Date Planned : __ / __ / __	Daily Tutorial Sheet - 7	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level - 2	Exact Duration :_________

141. Let $E = \left[\frac{1}{3} + \frac{1}{50}\right] + \left[\frac{1}{3} + \frac{2}{50}\right] + ... +$ up to 50 terms, then exponent of 2 in $(E)!$ is:

(A) 13 **(B)** 15 **(C)** 17 **(D)** 19

***142.** The number of ways in which we can choose 2 distinct integers from 1 to 100 such that difference between them is at most 10 is:

(A) ${}^{40}C_2$ **(B)** ${}^{70}C_2$ **(C)** ${}^{100}C_2 - {}^{90}C_2$ **(D)** 945

143. Let S = {1, 2, 3, 4}. The total number of unordered pairs of disjoint subsets of *S* is equal to:

(A) 25 **(B)** 34 **(C)** 42 **(D)** 41

144. If *r*, *s*, *t* are prime numbers and *p*, *q* are natural numbers such that *LCM* of *p*, *q* is $r^2 s^4 t^2$, then the number of ordered pairs (*p*, *q*) is:

(A) 252 **(B)** 254 **(C)** 225 **(D)** 224

145. If $x, y \in (0, 30)$ such that $\left[\frac{x}{3}\right] + \left[\frac{3x}{2}\right] + \left[\frac{y}{2}\right] + \left[\frac{3y}{4}\right] = \frac{11}{6}x + \frac{5}{4}y$ (where [*x*] denotes greatest integer $\le x$), then number of ordered pairs (*x*, *y*) is:

(A) 0 **(B)** 2 **(C)** 4 **(D)** None of these

146. The number of positive integral solutions of the equation $x_1 x_2 x_3 x_4 x_5 = 1050$ is:

(A) 1800 **(B)** 1600 **(C)** 1400 **(D)** None of these

***147.** Consider all 3 element subsets of the set {1, 2, 3, ... 300} then:

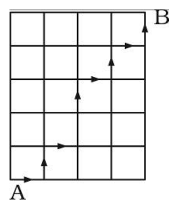
(A) Number of these subsets for which Sum of the three elements is multiple of 3 is $3 \times {}^{100}C_3 + 100^3$

(B) Number of these subsets for which sum of the three elements is not a multiple of 3 is $300^3 - 3 \times {}^{100}C_3 - 100^3$

(C) Number of these subsets for which sum of the three elements is even is ${}^{151}C_3 + 149 \times {}^{150}C_2$

(D) Number of these subsets for which sum of the three elements is even is ${}^{300}C_3 - {}^{150}C_3$

148. A person is to walk from A to B. However, he is restricted to walk only to the right of A or upwards of A. but not necessarily in the order shown in the figure. Then find the number of paths from A to B.



(A) 124 **(B)** 126
(C) 122 **(D)** 120

149. There are 2 identical white balls, 3 identical red balls and 4 green balls of different shades. The number of ways in which they can be arranged in a row so that atleast one ball is separated from the balls of the same colour, is:

(A) $6(7! - 4!)$ **(B)** $7(6! - 4!)$ **(C)** $8! - 5!$ **(D)** None of these

150. There are six letters $L_1, L_2, L_3, L_4, L_5, L_6$ and their corresponding six envelopes $E_1, E_2, E_3, E_4, E_5, E_6$. Letters having odd value can be put into odd valued envelopes and even valued letters can be put into even valued envelopes, so that no letter goes into the right envelopes, then number of arrangements equals.

(A) 6 **(B)** 9 **(C)** 44 **(D)** 4

151. The streets of a city are arranged like the lines of a chess board. There are '*m*' streets running North to South and '*n*' streets running East to West. The number of ways in which a man can travel from NW to SE corner going the shortest possible distance is:

(A) $\sqrt{m^2+n^2}$ **(B)** $\sqrt{(m-1)^2 \cdot (n-1)^2}$ **(C)** $\dfrac{(m+n)!}{m! \cdot n!}$ **(D)** $\dfrac{(m+n-2)!}{(m-1)! \cdot (n-1)!}$

Match the Column.

152.

Column-I		Column-II	
(A)	The total numbers of selections of fruits which can be made from 3 bananas, 4 apples and 2 oranges is, it is given that fruits of one kind are identical	**(p)**	120
(B)	There are 10 true-false statements in a question paper. How many sequences of answers are possible in which exactly three are correct?	**(q)**	286
(C)	The number of ways of selecting 10 balls from unlimited number of red, black, white and green balls is, it is given that balls of same colours are identical.	**(r)**	59
(D)	The number of words which can be made from the letters of the word 'MATHEMATICS' so that consonants occur together?	**(s)**	75600

	A	B	C	D		A	B	C	D
(A)	p	r	r	s	**(B)**	s	r	p	q
(C)	r	p	q	s	**(D)**	q	p	s	r

153. If $\alpha = x_1x_2x_3$ and $\beta = y_1y_2y_3$ be two three digit numbers, then the number of pairs of α and β that can be formed so that α can be subtracted from β without borrowing.

(A) $55.(45)^2$ **(B)** $45.(55)^2$ **(C)** $36.(45)^2$ **(D)** 55^3

154. '*n*' digit positive integers formed such that each digit is 1, 2, or 3. How many of these contain all three of the digits 1, 2, and 3 at-least once?

(A) $3(n-1)$ **(B)** $3^n - 2 \cdot 2^n + 3$ **(C)** $3^n - 3 \cdot 2^n - 3$ **(D)** $3^n - 3 \cdot 2^n + 3$

155. $X = \{1, 2, 3, 4.....2017\}$ and $A \subset X; B \subset X; A \cup B \subset X$ here $P \subset Q$ denotes that P is subset of $Q(P \neq Q)$. Then number of ways of selecting unordered pair of sets A and B such that $A \cup B \subset X$.

(A) $\dfrac{(4^{2017} - 3^{2017}) + (2^{2017} - 1)}{2}$ **(B)** $\dfrac{(4^{2017} - 3^{2017})}{2}$

(C) $\dfrac{4^{2017} - 3^{2017} + 2^{2017}}{2}$ **(D)** None of these