Directions of Test

Test Name	LPU CA 03 - 05 (A)	Total Questions	30	Total Time	50 Mins

Section Name	No. of Questions	Time limit	Marks per Question	Negative Marking
Section 1	6	0:10(h:m)	1	1/4
Section 2	6	0:10(h:m)	1	1/4
Section 3	6	0:10(h:m)	1	1/4
Section 4	6	0:10(h:m)	1	1/4
Section 5	6	0:10(h:m)	1	1/4

Section : Section 1

QNo:- 1 ,Correct Answer:- *A*

Explanation:-
*The last two digits of the sum of all integers will depend on the sums of the last two digits of the integers. If the last digit is 0, the remaining digits can be chosen in 6 * 5 * 4 * 3 = 360 ways. So, there are 360 integers ending in a 0. The ten's digit of these 360 integers will be 1, 2, 3, 5, 6 or 8, each appearing 60 times. If these 360 integers are added, the unit's digit will be 0 and the ten's digits will add up to (1 + 2 + 3 + 5 + 6 + 8) * 60 = 1500.*
*If the last digit is not 0, the last digit can be chosen in 6 ways and the remaining digits can be chosen in 5 * 5 * 4 * 3 = 300 ways. So there are 300 * 6 = 1800 such integers. 300 each of these will end in 1, 2, 3, 5, 6 and 8 respectively. The sum of all these unit's digits will be (1 + 2 + 3 + 5 + 6 + 8) * 300 = 7500. Consider the 300 integers ending in 1. Of these, 60 integers will have 0 in the ten's place and 48 each will have 2, 3, 5, 6 and 8 in the ten's place. This logic can be extended to the other integers ending in 2, 3, 5, 6 and 8. So the sum of the digits in the ten's places will be (1 + 2 + 3 + 5 + 6 + 8) * 5 * 48 = 6000. Combining all of these, the sum of the digits in the unit's places will be 7500 and the sum of the digits in the ten's places will be (1500 + 6000) = 7500. The unit's place of the sum will be 0 and the 750 is carried over to 7500 to make the total 8250 ⇒ Ten's digit is also 0.*
Thus the sum of the last two digits of the integers will be 0.

QNo:- 2 ,Correct Answer:- *C*

Explanation:-
The last two digits of the number could be single digit integers that can be written as 01 or they could be 2-digit integers.
The first two digits will necessarily form a number that is greater than 9 (otherwise we would not have a 4-digit number).
So, the numbers formed by the last two digits can have 30 values starting from 04 through 33 so that the number formed by the first two digits will take values 12, 15 and so on through 99.
If the number formed by the last two digits is a multiple of 11 (11, 22 or 33) or a multiple of 5 (05, 10, 15, 20, 25, 30), the corresponding number formed by the first two digits will have digits that have been repeated.
Besides these 9 numbers, there are 6 other numbers, 13 × 3 = 39, 14 × 3 = 42, 17 × 3 = 51, 24 × 3 = 72, 28 × 3 = 84 and 31 × 3 = 93, where the digits have been repeated.
Thus there are 30 – 9 – 6 = 15 numbers that have all distinct digits.
The required fraction is 15/30 = 1/2.

QNo:- 3 ,Correct Answer:- *B*

Explanation:-
The given number has 4 odd digits and 5 even digits.
A 9-digit integer will have 5 odd positions and 4 even positions.
The 4 odd digits can be arranged in the 4 even positions in (4!/2!2!) = 6 ways.
The 5 even digits can be arranged in the 5 odd positions in (5!/2!3!) = 10 ways.
Thus the total number of integers is 6 × 10 = 60.

QNo:- 4 ,Correct Answer:- *B*

Explanation:-
$\therefore$ Required number of numbers = $5 \times 4 \times 3 \times 2 = 120$

QNo:- 5 ,Correct Answer:- *D*

Explanation:-
There are four numbers 56, 68, 76, & 96 that are divisible by 4 out of the given digits

QNo:- 6 ,Correct Answer:- *C*

Explanation:-
The word 'BIHAR' has 5 letters and all these 5 letters are different.

So,Total words formed by using all these 5 letters = ${}^5P_5 = 5!$
$= 5 \times 4 \times 3 \times 2 \times 1 = 120$

Section : Section 2

QNo:- 7 ,Correct Answer:- *D*

Explanation:-
Three letters out of four can be selected in ${}^4C_3$ *ways as N is essentially one of the letters. So total number of words that can be made will be* ${}^4C_3 \times 4! = 96$.

QNo:- 8 ,Correct Answer:- *A*

Explanation:-
There are 2 vowels and 4 consonants in the letter RANDOM. We can arrange all vowels together in 2! ways and all consonants together in 4! ways. Considering all vowels as one letter and all consonants as one letter, vowels and consonants can be arranged in 2! ways. So the total arrangements are 4!×2!×2! = 96 ways.

QNo:- 9 ,Correct Answer:- *D*

Explanation:-
There will be four cases.
Case I: If only one letter is repeated:
In this case the total words will be $^{10}C_3 \times 3 \times \frac{4!}{2!} = 120 \times 3 \times 12 = 4320.$
Case II: If 2 letters are repeated:
In this case the total words will be $^{10}C_2 \times \frac{4!}{2! \times 2!} = 45 \times 6 = 270.$
Case III: If 3 letters are repeated:
In this case the total words will be $^{10}C_2 \times 2 \times \frac{4!}{3!} = 45 \times 2 \times 4 = 360.$
Case IV: if all the four letters are repeated:
In this case the total words will be 10.
Hence the total words are 4320 + 270 + 360 + 10 = 4960.

QNo:- 10 ,Correct Answer:- *B*

Explanation:- *Alphabetical order of letters is A, A, A,A, N, N, R, Y*
Number of words beginning with A = 7! / (2! × 3!) = 420
Number of words beginning with NAA = 5! / 2! = 60
Number of words beginning with NAN= 5! / 3!= 20
Number of words beginning with NARAA = 3! = 6
Number of words beginning with NARAN= 3! / 2! = 3
Number of words beginning with NARAYAAN= 1
Next word will be NARAYANA
So rank of NARAYANA = 420 + 60 + 20 + 6 + 3 + 1 + 1 =511

QNo:- 11 ,Correct Answer:- *A*

Explanation:- *Alphabetical order of letters is A, C, H, I, N, S*
Number of words beginning with A = 5! = 120
Number of words beginning with C= 5! = 120
Number of words beginning with H= 5! = 120
Number of words beginning with I= 5! = 120
Number of words beginning with N= 5! = 120
The first word that is formed that starts with S is SACHIN
So rank of SACHIN = 120 + 120 + 120 + 120 + 120 + 1 = 601

QNo:- 12 ,Correct Answer:- *D*

Explanation:-
The point to be noticed here is no two boys can sit together, but girls can, so let us arrange girls first:
--G--G--G--G--
These 4 girls can be arranged in 4! ways, upon arranging girls, 5 spaces are created, we can place 4 boys at any 5 places in $5p_4$ *ways*
Therefore answer is $5p_4 \times 4!$ *ways*
120×24 = 2,880 ways.

Section : Section 3

QNo:- 13 ,Correct Answer:- *A*

Explanation:-
6 men can be arranged around a circular table = 5! ways
5 women have 6 places to be seated in between the men so that no two women sit together = $^6P_5$ *= 6! ways*
Total number of required ways = $6! \times 5! = 6 \times (5!)^2$

QNo:- 14 ,Correct Answer:- *B*

Explanation:- $\text{Probability} = \frac{1(\text{A's position}) \times 2!(\text{B's postion}) \times 9!}{(11-1)!} = \frac{1}{5}$

QNo:- 15 ,Correct Answer:- *B*

Explanation:- *The cases corresponding to the condition that no. of girls are not less than the no. of boys are:*

Boys	Girls
0	8
1	7
2	6
3	5
4	4

Required no. of cases = $^8C_8 + {}^5C_1 \times {}^8C_7 + {}^5C_2 \times {}^8C_6 + {}^5C3 \times {}^8C_5 + {}^5C_4 \times {}^8C_4$
$= 1 + 5 \times 8 + 10 \times 28 + 10 \times 56 + 5 \times 70$
$= 1 + 40 + 280 + 560 + 350$
$= 1231$

QNo:- 16 ,Correct Answer:- *B*

Explanation:- *Required ways =* $^9C_4 \times {}^4C_3 + {}^9C_3 \times {}^4C_4$ *= 588 ways*

QNo:- 17 ,Correct Answer:- *B*

Explanation:- *The case arises in this situation are 1 boy and 4 girls or 2 boys and 3 girls or 3 boys and 2 girls or 4 boys and 1 girl*
$= {}^7C_1 \times {}^4C_4 + {}^7C_2 \times {}^4C_3 + {}^7C_3 \times {}^4C_2 + {}^7C_4 \times {}^4C_1$
$= 7 + 84 + 210 + 140$
$= 441$

QNo:- 18 ,Correct Answer:- *A*

Explanation:- *After giving one eraser to each of the 4 kids, there are 3 left.*
They can split 2, 1 or 1, 1, 1. (No kid can get 4)
There are $^4P_2 + {}^4C_3$*, i.e., 16 ways of distributing the erasers.*

Section : Section 4

QNo:- 19 ,Correct Answer:- *C*

Explanation:- *First we give one pencil to each student after that remaining 48 pencils can be distributed such that a student can get any number of pencils, so total number of solution is* $^{50}C_2$.
Number of ways all three students getting an equal number of pencils= 1.
Number of ways exactly two of them are getting same number of pencils = 3×24 = 72.
Hence the number of ways when no two student receives same number of pencils
$= {}^{50}C_2 - 1 - 72 = 1225 - 73 = 1152$

QNo:- 20 ,Correct Answer:- *A*

Explanation:- *as all teddy bears are identical so first we give 3 teddy bears to each toddler after that remaining 6 teddy bears can be distributed according to* $^{n+r-1}C_{r-1}$
Hence required number of ways = $^{9}C_3 = 84$

QNo:- 21 ,Correct Answer:- *B*

Explanation:- *Total number of questions = 200 + 150 + 100 + 250 = 700*
Consider the following events
E = the question selected is an easy question
T = the question selected is a tough question
Y = the question selected is Yes/No type question
F = the question selected is True/False type question
P (E) = 300/700 = 3/7
P (T) = 400/700 = 4/7
P (Y) = 350/700 = 1/2
P (F) = 350/700 = 1/2
P (E ∩ F) = 100/700 = 1/7
Required Probability = P (E/F) = P (E ∩ F)/P (F) = (1/7) /(1/2) = 2/7

QNo:- 22 ,Correct Answer:- *C*

Explanation:-
Probability of hitting the target = 1 – (probability of missing the target)
= 1 – (0.9 × 0.8 ×0.65 × 0.55) = 1 – 0.2574 = 0.7426.

QNo:- 23 ,Correct Answer:- *B*

Explanation:- *Probability of A speaking truth=3/4*
Probability of B speaking truth = 5/6
Probability of A speaking truth and B lying = 3/4 × 1/6 =1/8
Probability of B speaking truth and A lying = 5/6 × 1/4 = 5/24
So 1/8 + 5/24 = 1/3
So option 2 is the answer.

QNo:- 24 ,Correct Answer:- *A*

Explanation:- *In total there were ten persons. These persons can have C (10, 2) =* $^{10}C_2$ *= 45 handshakes. But no one shook hands of his/her spouses. Since there are 5 handshakes among spouses, answer = 45 – 5 = 40*

Section : Section 5

QNo:- 25 ,Correct Answer:- *C*

Explanation:-

Consider that A starts the game. So the probability of A's win = $\frac{1}{2}+\frac{1}{8}+\frac{1}{32}+....$ which is an infinite G.P.

Hence the probability of A's win = $\frac{\frac{1}{2}}{1-\frac{1}{4}}=\frac{2}{3}.$

Hence the probability of B's win = $\frac{1}{3}.$

QNo:- 26 ,Correct Answer:- *A*

Explanation:-

As the coin is fair, hence, the probability of getting head or tail is $\frac{1}{2}$ always. It does not depend upon the previous experiments. So, Ans. is option 1

QNo:- 27 ,Correct Answer:- *B*

Explanation:- *Total outcomes = 36*
Possible outcomes = 11
(2, 3), (2, 6), (4, 3), (4, 6), (6, 3), (6, 6), (3, 4), (3, 6), (6, 4)
Required Probability = 11/36

QNo:- 28 ,Correct Answer:- *A*

Explanation:-
*(1,2,3), (2,3,4),(3,4,5),(4,5,6) and their arrangements 6*4 = 24*
*Total cases = 6*6*6 = 216*
Probability = 24/216 = 1/9

QNo:- 29 ,Correct Answer:- *C*

Explanation:-
In a normal pack of 52 cards, there are 12 face cards and 26 red cards. Two face cards can be selected from the 12 cards in $^{12}C_2$ *ways i.e. 66. This means that a face card is not missing. Next, 2 red cards can be selected in* $^{26}C_2$ *in 325 ways. Again, all the red cards are present. So, the missing card is a non-red non-face card. By options, it should be the ace of spades.*

QNo:- 30 ,Correct Answer:- *B*

Explanation:-
There are 13 hearts and 4 king and one king of hearts.
Neither hearts nor king means 13 + 4 - 1 = 16 cards are not to be chosen.
Total cards that can be chosen = 52 - 16 = 36
Probability = 36 / 52 = 9 / 13