

- 1) A student is required to demonstrate a high level of comprehension of the subject, especially in the social sciences.

The word closest in meaning to comprehension is

- a) understanding
 - b) meaning
 - c) concentration
 - d) stability
- 2) Choose the most appropriate word from the options given below to complete the following sentence.

One of his biggest _____ was his ability to forgive.

- a) vice
 - b) virtues
 - c) choices
 - d) strength
- 3) Rajan was not happy that Sajan decided to do the project on his own. On observing his unhappiness, Sajan explained to Rajan that he preferred to work independently.

Which one of the statements below is logically valid and can be inferred from the above sentences?

- a) Rajan has decided to work only in a group.
 - b) Rajan and Sajan were formed into a group against their wishes.
 - c) Sajan had decided to give in to Rajan's request to work with him.
 - d) Rajan had believed that Sajan and he would be working together.
- 4) If $y = 5x^2 + 3$, then the tangent at $x = 0, y = 3$
- a) passes through $x = 0, y = 0$
 - b) has a slope of +1
 - c) is parallel to the x -axis
 - d) has a slope of -1
- 5) A foundry has a fixed daily cost of Rs 50,000 whenever it operates and a variable cost of Rs $800Q$, where Q is the daily production in tonnes. What is the cost of production in Rs per tonne for a daily production of 100 tonnes?

Q.6 - Q.10 carry two marks each.

- 6) Find the odd one in the following group: ALRVX, EPVZB, ITZDF, OYEIK
- a) ALRVX

- b) EPVZB
- c) ITZDF
- d) OYEIK

- 7) Anuj, Bhola, Chandan, Dilip, Eswar and Faisal live on different floors in a six-storeyed building (the ground floor is numbered 1, the floor above it 2, and so on). Anuj lives on an even-numbered floor. Bhola does not live on an odd numbered floor. Chandan does not live on any of the floors below Faisal's floor. Dilip does not live on floor number 2. Eswar does not live on a floor immediately above or immediately below Bhola. Faisal lives three floors above Dilip. Which of the following floor-person combinations is correct?

	Anuj	Bhola	Chandan	Dilip	Eswar	Faisal
(A)	6	2	5	1	3	4
(B)	2	6	5	1	3	4
(C)	4	2	6	3	1	5
(D)	2	4	6	1	3	5

TABLE 7

- 8) The smallest angle of a triangle is equal to two thirds of the smallest angle of a quadrilateral. The ratio between the angles of the quadrilateral is 3 : 4 : 5 : 6. The largest angle of the triangle is twice its smallest angle. What is the sum, in degrees, of the second largest angle of the triangle and the largest angle of the quadrilateral?
- 9) One percent of the people of country X are taller than 6 ft. Two percent of the people of country Y are taller than 6 ft. There are thrice as many people in country X as in country Y . Taking both countries together, what is the percentage of people taller than 6 ft?
- a) 3.0
 - b) 2.5
 - c) 1.5
 - d) 1.25
- 10) The monthly rainfall chart based on 50 years of rainfall in Agra is shown in the following figure 10.1. Which of the following are true? (k percentile is the value such that k percent of the data fall below that value)

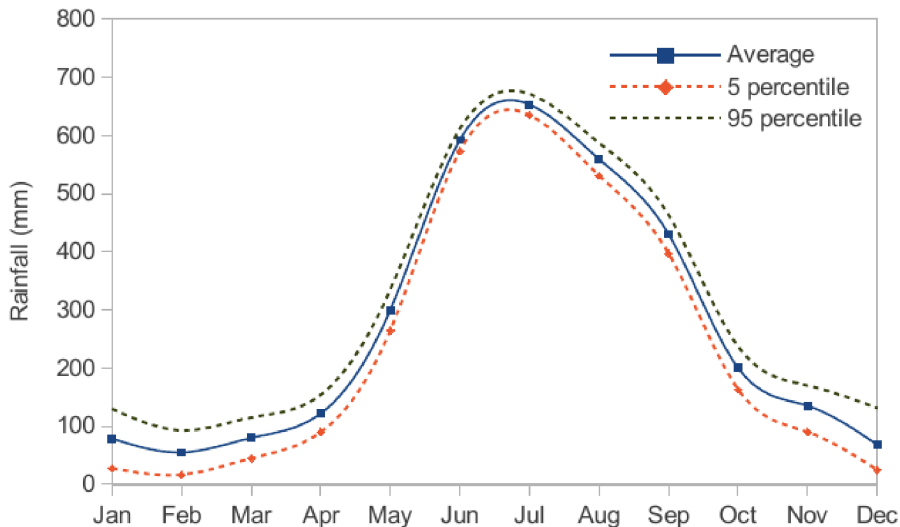


Fig. 10.1

- (i) On average, it rains more in July than in December
 - (ii) Every year, the amount of rainfall in August is more than that in January
 - (iii) July rainfall can be estimated with better confidence than February rainfall
 - (iv) In August, there is at least 500mm of rainfall
- a) (i) and (ii)
 - b) (i) and (iii)
 - c) (ii) and (iii)
 - d) (iii) and (iv)

Q.11 - Q.25 carry one mark each.

- 11) For a real symmetric matrix $[A]$, which of the following statements is true:
- a) The matrix is always diagonalizable and invertible.
 - b) The matrix is always invertible but not necessarily diagonalizable.
 - c) The matrix is always diagonalizable but not necessarily invertible.
 - d) The matrix is always neither diagonalizable nor invertible.
- 12) The series $s = \sum_{m=1}^{\infty} \frac{m^2}{3^m} (x-2)^m$ converges for all x with $|x-2| \leq R$ given by
- a) $R = 0$
 - b) $R = 3$
 - c) $R = \infty$
 - d) $R = \frac{1}{3}$
- 13) The function given by $f(x) = \begin{cases} \sin(1/x), & x \neq 0 \\ 0, & x = 0 \end{cases}$ is
- a) Unbounded everywhere

- b) Bounded and continuous everywhere
- c) Bounded but not continuous at $x = 0$
- d) Continuous and differentiable everywhere