

Dear student following is a Moderate level [O ● O] test paper. Score of 18 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 arrangements which can be made using all the letters of the word LAUGH if the vowels are adjacent is-

- (A) 10 (B) 24 (C) 120 (D) 48

Q.2 If an event can happen in m different ways and when it happens in any one of these ways a second event occurs in n different ways, then the total number of different ways of happening of both the events in succession is-

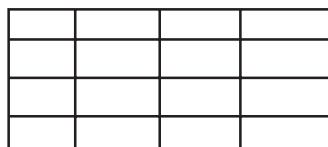
- (A) m + n (B) mn (C) m/n (D) mⁿ

Q.3 The number of ways in which n ties can be selected from a rack displaying 3n different ties is-

- (A) $\frac{3n!}{2n!}$ (B) 3 × n!

- (C) 3n! (D) $\frac{3n!}{n! 2n!}$

Q.4 The number of rectangles in the following figure is :



- (A) 5 × 5 (B) ${}^5P_2 \times {}^5P_2$
(C) ${}^5C_2 \times {}^5C_2$ (D) None of these

Q.5 The sum of all the numbers which can be formed by using the digits 1, 3, 5, 7 all at a time and which have no digit repeated is-

- (A) 16 × 4! (B) 1111 × 3!
(C) 16 × 1111 × 3! (D) 16 × 1111 × 4!

Q.6 There are n different books and m copies of each in a college library. The number of ways in which a student can make a selection of one or more books is-

- (A) (m + 1)ⁿ (B) (m + 1)ⁿ⁻¹

- (C) $\frac{mn!}{(m!)^m}$ (D) ${}^{mn}C_n \times {}^nC_n$

Q.7 On a railway route there are 15 stations. The numbers of tickets required in order that it may be possible to book a passenger from every station to every other is-

- (A) $\frac{15!}{2!}$ (B) 15! (C) $\frac{15!}{13!}$ (D) $\frac{15!}{13! 2!}$

Q.8 5 books of Math and 3 books of Physics are placed on a shelf so that the books on the same subject always remain together. The possible arrangements are-

- (A) 1440 (B) 1956
(C) 720 (D) None of these

Q.9 Fifteen girls compete in a race. The first three places can be taken by them in-

- (A) 3! ways (B) 12! ways
(C) 15 × 14 × 13 ways (D) 42 ways

Q.10 The total number of ways in which a beggar can be given at least one rupee from four 25 paise coins, three 50 paise coins and 2 one-rupee coins is-

- (A) 54 (B) 53
(C) 51 (D) None of these



MATHEMATICS IIT JEE (SEPT. 2nd WEEK CLASS TEST 3) (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"/>	<input type="radio"/>	7	<input type="radio"/>	<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"/>	<input type="radio"/>	8	<input type="radio"/>	<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"/>	<input type="radio"/>	9	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
										10	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

ANSWER KEY

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

SOLUTIONS
Sol.1 (D)

The regard two vowels as one letter.
 \therefore reqd. no. of ways = $4! 2! = 48$.

Sol.2 (B)

mn by Fundamental Theorem.

Sol.3 (D)

$$\text{No. of ways} = {}^{3n}C_n = \frac{3n!}{n! 2n!}$$

Sol.4 (C)

Since each choice of a pair of horizontal lines and a pair of vertical lines gives us a rectangle. Hence the number of rectangles = ${}^5C_2 \times {}^5C_2$

Sol.5 (C)

Reqd. sum = $3! (1 + 3 + 5 + 7)$
 $(1 + 10 + 100 + 1000)$
 [\therefore each digit occurs 3! times in unit's place, ten's place, hundred's place and thousand's place]

Sol.6 (B)

The no. of ways in which a student can make a selection of one or more books.
 $= (m + 1) (m + 1) \dots (m + 1) - 1$
 $= (m + 1)^n - 1$
 [\therefore student can make selection of 0, 1, 2, 3, m books out of each type]

Sol.7 (D)

$$\text{Reqd. no. of tickets} = {}^{15}C_2 = \frac{15!}{2! 13!}$$

Sol.8 (A)

Reqd. no. of ways = $5! 3! 2!$
 [Regard 5 books of Math. as one, 3 books of Physics as one] = $120 \times 6 \times 2 = 1440$

Sol.9 (C)

$$\text{Reqd. no. of ways} = 15 \times 14 \times 13$$

Sol.10 (A)

There are four possibilities
 (i) At least one rupee coin, any number of 50 paise coins, any number of 25 paise coins.
 This can be done in $2 \times 4 \times 5 = 40$ ways.
 (ii) At least two 50 paise coins, any number of 25 paise coins.
 This can be done in $2 \times 5 = 10$ ways.
 (iii) One 50 paise coin, at least two 25 paise coins in $1 \times 3 = 3$ ways.
 (iv) Four 25 paise coins in 1 way.
 Total no. of ways = $40 + 10 + 3 + 1 = 54$ ways