

**Solutions for ICET2010 [Exam held on 27th May 2010]
(According to Booklet Code : D)**

**Section – A
(1-75): Analytical Ability**

(1-20):

1. Statement I
No information about $\angle C$
I alone is not sufficient.
Statement II
No information about $\angle A$
II alone is not sufficient.
Combining both, the answer can be obtained.
Choice (3)
2. Statement I
 $A \cap B = \{1, 2, 3, 4, 5\}$
Set B can not be uniquely determined.
I alone is not sufficient.
Statement II
 $A - B = \{7, 8, 9, 10\}$
II alone is not sufficient.
Combining both, we can only say that B has at least five elements $\rightarrow 1, 2, 3, 4, 5$.
Also, B does not have the following elements 7, 8, 9, 10.
 \therefore combining both also we cannot answer the question.
Choice (4)
3. Statement I
 $|a| > b$
Let $a = 2, b = 1$
So, $|a| > b$
Also $a > b$
Let $a = -2, b = 1$
So, $|a| > b$
But $a < b$
I alone is not sufficient.
Statement II
 $|a| = b$
 $a = b$ or $a = -b$
'b' is always non negative.
In either case a is not greater than 'b'.
II alone is sufficient.
Choice (2)
4. From statement I, the given matrix is not invertable

$$\therefore \begin{vmatrix} \sin \theta & 0 & 0 \\ 2 & 2 & 0 \\ 3 & 4 & 1 \end{vmatrix} = 0$$

$$= \sin \theta (2 - 0) = 0 ; \Rightarrow \sin \theta = 0$$
 Statement I alone is sufficient.
Choice (1)
5. In the expression $15n^2 + 8n + 6$.
Let $p = \frac{15n^2 + 8n + 6}{n} = 15n + 8 + \frac{6}{n}$.
When n is factor of 6, p is natural number otherwise p is not natural number.
From statement I
n divides 10
n is a factor of 10.
 $n = 1, 2, 5, 10$
If $n = 1, 2$, then n divides 6.
 $n = 5, 10$ 'n' does not divide 6.
I alone is not sufficient.
Statement II
n divides 3!. That means n divides 6. Hence the given expression is divisible by 6. II alone is sufficient.
Choice (2)

6. Statement I:
 $a^2 + b^2 = 0$
'a' and 'b' are real numbers.
So, $a = 0, b = 0$
 $\Rightarrow a^3 + b^3 = 0$
I alone is sufficient.
Choice (1)
7. Statement I:
Let us take the following two cases.
Case (i):
 $x = -3$
 $y = 2$
So, $x^2 > y^2$
Case (ii):
 $x = -3$
 $y = 4$
So, $x^2 < y^2$
I alone is not sufficient.
Statement II is not sufficient since x and y are not given.
Combining I and II, we can say $x - y < 0$
 $\Rightarrow (x + y)(x - y) < 0$
[Since x, y are non negative real numbers, and $x + y > 0$]
So, $x^2 - y^2 < 0$.
Choice (3)
8. Statement I:
 $a = 10k_1 + 5$
 $a = 105, 115, 125, 135, 145, 155, \dots$
I alone is not sufficient.
Statement II:
 $a = 8k_2 + 3$
 $a = 107, 115, 123, 131, 139, 147, 155$.
II alone is not sufficient.
Combining both, there is no unique solution.
Choice (4)
9. Statement I:
 $\sin^2 \theta = 1$
 $\sin \theta = \pm 1$
 $\theta = \pi/2, -\pi/2$
I alone is not sufficient.
From statement II $\theta \in (0, \pi)$
II alone is not sufficient.
Combining I and II statements $\theta = \pi/2$.
Both I and II are together sufficient to answer the question.
Choice (3)
10. Statement I: The length of any of the sides is not given
I alone is not sufficient.
Statement II:
The height of the triangle is given. Area of the equilateral triangle is $\frac{h^2}{\sqrt{3}} = \frac{144}{\sqrt{3}}$
II alone is sufficient
Choice (2)
11. Statement I: $a^3 < 0$
So, $a < 0$
The real number is not positive.
I alone is sufficient.
Statement II:
 $a^2 - 5a + 6 < 0$
 $(a - 2)(a - 3) < 0$
 $2 < a < 3$
a is positive.
Thus, II alone is also sufficient. Choice (1) or (2)
Note: This question can be answered from I alone or II alone. Hence the answer choice can be either (1) or (2).

12. Statement I: It is not given whether the year is leap or non-leap year.
I alone is not sufficient.
Statement II: This is sufficient as 1st January, 2088 is taken as Monday. Choice (2)

13. let the length of rectangle be ' ℓ ' m and breadth be 'b' m.
Let the rate be Rs.K per metre.
Statement I:
 $Ib = 10,000$
The value of ℓ and b cannot be obtained.
Statement II:
Total cost = Rs.1,00,000 = $2(\ell + b)(K) = 1,00,000$
Combining I and II,
there are two equations and 3 unknowns, the answer cannot be obtained. Choice (4)

14. Statement I:
33886 is not divisible by 3.
If $a \geq 1$, 3^a will not divide 33886.
But given $3^a = 1$ divides 33886
 $\Rightarrow a$ must be = 0
I alone is sufficient. Choice (1)

15. Let P be the set of prime numbers.
Consider statement I. A is a subset of \mathbb{R}^+ .
A could be {2, 3} or {2, 3, 4} (among many other possibilities).
If $A = \{2, 3\}$, then $A \subseteq P$
If $A = \{2, 3, 4\}$, then $A \not\subseteq P$.
In the second case $A \not\subseteq P$.
Hence statement I is not sufficient.
Consider statement II
 $A \subseteq (-\infty, 0]$
If A is a non-empty subset of $(-\infty, 0]$, then $A \not\subseteq P$
If A is the null set, $A \subseteq P$.
 \therefore Statement II alone is not sufficient.
By combining the two statements, we can conclude that A is the null set.
 $\therefore A \subseteq P$. Choice (3)

16. Statement I
LCM (24, 30) = 120
If n is divisible by 24 and 30, it means n is divisible by 120.
however, it is not necessarily divisible by 720.
I alone is not sufficient.
Statement II
 $n = (a)(a+1)(a+2)(a+3)(a+4)(a+5)$
The product of 6 consecutive integers is always divisible by 6! or 720.
II alone is sufficient. Choice (2)

17. Statement I
No information about 'c' is given
I alone is not sufficient
Statement II
No information about 'a' is given. II alone is not sufficient.
Combining both, sufficient information about each of the three numbers is given so, $a : b : c$ can be obtained. Choice (3)

18. Statement I:
The initial or the final price of A is not given.
I alone is not sufficient.
Statement II:
The initial or the final price of B is not given.
II alone is not sufficient.
Combining both also we cannot answer since the initial and final prices of A and B are not known. Choice (4)

19. Statement I:
Any one of three numbers can be even,
I alone is not sufficient.
Statement II
Given $b + c = \text{odd}$

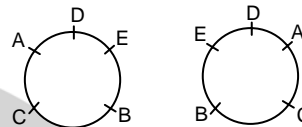
One of the numbers of b and c is even. That implies 'a' cannot be even, a must be odd.
II alone is sufficient. Choice (2)

20. Statement I
 $5a, 5b$ and $5c$ are in A.P.
If the numbers are divided by 5, the resultant numbers will be in A.P. ; $\Rightarrow a, b, c$ are in A.P.
I alone is sufficient. Choice (1)

(21-30):

21. The men and women can be arranged as follows.
 $W_1M_1 W_2M_2 W_3M_3 W_4M_4W_5$. The five women can be arranged in their respective positions in 5! ways. The four men can be arranged in their respective positions in 4! ways. \therefore The total number of arrangements = $5! \times 4! = 2880$.
Choice (3)

22. It is given that five persons – A, B, C, D and E are sitting around a circular table.
D is in-between A and E and C is in-between A and B.
From this information we get the following arrangements.



In both the cases, E is between B and D. Choice (4)

23. If the first day of a month is Sunday, then the first Saturday is on 7th.
 \therefore The second Saturday is on 14th.
Hence, the date of the Monday after the second Saturday is 16th. Choice (4)

24. The number of odd days from 1st January to 2nd March in a leap year.
Month: January + February + March
Odd days: $2 + 1 + 2$
Total number of odd days is five.
Five days to Tuesday is Sunday. Choice (1)

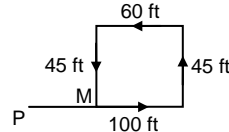
25. Given the present age of the daughter is 20 years. The age of daughter fifteen years ago is 5 years.
Given their ratio fifteen years ago is 6 : 1
 \therefore The age of the mother fifteen years ago is = 30 years.
 \therefore The present age of the mother is 45.
 \therefore The age of the mother after 5 years from now is $45 + 5 = 50$ years. Choice (3)

26. $x * y = 2x + y$
 $2 * a = 2(2) + a = 4 + a$
 $a * 3 = 2(a) + 3$
 \therefore Given $2 * a = a * 3$
 $4 + a = 2a + 3. \therefore a = 1$ Choice (3)

27. The least 3 digit number that leaves a remainder 5 when divided by 7 is 103. Greatest 3 digit number that leaves a remainder 5 when divided by 7 is 999.
The above series is in A.P with common difference 7, the first term 103 and the last term 999.
 $\therefore tn = a + (n - 1)d$
 $999 = 103 + (n - 1)7$
 $896 = (n - 1)7$
 $128 = n - 1. 129 = n$ Choice (3)

28. In 12 hours the two hands coincide for 11 times. Hence, in 24 hours they coincide for 22 times. Choice (1)

29. The path traversed by M is as follows.



Distance between M and P is $100 - 60 = 40$ ft.

Choice (4)

30. The man's wife's brother is the son of the women's only brother. Hence, the women's brother is the man's father-in-law. So, the person in the photograph is the sister of this man's father-in-law. Choice (4)
- (31-45):**
31. The given series is an alternate series
 1st letter: A⁺⁴, E⁺⁴, I⁺⁴, M⁺⁴, Q
 2nd letter: B⁺⁴, F⁺⁴, J⁺⁴, N⁺⁴, R
 3rd letter: D⁺⁴, H⁺⁴, L⁺⁴, P⁺⁴, T
 ∴ IJL is the missing term. Choice (3)
32. 99 : 120 :: _____ : 63
 $10^2 - 1 : 11^2 - 1 :: \text{_____} : 8^2 - 1$
 ∴ $7^2 - 1 = 48$ is the missing number. Choice (2)
33. The given letters are in the following pattern.
 T⁺³, W⁺³, Z⁺³, C⁺³, F⁺³, I
 ∴ F is the missing letter. Choice (3)
34. The given numbers can be expressed as follows.
 5, 10, 26, 50, 122, _____, 290, 362
 $2^2 + 1, 3^2 + 1, 5^2 + 1, 7^2 + 1, 11^2 + 1, 13^2 + 1, 17^2 + 1, 19^2 + 1$
 ∴ $13^2 + 1 = 170$ is the missing number. Choice (2)
35. The given numbers can be expressed as follows.
 $22\frac{2}{9}, 25, 28\frac{4}{7}, \text{_____}, 40$
 $\frac{200}{9}, \frac{200}{8}, \frac{200}{7}, \frac{200}{6}, \frac{200}{5}$
 ∴ $\frac{200}{6} = 33\frac{1}{3}$ is the missing number. Choice (1)
36. The given series is an alternate series
 1st number: 2⁺³, 5⁺⁵, 10⁺⁷, 17
 2nd number: 0⁺³, 3⁺⁵, 8⁺⁷, 15
 ∴ (17, 15) is the missing term. Choice (4)
37. The Given numbers can be expressed as follows.
 $4^0 + 3, 4^1 + 3, 4^2 + 3, 4^3 + 3, 4^4 + 3, 4^5 + 3$
 ∴ $4^4 + 3 = 259$ is the required number. Choice (3)
38. Numerators are in the following pattern,
 $3^{+5}, 8^{+7}, 15^{+9}, 24^{+11}, 35$
 The differences are consecutive odd numbers.
 Denominator is two more than the numerator.
 ∴ 15/17 is the missing term. Choice (4)
39. The given numbers are in the following pattern.
 $(2 + \sqrt{5}), (2 + \sqrt{5})^2, (2 + \sqrt{5})^3, (2 + \sqrt{5})^4, \text{_____}$
 ∴ $(2 + \sqrt{5})^5 = 38 + 17\sqrt{5}$ is the required number.
 Choice (2)
40. Each number can be expressed as $(2n + 1)^2$ when n is a prime number.
 25, 49, 121, 225, _____
 $(2 \times 2 + 1)^2, (2 \times 3 + 1)^2, (2 \times 5 + 1)^2, (2 \times 7 + 1)^2, (2 \times 11 + 1)^2$
 $(2 \times 11 + 1)^2 = 23^2 = 529$ is the missing number.
 Choice (3)
41. This question is a deviation from the regular analogy logic. This should be answered by applying principle of ratios:
 i.e., $\frac{1800}{1675} = \frac{3600}{x}$
 ∴ x = 3350 is the next number. Choice (3)
42. The given numbers are in the following pattern.
 $2^{-3}, -1^{+6}, 5^{-12}, -7^{+24}, 17^{+48}, -31$
 ∴ 17 is the missing number. Choice (4)
43. The given series is an alternate series
 1st letter: B⁺³, E⁺⁴, I⁺⁵, N
 2nd letter: A⁺³, D⁺⁴, H⁺⁵, M
 3rd letter: T⁺³, W⁺⁴, A⁺⁵, F
 ∴ NMF is the next term. Choice (4)
44. The given series is an alternate series
 1st letter: Y⁺¹⁰, I⁺¹⁰, S⁺¹⁰, C
 2nd letter: X⁺¹⁰, H⁺¹⁰, R⁺¹⁰, B
 3rd letter: D⁺¹⁰, N⁺¹⁰, X⁺¹⁰, H
 ∴ YXD is the missing letter. Choice (2)
45. 1st term: A B C
 logic -1 -2 -3
 2nd term: Z Y X
 Similarly, EFG : DCB
 ∴ DCB is the missing term. Choice (2)
- (46-55):**
46. Except 163, other numbers can be expressed in $n^2 - 1$ form.
 $80 = 9^2 - 1, 99 = 10^2 - 1$ and $120 = 11^2 - 1$. Choice (4)
47. Except Cinema hall, other places are related to travel. Choice (2)
48. Except in 2T1, in other terms the digits on either side of the letter makeup its place value.
 $V = 22, X = 24$ and $Z = 26$. $T = 20$ Choice (1)
49. Except mouth, all others are in pairs.
 OR
 Except hand all others are a part of the face.
 Here, the logic that eye, ear, mouth are a part of face is in accordance with the logic of odd man out, that out of the given items, except one all the other belong to a group. Hence choice (1) is the appropriate answer. Choice (1)
50. Except $x^2 - x - 12 = 0$, all others have complex roots. Choice (4)
51. Except T, all others belong to first half the English alphabet. Choice (4)
52. Except FLUTE, other are string instruments. Choice (4)
53. Except 72, all other numbers are product of two prime numbers.
 $35 = 5 \times 7, 46 = 2 \times 23, 72 = 8 \times 9$ and $91 = 7 \times 13$.
 OR
 Except 46, other numbers can be expressed as the some of the cubes of two numbers.
 $35 = 2^3 + 3^3, 72 = 2^3 + 4^3, 91 = 3^3 + 4^3$ but 46 cannot be expressed in
 Choice (2) or (3).
54. Except 216, other numbers can be expressed in $n^3 + 1$ form.
 $28 = 3^3 + 1, 65 = 4^3 + 1$ and $126 = 5^3 + 1$.
 $216 = 6^3$ Choice (4)
55. Except RTUS, others follow similar pattern
 $F^{+3} I^{-1} H^{-1} G, K^{+3} N^{-1} M^{-1} L, R^{+2} T^{-1} U^{-2} S, V^{+3} Y^{-1} X^{-1} W$
 Choice (3)
- (56-60):**
56. Given 2% of total cost = 10,000
 ∴ total cost = 5,00,000
 For a profit of 4%, the sales must be 5,20,000
 ∴ cost per book = $\frac{5,20,000}{13,000} = 40$ Choice (1)
57. Given 12% of total cost = 60,000
 If transportation charges are reduced by half, the total cost is reduced by 4%
 $4\% = \frac{60,000}{3} = 20,000$ Choice (4)
58. If the total cost is x,
 $30\% \text{ of } x - 24\% \text{ of } x = 30,000$
 ∴ 6% of x = 30,000
 Advertising charges = 18% of x = 90,000 Choice (4)
59. Angle for miscellaneous charges = $100 - (24 + 30 + 18 + 12 + 8 + 6) = 100 - 98 = 2\% = \frac{2}{100} \times 360 = 7^\circ 12'$
 Choice (3)

Section – B

(76-150): Mathematical Ability

60. Let the total cost be x.
6% of x + 8% of x = 70,000
14% of x = 70,000
 $\therefore x = \frac{100}{14} \times 70,000 = 5,00,000.$ Choice (2)

(61-65):

61. Total Number of dependents = $(40 \times 1) + (60 \times 2) + (35 \times 3) + (40 + 4) + (15 \times 5) + (10 \times 6)$
= $40 + 130 + 105 + 160 + 75 + 60 = 560.$ Choice (1)
62. Percentage of illiterate workers
= $\frac{95}{200} \times 100 = 47.5\%$ Choice (2)
63. Total number of workers = $40 + 60 + 35 + 40 + 15 + 10 = 200.$ Choice (2)
64. Number of literate workers = 105
Number of illiterate workers = 95
Required ratio = $105 : 95 = 21 : 19$ Choice (3)
65. The number of literate workers with at least 3 dependants = $15 + 20 + 5 + 5 = 45.$ Choice (4)

(66-70):

It is given that for the n^{th} letter in the English alphabet the code is $3n + 2$.
(mod 26) indicates that, in case $3n + 2$ is more than 26, the value obtained after subtracting 26 should be taken.
For $n = 1 = A$, its code is $3 \times 1 + 2 = 5 = E$,
 $n = 2 = B$, its code is $(3 \times 2) + 2 = 8 = H$,
 $n = 3 = C$, its code is $(3 \times 3) + 2 = 11 = K$
and so on.
Similarly, the codes for the remaining letters can be determined.

Letters: A B C D E F G H I J K L M
Codes: E H K N Q T W Z C F I L O

Letters: N O P Q R S T U V W X Y Z
Codes: R U X A D G J M P S V Y B

66. RADIO is coded as DENCU. Choice (1)
67. COMPUTER is coded as KUOXMJQD. Choice (2)
68. CKQJ is the code to the word ICET. Choice (4)
69. FULLY is coded as JOLLY. Choice (3)
70. STATE is coded as GJEJQ. Choice (2)

(71-75):

It is given that for vowels, their next vowels are given as their codes. For consonants their previous consonants, is are given as their codes.
The letters and their corresponding codes are as follows.

Letter: A B C D E F G H I J K L M
Code: E Z B C I D F G O H J K L

Letter: N O P Q R S T U V W X Y Z
Code: M U N P Q R S A T V W X Y

71. The code for ENERGY is IMIQFX. Choice (4)
72. The word RANGER is coded as QEMFIQ. Choice (2)
73. The code for CRICKET is BQOJBIS. Choice (3)
74. DISCOVER is coded as CORBUTIQ. Choice (4)
75. The code for EVEREST is ITIQIRS. Choice (1)

76. $9 \pmod{2} = 2k + 9 \Rightarrow x + 8 = 2k + 9.$
 $\Rightarrow x \in = 2k + 1.$
 \therefore The required set of numbers are odd numbers = $Z - 2Z.$ Choice (4)

77. Let the length and breadth of the rectangle be $2x, x$ respectively.
Area of the rectangle = $2x^2$
= 8^2 [same as that of square with side 8]
 $\Rightarrow x^2 = 32$
 $\Rightarrow x = \sqrt{32} = 4\sqrt{2}.$
Perimeter of rectangle = $2(l + b) = 2(2x + x) = 6x$
= $6 \times \sqrt{32} = 24\sqrt{2}.$ Choice (1)

78. $36000 = 2^5 \times 3^2 \times 5^3$
 \therefore Number of divisors = $(5 + 1)(2 + 1)(3 + 1)$
= $6 \times 3 \times 4 = 72$ Choice (2)

79. $\sqrt{47 - 4\sqrt{33}} = \sqrt{47 - 2\sqrt{132}} = \sqrt{44 + 3 - 2\sqrt{44} \times \sqrt{3}}$
= $\sqrt{(\sqrt{44})^2 + (\sqrt{3})^2 - 2\sqrt{44} \times \sqrt{3}}$
= $(\sqrt{44} - \sqrt{3})^2 = \sqrt{44} - \sqrt{3}.$ Choice (3)

80. Number of diagonals of an sided polygon = ${}^n C_2 - n$
 \therefore Required number of diagonals = ${}^{18} C_2 - 18$
= $\frac{18 \times 17}{2} - 18 = (17 \times 9) - 18 = 153 - 18 = 135.$ Choice (4)

81. The volume of a cylinder = $\pi r_c^2 h_c$ [r_c = radius, h_c = height]
The volume of cone = $\frac{1}{3} \pi r_i^2 h_i$ (r_i = radius, h_i = height).
The ratio of their volumes = $\pi r_c^2 h_c : \frac{1}{3} \pi r_i^2 h_i = 3 : 1$
[$\therefore r_c = r_i$ and $h_c = h_i$ (given)] Choice (2)

82. Total surface area of a cube = $6a^2 = 6(\text{side})^2$
= $6(5)^2 = 150$ sq. cm. Choice (3)

83. The required number should be of the form $8k + 3$.
The least 3 digit number of the required form = $8 \times 13 + 3 = 107.$ Choice (2)

84. Perimeter of a regular hexagon = $6 \times (\text{side})$
= $6(a) = 24$
 $\Rightarrow a = 4$ cm.
 \therefore Area of the regular hexagon = $6 \times \frac{\sqrt{3}}{4} \times a^2$
= $6 \times \frac{\sqrt{3}}{4} \times 4 \times 4 = 24\sqrt{3}.$ Choice (4)

85. Let the number of boys = b.
Number of girls = $70 - b$.
Total amount distributed = $b \times 30 + (70 - b) \times 35 = 2350.$
 $\Rightarrow 30b + (35 \times 70) - 35b = 2350.$
 $2450 - 2350 = 5b.$
 $100 = 5b. b = 20.$ Choice (4)

86. As the units digit of n^5 is always n, (when n is a natural number less than 9), the units digit of RHS is n.
 $\therefore b = n$

Alternative solution:

Given, $n^5 = 10a + b$, where a, b and n are from N.

We know that $n^5 - n$ is always divisible by 10.

$\therefore b = n$ Choice (2)

87. $\frac{8^{\frac{3}{4}} \times 9^{\frac{4}{3}}}{27^{\frac{2}{3}} \times 16^{\frac{3}{3}}} = \frac{2^{\frac{9}{4}} \times 3^{\frac{8}{3}}}{3^{\frac{9}{3}} \times 2^{\frac{8}{3}}} = 2^{\frac{9}{4} - \frac{8}{3}} \times 3^{\frac{8}{3} - \frac{9}{3}}$

$= 2^{-\frac{5}{12}} \times 3^{-\frac{11}{6}} = 2^a \times 3^b \dots (1)$

$\therefore a = -5/12, b = -11/6 \dots (2)$

$\therefore a - b = \frac{-5}{12} + \frac{11}{6} = \frac{17}{12}$ Choice (3)

Note : We concluded (2) from (1) as we assumed a and b as rational numbers.

88. $\frac{q}{p} = \frac{7}{10} \times \frac{5}{3} = \frac{7}{6}$

$\Rightarrow p : q = 6 : 7$ Choice (1)

89. $\left[\frac{(\sqrt{7} + \sqrt{5})^2 + (\sqrt{7} - \sqrt{5})^2}{(\sqrt{7})^2 - (\sqrt{5})^2} \right]^3$

$= \left[\frac{2((\sqrt{7})^2 + (\sqrt{5})^2)}{7 - 5} \right]^3 = \left(\frac{24}{2} \right)^3 = 12^3 = 1728$

Choice (1)

90. $16^{\frac{3}{4}} - 8^{\frac{1}{3}} + 49^{\frac{1}{2}}$

$= (2^4)^{\frac{3}{4}} - (2^3)^{\frac{1}{3}} + (7^2)^{\frac{1}{2}} = 2^3 - 2^1 + 7^1 = 13$

Choice (2)

91. $\frac{ab^{\frac{1}{2}} - a^{\frac{1}{2}}b}{\frac{1}{a^2} - \frac{1}{b^2}} = \frac{a^{\frac{1}{2}}b^{\frac{1}{2}}[a^{\frac{1}{2}} - b^{\frac{1}{2}}]}{\frac{1}{a^2} - \frac{1}{b^2}} = \frac{a^{\frac{1}{2}}b^{\frac{1}{2}}}{a^2 - b^2} = (ab)^{\frac{1}{2}} = \sqrt{ab}$

Choice (3)

92. $(3^4)^x = (3^{-5})^y$

$\Rightarrow 4x = -5y$

$\Rightarrow 4$

Choice (4)

93. $\frac{54}{n^3} = \frac{2 \times 3^3}{n^3}$

\therefore for the number to be even the least value is n should be -3 Choice (3)

94. Given that $\frac{1}{A} + \frac{1}{B} = \frac{1}{12} \dots (1)$

$\frac{1}{B} + \frac{1}{C} = \frac{1}{15} \dots (2)$ and $\frac{1}{C} + \frac{1}{A} = \frac{1}{20}$

$(1) + (2) + (3) \Rightarrow 2 \left[\frac{1}{A} + \frac{1}{B} + \frac{1}{C} \right] = \frac{1}{12} + \frac{1}{15} + \frac{1}{20}$

$\Rightarrow \frac{1}{A} + \frac{1}{B} + \frac{1}{C} = \left[\frac{5+4+3}{60} \right] \frac{1}{2}$

$\therefore \frac{1}{A} + \frac{1}{B} + \frac{1}{C} = \frac{1}{10}$

\therefore A, B and C can complete the work in 10 days

Choice (4)

95. 25% of CP - 20% of CP = 35 \Rightarrow 5% of CP = 35.

The total price of the article is Rs.700. Choice (2)

96. Ratio of the profits of X, Y and Z is (6000 x 2) : (7000 x 4) : (6400 x 5)

$= 60 \times 2 : 70 \times 4 : 64 \times 5 = 120 : 280 : 320 = 3 : 7 : 8$

\therefore Share of X = $\frac{3}{3+7+8} \times 900 = \frac{3}{18} \times 900 = \text{Rs.150}$

Choice (2)

97. Speed of the train = $\frac{L_t + L_b}{\text{time}}$ where L_t is the length of the

train (say x m) and L_b is the length of the bridge (given as 150 m)

$\Rightarrow 90 \times \frac{5}{18} = \frac{x+150}{20}$

$500 - 150 = x ; \Rightarrow x = 350$ Choice (1)

98. The difference between the remainders and the divisors is constant i.e. 11

\therefore Required number will be of the form

$K \times \text{LCM}(36, 48, 64) - 11$

$= K \times \text{LCM}(3^2 \times 2^2, 3 \times 2^4, 2^6) - 11$

$K(3^2 \times 2^6) - 11 = 576k - 11$

\therefore The least positive integer = $1 \times 576 - 11 = 565$

Choice (4)

99. $\text{Rem} \left(\frac{2^{13416}}{5} \right)$ is equivalent to $\text{Rem} \left(\frac{2^4}{5} \right) = 1$

Choice (4)

100. Given $P \left(1 + \frac{R}{100} \right)^4 = 4P$

$\Rightarrow \left(1 + \frac{R}{100} \right) = 4^{\frac{1}{4}}$

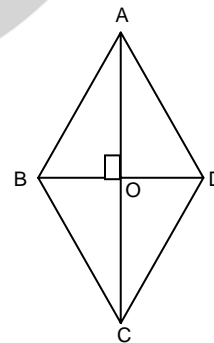
Let $\left(1 + \frac{R}{100} \right)^n = 64$

$\Rightarrow \left(4^{\frac{1}{4}} \right)^n = 64 = 4^3 = \frac{n}{4} = 3$

$\Rightarrow n = 12$

Choice (4)

101. The perimeter of the rhombus = 100 cm.



The side of the rhombus = $\frac{100}{4} = 25$ cm

Let AB = 25 cm

Let AC = 40 cm ; $\Rightarrow AO = \frac{40}{2} = 20$ cm

$BO = \sqrt{AB^2 - AO^2} = \sqrt{25^2 - 20^2} = \sqrt{15^2} = 15$ cm

$\Rightarrow BD = 2(BO) = 30$ cm

Area of the rhombus = $\frac{AC \times BD}{2} = \frac{40 \times 30}{2} = 600$ sq cm.

Choice (3)

102. $\frac{3}{7}$ of the cistern is filled in 6 hours, so the cistern is filled in $\frac{7}{3} \times 6 = 14$ hours. Choice (1)

103. In 5 minutes the part of the tank filled is

$$5 \left(\frac{1}{20} + \frac{1}{25} \right) = 5 \left(\frac{9}{100} \right) = \frac{9}{20}$$

Remaining, $1 - \frac{9}{20} = \frac{11}{20}$ of the tank is filled by the first tap. This tap can fill the complete cistern in 20 minutes and so, $\frac{11}{20}$ can of the cistern is filled in $\frac{11}{20} \times 20$ i.e. 11 minutes. Choice (2)

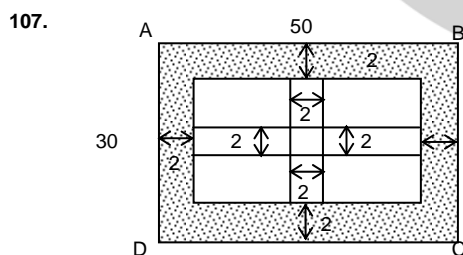
104. Given numbers are
 $a = 1152$ and $b = 1664$
 HCF (a, b) = 128
 $\therefore \text{LCM} = \frac{a \times b}{\text{HCF}}$
 $= \frac{1152 \times 1664}{128} = 14976$ Choice (3)

105. Given, the height of cone (h) = 84 cm and the area of base = 3850 sq. cm
 $\Rightarrow \pi r^2 = 3850$;
 $\Rightarrow \frac{22}{7} r^2 = 3850$;
 $\Rightarrow r^2 = 1225$
 $\Rightarrow r = 35$ cm

The slant of the cone (ℓ) = $\sqrt{h^2 + r^2} = 91$ cm

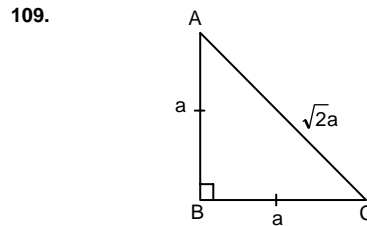
The CSA of the cone = $\pi r \ell = \frac{22}{7} \times 35 \times 91 = 10010$ sq cm. Choice (3)

106. Given that the ratio of weights of three solid spheres = 8 : 27 : 64
 The weight and volume of spheres are in direct variation.
 \therefore The ratio volumes of the spheres = 8 : 27 : 64
 $\Rightarrow r_1^3, r_2^3, r_3^3 = 8 : 27 : 64$
 $\Rightarrow r_1 : r_2 : r_3 = 2 : 3 : 4$
 $\Rightarrow 2r_1 : 2r_2 : 2r_3 = 4 : 6 : 8$ Choice (4)



Given that the dimensions of the plot are 50m x 30m
 The width of the plot is given as 2 m. From the figure the required area = $(50 \times 30 - (50-4)(30-4)) + ((50-4)(2) + (30-4)2 - 2 \times 2)$
 $= 1500 - 1196 + 92 + 52 - 4 = 444$ sq m. Choice (1)

108. Given that the parallel sides of trapezium are a = 20m and b = 35 m.
 The distance between parallel sides (h) = 8m.
 Area of trapezium
 $= \frac{h}{2}(a+b) = \frac{8}{2}(20+35) = 220$ sq m. Choice (2)



109. Given that $\frac{a^2}{2} = 4.5$
 $\Rightarrow a^2 = 9$
 $\Rightarrow a = 3$
 The perimeter of right isosceles triangle = $2a + \sqrt{2}a$
 $= 2(3) + \sqrt{2}(3) = (6 + 3\sqrt{2})$ m. Choice (1)

110. Let R and r be the outer and inner radii of the ground.
 Given that
 $2\pi(R-r) = 66$; $\Rightarrow 2 \times \frac{22}{7} (R-r) = 66$
 $\Rightarrow R-r = 10.5$ m
 \therefore width of the road = $R-r = 10.5$ m. Choice (2)

111. Using L. Hospitals rule
 $\lim_{x \rightarrow 0} \frac{7 \cos \theta - \cos \theta}{10 \cos 10\theta - 7 \cos 7\theta} = \frac{7-1}{10-7} = \frac{6}{3} = 2$ Choice (1)

112. Let T_{r+1} contain the coefficient of x in $\left(x^p + \frac{1}{x^q}\right)$. Then
 $r = \frac{np-k}{p+q}$ here $n=4, p=1, q=2, k=-2$
 $r = \frac{4 \times 1 - (-2)}{2+1} = 2$
 \therefore Third term contains the coefficient of x^{-2}
 \therefore required coefficient ($T_3 = T_{2+1} = {}^4C_2(-3)^2(2)^2 = 216$) Choice (3)

113. $\frac{d}{dx} \left(\frac{\log 10}{\log x} \right) = \log 10 \frac{d}{dx} (\log x) = \frac{-\log 10}{(\log x)^2} \frac{d}{dx} (\log x)$
 $= \frac{-\log 10}{x(\log x)^2}$ Choice (2)

114. $\lim_{x \rightarrow 5} \frac{(x+1)^2(x-5)^2}{|x-5|}$
 $\lim_{x \rightarrow 5} \frac{(x+1)^2(x-5)^2}{-(x-5)} = 0$ and $\lim_{x \rightarrow 5^+} \frac{(x+1)^2(x-5)^2}{(x-5)} = 0$
 $\lim_{x \rightarrow 5} \frac{(x^2-4x-5)^2}{|x-5|} = 0$ Choice (3)

115. When f(x) is divided by $x-a$, the remainder is f(a)
 Required remainder $f(3) = 3^3 - 2(3)^2 - 3 = 27 - 18 - 3 = 6$ Choice (4)

116. $\begin{vmatrix} 4a & 4b \\ 3c & 3d \end{vmatrix} = 12ad - 12bc = 12(ad - bc) = 12|A|$
 $= 12 \times 5 = 60$ Choice (4)

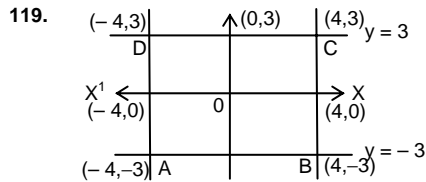
117. $\lim_{x \rightarrow 0} \frac{\sqrt{4+x} - \sqrt{4-x}}{x} \times \frac{\sqrt{4+x} + \sqrt{4-x}}{\sqrt{4-x} + \sqrt{4+x}}$
 $\lim_{x \rightarrow 0} \frac{4+x-4+x}{x(\sqrt{4-x} + \sqrt{4-x})}$

$$= \lim_{x \rightarrow 0} \frac{2x}{x(\sqrt{4-x} + \sqrt{4+x})}$$

$$= \frac{2}{4} = \frac{1}{2}$$

Choice (2)

118. $\tan(85^\circ + 50^\circ) = \frac{\tan 85^\circ + \tan 50^\circ}{1 - \tan 85^\circ \tan 50^\circ} = -1$
 $\Rightarrow \tan 80^\circ \tan 50^\circ - \tan 85^\circ - \tan 50^\circ = 1$ Choice (1)



AB = 8 units
 BC = 6 units.
 Area of ABCD = AB × BC = 48 sq units.

Choice (2)

120. $f(x) = \frac{1}{\sqrt{x}} = x^{-\frac{1}{2}}$

$$f'(x) = -\frac{1}{2} \cdot x^{-\frac{1}{2}-1} = -\frac{1}{2} x^{-\frac{3}{2}}$$

$$f'(4) = -\frac{1}{2} (4)^{-3/2} = -\frac{1}{2} \cdot \frac{1}{8} = -\frac{1}{16}$$

Choice (1)

121. We know that harmonic mean of a, b is $\frac{2ab}{a+b}$.

$$\therefore \text{The harmonic mean of 15 and 10 is} = \frac{300}{25} = 12$$

Choice (4)

122. $f(x) = 2^{\cot x} \Rightarrow f'(x) = 2^{\cot x} \cdot \log 2 \frac{d}{dx}(\cot x)$

$$\therefore 2^{\cot x} \log 2 \cdot (-\operatorname{cosec}^2 x)$$

$$f'(\pi/4) = 2 \cdot \log 2 \cdot (-2) = -4 \log 2$$

Choice (2)

123. Required number of subsets of A = total subsets of A - subset which contain 5 elements = $2^5 - 1 = 31$

Choice (1)

124. $\cos \theta = \frac{-12}{13}$

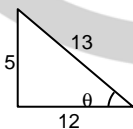
Since $\theta \notin Q_3$ and $\cos \theta$ is negative

$$\therefore \theta \in Q_2 \Rightarrow \sin \theta = \frac{5}{13} \text{ and } \tan \theta = \frac{-5}{12}$$

$$\sin \theta + \tan \theta = \frac{5}{13} + \frac{-5}{12}$$

$$= 5 \left(\frac{12-13}{156} \right) = \frac{-5}{156}$$

Choice (4)



125. $x^2 + x + 1 = 0$

The roots of the above question are ω, ω^2 where ω is the complex cube root of unity. Let $\alpha = \omega, \beta = \omega^2$
 $\alpha^{28} - \beta^{56} = (\omega^2)^{28} - \omega^{56} = 0$. Choice (4)

126. Given $A_n =$ Set of all positive integral divisions of n.
 $A_{18} = \{1, 2, 3, 6, 9, 18\}$ and $A_{24} = \{1, 2, 3, 4, 6, 8, 12, 24\}$
 $A_{18} \cap A_{24} = \{1, 2, 3, 6\}$
 $\therefore n(A_{18} \cap A_{24}) = 4$ Choice (1)

127. We know that the number of bijections from A to A when A has n elements is n!
 Here n = 5
 \therefore Required number of bijections = 5! Choice (3)

128. We know $3^1 = 3, 3^2 = 9, 3^3 = 27, 3^4 = 81$
 $3^{741} = (3^4)^{185} \cdot 3$

The unit of $(3^4)^{185}$ is 1.

\therefore hence the unit digit of 3^{741} is 3

Choice (1)

129. $A - (B \cap C) = (A - B) \cup (A - C)$
 (standard result) Choice (3)

130. Consider second option

p	q	$p \wedge q$	$(p \wedge q) \rightarrow p$
T	T	T	T
T	F	F	T
F	T	F	T
F	F	F	T

$\therefore (p \wedge q) \rightarrow p$ is tautology.

Choice (2)

131. $\sin 75^\circ = \sin(45^\circ + 30^\circ) = \sin 45^\circ \cos 30^\circ + \cos 45^\circ \sin 30^\circ$

$$= \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{3}}{2} + \frac{1}{\sqrt{2}} \cdot \frac{1}{2} = \frac{\sqrt{3} + 1}{2\sqrt{2}}$$

Choice (4)

132. The minimum value of $a \cos x + b \sin x + c$ is $c - \sqrt{a^2 + b^2}$

\therefore The minimum value of $7 - 5 \cos x - 12 \sin x$ is

$$7 - \sqrt{5^2 + 12^2} = -6$$

Choice (3)

133. $\sec \theta - \tan \theta = 5$ (1)

$$\Rightarrow \sec \theta + \tan \theta = \frac{1}{5}$$
 (2)

$$\text{Solving (1) and (2)} \Rightarrow \sec \theta = \frac{13}{5} \text{ and } \tan \theta = \frac{-12}{5}$$

$$\sin \theta = \frac{\tan \theta}{\sec \theta} = \frac{-12}{13}$$

Choice (3)

134. $\frac{\sin \theta}{\sec \theta - 1} - \frac{\sin \theta}{\sec \theta + 1} = \frac{\sin \theta (\sec \theta + 1) - \sin \theta (\sec \theta - 1)}{(\sec \theta - 1)(\sec \theta + 1)}$

$$\sin \theta \left[\frac{\sec \theta + 1 - \sec \theta + 1}{\sec^2 \theta - 1} \right] = \sin \theta \frac{2}{\tan^2 \theta}$$

$$= 2 \cot^2 \theta \sin \theta = 2 \cot \theta \cos \theta$$

Choice (1)

135. The equation of a straight line in intercept form is

$$\frac{x}{a} + \frac{y}{b} = 1$$

Here $a = 1/5; b = 1/7$

$$\text{The required equation of the line is } \frac{x}{1/5} + \frac{y}{1/7} = 1$$

$$\Rightarrow 5x + 7y = 1$$

Choice (2)

136. The perpendicular distance from (x_1, y_1) to $ax + by + c = 0$ is $\frac{|ax_1 + by_1 + c|}{\sqrt{a^2 + b^2}}$.

$$\text{The required distance} = \frac{|3(2) + 4(-3) - 4|}{\sqrt{3^2 + 4^2}}$$

$$= \frac{|6 - 12 - 4|}{\sqrt{25}} = 2 \text{ units}$$

Choice (2)

137. Equation of the line passing through $(4, -5)$ and $(5, 1)$ is

$$y + 5 = \frac{1 - (-5)}{5 - 4} (x - 4)$$

$$y + 5 = 6(x - 4); \Rightarrow 6x - y - 29 = 0$$

$$x - \text{intercept} = \frac{29}{6}$$

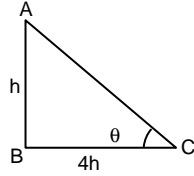
Choice (1)

138. Let AB be the height of tower and BC, the length of shadow of tower.

$$\text{In } \triangle ABC \tan \theta = \frac{AB}{BC}$$

$$\tan \theta = \frac{h}{4h}$$

$$\theta = \tan^{-1} \left(\frac{1}{4} \right)$$



Choice (4)

139. Given $A = \begin{bmatrix} 3 & -1 \\ 0 & 5 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 1 \\ 4 & -1 \end{bmatrix}$

$$2A = \begin{bmatrix} 6 & -2 \\ 0 & 10 \end{bmatrix} \quad 3B = \begin{bmatrix} 6 & 3 \\ 12 & -3 \end{bmatrix}$$

$$2A + 3B = \begin{bmatrix} 6+6 & -2+3 \\ 0+12 & 10-3 \end{bmatrix}$$

$$2A + 3B = \begin{bmatrix} 12 & 1 \\ 12 & 7 \end{bmatrix}$$

$$|2A + 3B| = \begin{vmatrix} 12 & 1 \\ 12 & 7 \end{vmatrix} = 84 - 12 = 72 \quad \text{Choice (2)}$$

140. $A = \begin{bmatrix} \cos \theta & \sin \theta \\ \sin \theta & -\cos \theta \end{bmatrix}$

$$\det A = -\cos^2 \theta - \sin^2 \theta = -(\cos^2 \theta + \sin^2 \theta) = -1$$

$$\text{If } A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}, \text{ then } A^{-1} = \frac{1}{\det A} \begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$$

$$= -1 \begin{bmatrix} -\cos \theta & -\sin \theta \\ -\sin \theta & \cos \theta \end{bmatrix} = \begin{bmatrix} \cos \theta & \sin \theta \\ \sin \theta & -\cos \theta \end{bmatrix}$$

Choice (2)

141. We know that when n coins are tossed, the probability of

$$\text{getting exactly } r \text{ heads} = \frac{{}^n C_r}{2^n}$$

$$\text{Here } n = 3, r = 1$$

$$\therefore \text{Required probability} = \frac{{}^3 C_1}{2^3} = \frac{3}{8} \quad \text{Choice (2)}$$

142. Arranging the given observations in increasing order we get.

1, 1, 2, 3, 4, 4, 5, 6, 7, 7, 8, 8, 9

We know that middle observation is median = 5

Choice (3)

143. Sum of observations $1^2, 2^2, \dots, 15^2 = 1^2 + 2^2 + \dots + 15^2 = \frac{15(15+1)(2 \cdot 15 + 1)}{6} = 1240$

$$\text{Mean of the given observations} = \frac{\text{sum}}{\text{total observations}}$$

$$= \frac{1240}{15} = \frac{248}{3} \quad \text{Choice (1)}$$

144. The given observations are in A.P. with common difference 5

$$\therefore \text{S.D} = cd \sqrt{\frac{n^2 - 1}{12}} \quad (cd = \text{common difference})$$

$$\text{Here } n = 7; cd = 5$$

$$\therefore \text{S.D} = 5 \sqrt{\frac{49 - 1}{12}} = 10 \quad \text{Choice (4)}$$

145. Total number of 3 digit numbers that can be formed using the digits 0, 1, 2, 3, 4 is $\begin{bmatrix} \square & \square & \square \end{bmatrix}$
 $4 \times 4 \times 3 = 48$

$$n(s) = 48$$

If a number ends with an even digit then it is divisible by 2

Consider 3 blanks - - -

If units place is filled with '0', then the other two places can be filled in $4 \times 3 = 12$ ways

If units place is filled with 2 or 4 the remaining two places can be filled in 3×3 (\because first place never be zero) ways

Total ways = $3 \times 3 \times 2 = 18$

Favourable cases ie ending with 0 or 2 or 4 = $18 + 12 = 30$

Required probability = $30/48 = 5/8$ Choice (4)

146. We know that Mode = 3 Median - 2 Mean

$$16 = 3 \times 12 - 2 \text{ Mean}; \Rightarrow \text{Mean} = \frac{36 - 16}{2} = 10$$

Choice (3)

147. We know that if the AM of n_1 observations is x_1 and n_2 observations x_2 , then the AM of total observations is $\frac{n_1 x_1 + n_2 x_2}{n_1 + n_2}$

$$\text{Here } n_1 = 24; n_2 = 16; x_1 = 10, x_2 = 15$$

$$\therefore \text{required combined mean} = \frac{24 \times 10 + 16 \times 15}{24 + 16} = \frac{480}{40}$$

$$= 12.$$

Choice (2)

148. When two dice are rolled, $n(s) = 6^2$

Favourable cases for the sum to be 7 are (1, 6), (2, 5), (3, 4), (4, 3), (5, 2), (6, 1) i.e 6

$$\therefore \text{The required probability} = \frac{6}{6^2} = \frac{1}{6} \quad \text{Choice (2)}$$

149. Here $n(s) = 90$

The number of numbers less than 90 which are divisible by 4 is $22 = n(A)$

The number of numbers less than 90 which are divisible by 6 is $15 = n(B)$

The number of numbers less than 90 which are divisible by both 4 and 6 i.e divisible by 12, is 7.

$$P(A \cup B) = P(A) + P(B) - P(A \cap B) = \frac{22}{90} + \frac{15}{90} - \frac{7}{90}$$

$$\therefore \text{Required probability} = \frac{22 + 15 - 7}{90} = \frac{30}{90} = \frac{1}{3}$$

Choice (3)

150. A leap year contains 366 days. There are 52 full weeks and an extra of two days.

The following are the possibilities for the two days (Mon, Tues), (Tues, Wed), (Wed, Thur), (Thur, Fri), (Fri, Sat), (Sat, Sun), (Sun, Mon), which are 7.

Favourable cases for the leap year to have 53 Thursdays are (Wed, Thur), (Thur, Fri) are 2

$$\therefore \text{The required probability} = 2/7 \quad \text{Choice (2)}$$

Section - C

(151-200): Communication Ability

151. Refer to the first lines of para 1 and 2. Choice (1)
152. Refer to lines 5-6 of para 2. 'They are made as much by what we think as by what we see'. Choice (1)
153. 'Without' is also the opposite of 'within'. The stimuli (agent that affects the living organism) comes from the out side environment, that is, without. Choice (2)
154. Refer to lines 5-6 of para 2. So the image is modified by what we think. Choice (1)
155. Refer to the penultimate sentence '... The mind projects its ideas of things on the screen of what we call memory.....' Choice (1)
156. Since the para talks mainly about recycling of paper even if only as an element in the making of paper and since there is hardly a difference between paper "production" and "manufacture" the appropriate title for the passage would be paper recycling. Choice (2)
157. Refer to line 1. Choice (3)

158. Refer to lines 4-6. Choice (4)
159. Refer to the third line from the end of the passage – ‘.... The paper industry has Utilization of used fibre’. Choice (1)
160. Choices 1, 3 and 4 are mentioned in lines 4 and 3 from the end of the para. Choice (2)
161. Refer to line 2 – unclear speech is usually due to unclear thought’. Which means that it may not be due to unclear thought (confused thinking) also. Choice (2)
162. The passage says some people fail to impress the audience because ‘they are nervous in public’, that is, they are overpowered by fear. Choice (3)
163. Refer to line 5. Choice (3)
164. The passage says the audience may be annoyed by difficult words (they cannot understand). He says the construction of the sentence should be simple. Choice (3)
165. Refer to the last line ‘.... leave the hall’. Choice (4)
166. Rapture means great happiness or ecstasy. Choice (2)
167. To downsize is to reduce the scale of operations. Choice (4)
168. Visage means the face or countenance. Choice (2)
169. Equanimity means to be balanced or composure. Choice (4)
170. To apprehend is to arrest. Choice (3)
171. To optimize is to make the best use of resources or what you have. Choice (3)
172. A tornado ‘strikes’ a place. Choice (2)
173. The message ‘saddened’ her, so she broke down (cried). Choice (1)
174. ‘Trespassers will be prosecuted’ is the common notice. Choice (2)
175. To daunt is to frighten. Choice (2)
176. Choice (2)
177. Choice (2)
178. Choice (2)
179. Choice (1)
180. Choice (3)
181. Choice (3)
182. Choice (4)
183. Choice (1)
184. Choice (2)
185. Choice (1)
186. The speaker says, ‘I never said that at all’. Hence, ‘I beg your pardon’ is used to convey his disagreement. Choice (1)
187. When B says, ‘I had no choice’, he means that he dropped the person home because he had to, not because he wanted to. So the words show his resentment (annoyance or indignation). Choice (3)
188. The words used are decisive, in the nature of an order; hence command. Choice (1)
189. The idiom ‘to raise a hue and cry’ means to make a big show to draw attention, hence clamour. Choice (2)
190. To burn your fingers means to be hurt by your own actions. Choice (3)
191. To ‘make a clean breast of’ means to confess fully. Choice (3)
192. To build castles in the air means to day-dream. Choice (3)
193. To stick to means to confine yourself to. Choice (2)
194. ‘Will the seminar come off? is right. To come off means to be successful. Choice (1)
195. Only ‘rose’ can fit since the other three imply done by somebody else. Choice (4)
196. Only ‘laid’ is right—the past tense of lay. Choice (2)
197. The right word is ‘flowed’ (Flow – flowed – flowed) since flown is the past participle of fly (fly – flew – flown). The blank takes ‘has flowed’. Choice (4)
198. You take ‘into’ custody. ‘Into’ suggests movement. Choice (1)
199. Something is done ‘in’ a period of time. Choice (3)
200. You jump ‘to’ conclusions. Choice (2)