

Section 2: Analytical and Quantitative Ability (36 Questions)

Q.37 Six people assembled in a room greet each other via handshakes. What is the total number of handshakes, assuming that every pair will shake hands exactly once?

- [A] 12 [B] 30 [C] 15 [D] 36

Q.38 Let x be a positive number such that the remainder of x modulo 7 is 3. Then the remainder of x^{152} modulo 7 is

- [A] 4 [B] 3 [C] 5 [D] 2

Q.39 Let $f(n) = n^{100}$ and $g(n) = 2^n$, where $n \geq 0$, be two functions. Then, which of the following is TRUE?

- [A] $f(n) \geq g(n)$, for all $n \geq 100$ [B] $g(n) \geq f(n)$, for all $n \geq 50$
[C] $g(n) \geq f(n)$, for all $n \geq 1000$ [D] $f(n) \geq g(n)$, for all $n \geq 1000$

Q.40 A merchant buys 100 items and pays for 80 items. He decides to offer 20% discount on the first 10 items sold, and 10% discount on the next 10 items sold, and no discount on the remaining items. What is the percentage of his profit?

- [A] 20.25 [B] 21.25 [C] 23.75 [D] 20.75

Q.41 Flipkart is selling a book worth Rs. 2000 at a discount of 15%. An additional discount of 5% on the currently discounted price is available if the purchase is made through a RuPay card. Any transaction with RuPay card is charged Rs. 50 per transaction by the bank. If the user chooses to buy the book using her RuPay card, the effective discount available to him/her is (in percentage):

- [A] 20 [B] 17.5 [C] 16.75 [D] 18

Q.42 Abel can do a piece of work in 30 days. Balu is 20% faster than Abel and is 20% slower than Cosmina. In how many days can Cosmina complete the piece of work?

- [A] 20 [B] 25 [C] 30 [D] 15

Q.43 The ratio between the amount of work done by Kala and Jameela is 2 : 3. Kala requires n days to complete a job. If they work together, in how many days they can complete the job?

- [A] $n/2$ [B] $0.66n$ [C] $0.4n$ [D] $n/3$

Q.44 In January 2005, a farmer takes a loan of Rs. 2 Lakhs at the rate of 10% compound interest, compounded annually at the beginning of every year. He manages to pay Rs. 50,000 at the end of every year. The number of years required for the farmer to completely pay off the loan is:

- [A] 4 [B] 6 [C] 7 [D] 8

Q.45 Rs. x was deposited at a bank with a simple interest of 10%. If the interest earned after 5 years is Rs. 50000, the value of x is:

- [A] 75,000 [B] 1,00,000 [C] 1,50,000 [D] 2,00,000

Q.46 Let p be a prime number. Suppose pn^3 is divisible by p^5 . Consider the following statements:

- I. p^3 divides n^3
- II. p^2 divides n
- III. p^9 does not divide n

Which of the following combinations is always TRUE?

- [A] II and III [B] I and II [C] I, II, and III [D] I and III

Q.47 The number of integer solutions to the equation $a + b = 100$ such that $|a|\sqrt{|a|} \leq 100$ is

- [A] 42 [B] 100 [C] 101 [D] 43

Q.48 Let m and n be numbers such that $a = \text{HCF}(m, n)$ and $b = \text{LCM}(m, n)$. Which of the following is FALSE?

- [A] $b = mn \div a$
- [B] $b < \max\{m^2, n^2\}$
- [C] There are integers α and β such that $\alpha m + \beta n = a$
- [D] $b > \min\{m^2, n^2\}$

Q.49 Suppose there is a committee of 10 people. In how many distinct ways can a chairman, a deputy chairman and a secretary be selected if no person can hold more than one position?

- [A] 10! [B] 1000 [C] 360 [D] 720

Q.50 There are six people in a room aged between 10 and 60 years. The average age of the people is 30 years. Suppose there are two teenagers among them. Consider the following statements:

- I. There is a person of age more than 35
- II. There are two people of age more than 30
- III. There cannot be more than two people aged above 50

Which of the following combinations of the above statements is always TRUE?

- [A] I and III [B] I and II [C] II and III [D] I, II and III

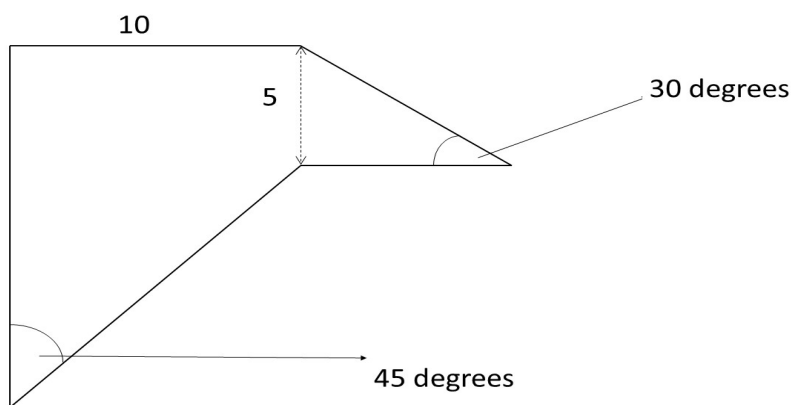
Q.51 Let a, b be two odd numbers such that $a > b$ and c be an even number such that $a, b, c \geq 5$. Which of the following numbers is odd?

- [A] $((a + 5)^2 - (b - 3)^2)(c - 1)^2$ [B] $((c - a)^3 + (a + b + 1)^2)(a - b)^2$
 [C] $((a + 2)^3 - (a + 1)^3)b^3 + c^3$ [D] $c^a + c^b$

Q.52 Suppose x and y are such that $2x + 5y$ is divisible by 13. Which of the following is always TRUE?

- [A] $2x^2 + 3xy - 5y^2$ is divisible by 13
 [B] $2x^2 + 9xy + 10y^2$ is not divisible by 13
 [C] $2x^2 + 5xy + 3$ is divisible by 13
 [D] $2(x + \beta) + 5(y + \alpha)$ is not divisible by 13 for any α and β

Q.53 The following picture shows a board that needs to be painted.



The distances are in meters and angles in degrees. Painting a square meter of the board area costs Rs 1000. What is the overall cost for painting the board?

- [A] Less than Rs. 1,00,985 [B] Approximately Rs. 1,21,650
 [C] More than Rs. 1,50,000 [D] Approximately Rs. 95,650

Q.54 A and B are standing on the x-y plane at co-ordinates (2,2) and (3,2) respectively. Suppose C is at a distance of 1 unit from A and the angle CAB is 30 degrees, which of the following is TRUE?

- [A] C is at a unit distance from B
- [B] The angle ACB is 90 degrees
- [C] C is in the same quadrant as A and B
- [D] Distance from B to C is less than that between A and C

Q.55 Suppose Goa is 400km to the south of Mumbai and Dharwad is 150km to the east of Goa. Mr. X who is presently at Mumbai, plans to drive to Goa. Ms. Y who is at Dharwad wants to drive to Mumbai via Goa, taking a break of two hours at Goa. If both X and Y start at the same time, and X drives at a speed of 40kmph and Y drives at a speed of 60kmph, how long does it take from the start for X and Y to cross each other?

- [A] 7 hours 30 minutes
- [B] 430 minutes
- [C] 6 hours 42 minutes
- [D] 6 hours 10 minutes

Q.56 We have a coin, which if tossed, shows up the head with probability $\frac{2}{5}$ and tail with probability $\frac{3}{5}$. If a sequence of five independent tosses of the coin is made, what is the probability that the number of times the head seen is exactly two?

- [A] $\frac{4}{25}$
- [B] $\frac{5}{16}$
- [C] $\frac{216}{265}$
- [D] $\frac{4}{5}$

Q.57 Suppose A, B, C, D and E are mutual friends and they have no other friends on Facebook. A sends a message to one of his friends chosen at random. The friend who received the messages chooses one of his friends at random and forwards the message. What is the probability that A receives his own message as a forwarded message?

- [A] $\frac{1}{8}$
- [B] $\frac{1}{16}$
- [C] $\frac{1}{4}$
- [D] $\frac{1}{2}$

Q.58 The ratio of A's salary to that of B's is 2 : 3. A's salary is incremented annually by 22.5% (compounded) and B's salary is incremented annually by 20% (compounded). Ratio of A's salary to that of B's after two years is:

- [A] 5 : 8
- [B] 2 : 3
- [C] 25 : 36
- [D] 5 : 6

Q.59 How many days are there in x years, x^2 weeks and x days, ignoring leap years?

- [A] $366x + 8x^2$
- [B] $366x + 7x^2$
- [C] $365x + 7x^2$
- [D] $365x + 7x^2 + 1$

Q.60 The next element in the sequence 2, 5, 11, 23, 47, ___ is:

- [A] 73
- [B] 91
- [C] 79
- [D] 97

A company exports two types of goods, type-A and type-B. The following table shows the exports in tons, tax paid and profit for the years 2009-2014. Answer Q.61 to Q.63 based on the following table:

Year	Exports type - A	Exports type - B	Tax paid (in lakhs)	Profit (in lakhs)
2009	100	50	5	50
2010	120	100	10	60
2011	200	200	50	100
2012	220	200	50	150
2013	300	250	70	200
2014	500	500	100	600

Q.61 What is the average amount of tax paid in lakhs?

- [A] 50 [B] 47.5 [C] 52.5 [D] 48.5

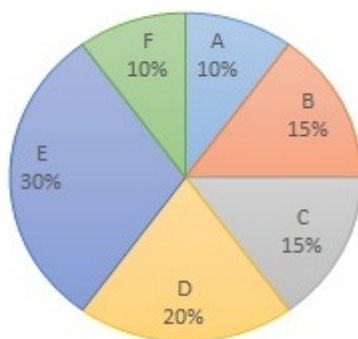
Q.62 Which of the following had the highest compounded average annual growth rate?

- [A] Export of type - A [B] Export of type - B
 [C] Tax paid [D] Profit earned

Q.63 Which year recorded the highest profit per unit of goods (both type – A and type – B) exported?

- [A] 2012 [B] 2014 [C] 2013 [D] 2009

The following pie chart shows the distribution of grades in a class of 200 students. Answer Q.64 to Q.66 based on the chart:



Q.64 How many students in the class have received grades B or C?

- [A] 30 [B] 60 [C] 90 [D] 120

Q.65 If A = 90 marks, B = 80 marks, C = 70 marks, D = 60 marks, E = 40 marks and F = 10 marks, what is the average marks in the class?

- [A] 61.5 [B] 51.5 [C] 59.5 [D] 56.5

Q.66 What is the central angle for the sector corresponding to grade B in the above chart?

- [A] $3\pi/5$ [B] $\pi/4$ [C] $3\pi/10$ [D] $10\pi/45$

Answer Q.67 and Q.68 based on the following sequence of logical statements:

If Shama goes to school today, then today is not a holiday.

Shama goes to school today.

If it is raining now, then today is a holiday.

If it is not raining now, then today will be a pleasant day.

Q.67 Which of the following is a valid conclusion?

- [A] Today is a holiday [B] Today will be a pleasant day
[C] It is raining now [D] None of the above

Q.68 Suppose in the above sequence of statements, the statement “Shama goes to school” is replaced by “Today will not be a pleasant day”, and the remaining statements are left as they are. Then, which of the following is a valid conclusion?

- [A] Today is not a holiday
[B] Shama does not go to school today
[C] It is raining now and Shama goes to school
[D] Shama does not go to school but it is not raining today

Answer Q.69 to Q.71 based on the following paragraph:

A datacenter has 7 employees named by letters A to G. A is the supervisor as well as a programmer. B reports to A and is a programmer. C and D report to B and are analysts. E reports to C as well as to D and is a programmer as well as an analyst. F works as a security consultant and reports to D. Finally, G is a programmer and reports to E.

Q.69 How many programmers work in the datacenter?

- [A] 2 [B] 3 [C] 6 [D] 4

Q.70 How many programmers directly or indirectly report to D?

- [A] 1 [B] 3 [C] 0 [D] 2

Q.71 Suppose that for any pair of employees x and y , if x reports directly to y , then y is older than x . Then, who is the second most elderly in the datacenter?

- [A] D [B] C [C] B [D] A

Q.72 Let A and B be two sets. Which of the following is always true?

- [A] $A - (A \cap B) = B - (B \cap A)$ [B] $A \cup B = A \cup (A \cap B)$
[C] $A = (A \cap B) \cup (A - B)$ [D] $A \cup B - A \cap B = A - B$