is not a recognised network topology, making it the correct choice.

MATHEMATICS

Q21. The sum of the series $2 + 2/3 + 2/9 + \dots$ is _____.

A. 2

✓ **B. 3 (Correct Answer)**

C. 3.4

D. 3.5

Explanation:

This is an infinite geometric series with first term $a = 2$ and common ratio $r = 1/3$ (each term is $1/3$ of the one before it). Since $|r| < 1$, the sum converges to $a / (1 - r) = 2 / (1 - 1/3) = 2 / (2/3) = 3$.

Q22. What is the rank of the matrix with rows [1, 2, 3], [2, 4, 6], and [5, 10, 15]?

✓ **A. 1 (Correct Answer)**

B. 2

C. 3

D. 0

Explanation:

Row 2 = $2 \times$ Row 1, and Row 3 = $5 \times$ Row 1, so all three rows are scalar multiples of each other (linearly dependent). Only one row is linearly independent, so the rank of the matrix is 1.

Q23. Solution of the equation $\sin^2 x = 1$ is _____.

A. $\pi/4, 3\pi/4$

B. $3\pi/4, \pi/2$

C. $\pi/4, 3\pi/2$

✓ **D. $3\pi/2, \pi/2$ (Correct Answer)**

Explanation:

$\sin^2 x = 1$ means $\sin x = \pm 1$. Within the standard range $[0, 2\pi)$, $\sin x = 1$ at $x = \pi/2$ and $\sin x = -1$ at $x = 3\pi/2$, giving the solution set $\{\pi/2, 3\pi/2\}$.

QUICK ANSWER KEY SUMMARY

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

Note: For Q13 and Q14, please see the detailed explanation notes above — our independent calculation flags a possible discrepancy between the source paper's answer key and the standard solving method.