Permutation & Combination

Date Planned : __ / __ / __	Daily Tutorial Sheet - 6	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level - 2	Exact Duration :_____

126. The number of subsets of the set $A = \{a_1, a_2, ..., a_n\}$ which contain even number of elements is:

(A) 2^{n-1} **(B)** $2^n - 1$ **(C)** $2^n - 2$ **(D)** 2^n

***127.** In a class tournament when the participants were to play one game with another, two class players fell ill, having played 3 games each (*not played between them*). If the total number of games played is 84, the number of participants at the beginning was:

(A) 15 **(B)** 30 **(C)** ${}^6C_2$ **(D)** 48

128. In the next world cup of cricket there will be 12 teams, divided equally in two groups. Teams of each group will play a match against each other. From each group 3 top teams will qualify for the next round. In this round each team will play against others once. Four top teams of this round will qualify for the semifinal round, when each team will play against the others once. Two top teams of this round will go to the final round, where they will play the best of three matches. The minimum number of matches in the next world cup will be:

(A) 54 **(B)** 53 **(C)** 52 **(D)** 51

129. *ABCD* is a convex quadrilateral 3, 4, 5 and 6 points are marked on the sides, *AB, BC, CD* and *DA* respectively. The number of triangles with vertices on different sides is:

(A) 270 **(B)** 220 **(C)** 282 **(D)** 342

130. The number of 6-digit numbers that can be made with the digits 1, 2, 3 and 4 and having exactly two pairs of digits is:

(A) 480 **(B)** 540 **(C)** 1080 **(D)** 270

131. The last two digits in $X = \sum_{k=1}^{100} k!$ are:

(A) 10 **(B)** 11 **(C)** 12 **(D)** 13

132. In the club election, the number of contestants is one more than the number of maximum candidates for which a voter can vote. If the total number of ways in which a voter can vote be 62, then the number of candidates is:

(A) 7 **(B)** 5 **(C)** 6 **(D)** 8

133. A person predicts the outcome of 20 cricket matches of his home team. Each match can result either in a win, loss or tie for the home team. Total number of ways in which he can make the prediction so that exactly 10 predictions are correct, is equal to:

(A) ${}^{20}C_{10} \cdot 2^{10}$ **(B)** ${}^{20}C_{10} \cdot 3^{20}$ **(C)** ${}^{20}C_{10} \cdot 3^{10}$ **(D)** ${}^{20}C_{10} \cdot 2^{20}$

134. The number of different seven digits numbers that can be written using only the three digits 1, 2 and 3 with the condition that the digit 2 occurs twice in each number is:

(A) ${}^7P_2 \cdot 2^5$ **(B)** ${}^7C_2 \cdot 2^5$ **(C)** ${}^7C_2 \cdot 5^2$ **(D)** ${}^7P_2 \cdot 5^2$

135. The number of ways in which a score of 11 can be made from a throw by three persons, each throwing a single die once is: (Assume dice are identical)

(A) 45 **(B)** 18 **(C)** 27 **(D)** 68

136. A mint prepares metallic calendars specifying months, dates and days in the form of monthly sheets (one-plate for each month). How many types of February calendars should it prepare to serve for all the possibilities in the future years?

(A) 7 **(B)** 14 **(C)** 21 **(D)** 28

137. If $E = \frac{1}{4} \cdot \frac{2}{6} \cdot \frac{3}{8} \cdot \frac{4}{10} \cdots \frac{30}{62} \cdot \frac{31}{64} = 8^x$, then value of x is:

(A) -7 **(B)** -9 **(C)** -10 **(D)** -12

138. For a set of four multiple choice questions with three options (multiple correct possible), no two students have given the same sequence of answers. What is the maximum number of students that sat for the test, for this to be possible, given that each student attempts all the questions?

(A) 4095 **(B)** 2400 **(C)** 1295 **(D)** 2500

139. Let T_n denote the number of triangles which can be formed by using the vertices of a regular polygon of n sides. If $T_{n+1} - T_n = 21$, then n equals:

(A) 5 **(B)** 7 **(C)** 6 **(D)** 4

140. A class consists of 4 boys and g girls. Every Sunday five students, including at least three boys go for a picnic to Appu Ghar, a different group being sent every week. During the picnic, the class teacher gives each girl in the group a doll. If the total number of dolls distributed was 85, then value of g is:

(A) 15 **(B)** 12 **(C)** 8 **(D)** 5