

Dear student following is an Easy level [● ○ ○] test paper. Score of 24 Marks in 15 Minutes would be a satisfactory performance. Questions 1-10(+3, -1) (All questions have only one option correct)

- Q.1** The number of ways in which 9 persons can be divided into three equal groups is-  
 (A) 1680 (B) 840  
 (C) 560 (D) 280
- Q.2** If a man and his wife enter in a bus, in which five seats are vacant, then the number of different ways in which they can be seated is-  
 (A) 2 (B) 5 (C) 20 (D) 40
- Q.3** The number of circular permutations of n different objects is -  
 (A) n! (B) n  
 (C) (n - 2)! (D) (n - 1)!
- Q.4** There are 12 volleyball players in all in a college, out of which a team of 9 players is to be formed. If the captain always remains the same, then in how many ways can the team be formed-  
 (A) 36 (B) 108 (C) 99 (D) 165
- Q.5** Everybody in a room shakes hand with everybody else. The total number of hand shakes is 66. The total number of persons in the room is-  
 (A) 11 (B) 12 (C) 13 (D) 14
- Q.6** In a football championship, there were played 153 matches. Every team played one match with each other. The number of teams participating in the championship is-  
 (A) 17 (B) 18 (C) 9 (D) 13
- Q.7** In a city no two persons have identical set of teeth and there is no person without a tooth. Also no person has more than 32 teeth. If we disregard the shape and size of tooth and consider only the positioning of the teeth, then the maximum population of the city is-  
 (A)  $2^{32}$  (B)  $(32)^2 - 1$   
 (C)  $2^{32} - 1$  (D)  $2^{32-1}$
- Q.8** Two packs of 52 cards are shuffled together. The number of ways in which a man can be dealt 26 cards so that he does not get two cards of the same suit and same denomination is-  
 (A)  ${}^{52}C_{26} \cdot 2^{26}$  (B)  ${}^{104}C_{26}$   
 (C)  $2 \cdot {}^{52}C_{26}$  (D) None of these
- Q.9** The numbers of permutations of n things taken r at a time, when p things are always included, is-  
 (A)  ${}^nC_r \cdot p!$  (B)  ${}^{n-p}C_r \cdot r!$   
 (C)  ${}^{n-p}C_{r-p} \cdot r!$  (D) None of these
- Q.10** The number of ways in which 10 persons can go in two boats so that there may be 5 on each boat, supposing that two particular persons will not go in the same boat is-  
 (A)  $\frac{1}{2} ({}^{10}C_5)$  (B)  $2 ({}^8C_4)$   
 (C)  $\frac{1}{2} ({}^8C_5)$  (D) None of these



MATHEMATICS IIT JEE ( SEPT. 2<sup>nd</sup> WEEK CLASS TEST 2) (PERMUTATION & COMBINATION) ANSWER KEY

Name : ..... Roll No. : .....

	A	B	C	D	A	B	C	D	A	B	C	D
1	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	4	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	5	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	6	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
									10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**ANSWER KEY**

<b>Que.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>
<b>Ans.</b>	A	C	D	D	B	B	C	A	C	B

**SOLUTIONS**
**Sol.1 (A)**

$$\begin{aligned} \text{Total ways} &= \frac{9!}{(3!)^3} \\ &= \frac{9 \times 8 \times 7 \times 6 \times 5 \times 4}{3 \times 2 \times 3 \times 2} = 1680 \end{aligned}$$

**Sol.2 (C)**

There are five seats in a bus are vacant. A man sit on any one of 5 seats in 5 ways. After the man is seated, his wife can be seated in any of 4 remaining seats in 4 ways. Hence total number of ways of seating them =  $5 \times 4 = 20$

**Sol.3 (D)**

$$\text{Required number} = (n - 1)!$$

**Sol.4 (D)**

Required number of ways =  ${}^{11}C_8 = 165$   
 {Since, captain already be chosen, so now from 11 players 8 are to be chosen}

**Sol.5 (B)**

$${}^nC_2 = 66 \Rightarrow n(n - 1) = 132 \Rightarrow n = 12$$

**Sol.6 (B)**

$$\begin{aligned} {}^nC_2 = 153 &\Rightarrow \frac{n(n-1)}{2} = 153 \\ \Rightarrow n &= 18 \end{aligned}$$

**Sol.7 (C)**

We have 32 places for teeth. For each place we have two choices either there is a tooth or there is no tooth. Therefore the number of ways to fill up these places is  $2^{32}$ . As there is no person without a tooth, the maximum population is  $2^{32} - 1$ .

**Sol.8 (A)**

26 cards can be chosen out of 52 cards, in  ${}^{52}C_{26}$  ways. There are two ways in which each card can be dealt, because a card can be either from the first pack or from the second. Hence the total number of ways =  ${}^{52}C_{26} \cdot 2^{26}$

**Sol.9 (C)**

Since number of selections are  ${}^{n-p}C_{r-p}$ . Therefore the arrangement of r things can be done in r! ways. Hence the total permutations are  ${}^{n-p}C_{r-p} r!$ .

**Sol.10 (B)**

First omit two particular persons, remaining 8 persons may be 4 in each boat. This can be done in  ${}^8C_4$  ways. The two particular persons may be placed in two ways one in each boat. Therefore total number of ways are =  $2 \times {}^8C_4$ .