LPU CA 03 - 04 (A) (Answer Keys)

Directions of Test

Test Name	LPU CA 03 - 04 (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:- *B*

Explanation:-
Even digits can be placed only at 2^{nd} , 4^{th} and 6^{th} place and they will permute in 3!/2 ways = 3ways.
Odd digits will occupy 1^{st}, 3^{rd} 5^{th} and 7^{th} place and they will permute in 4!/(2!2!)=6 ways.
Required number = 3 × 6 = 18

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

Explanation:-
Take two cases:
Case I: *When zero is a part of the 3 numbers, i.e. then the remaining two digits can be selected in ${}^9C_2$ ways. In such cases, the total number of numbers that can be formed with two zeros : In this case zeros can be filled in three ways and the remaining two digits can be arranged in 2! ways i.e. ${}^9C_2 \times 3 \times 2! = 216$.*

(or) one zero : ${}^9C_2 \times {}^2C_1 \times {}^3C_1 \times \frac{3!}{2!}$ (3 places for 0, any 1 out of the 2 repeats & then total arrangements)= 18 × 36 = 648.
Hence, total number of cases = 648 + 216 = 864 .....(i)
Case II: *When zero is not one of the three numbers,*

total cases = ${}^9C_3 \times {}^3C_1 \times \frac{4!}{2!}$ (selected 3 out of 9)= 84 × 36 = 3024 ....(ii)
Hence, the total number of numbers = 864 + 3024 = 3888.
As none of the given options gives the same value as written above, therefore, the correct answer is option D.

QNo:- 3 ,Correct Answer:- D

Explanation:-
The number can contain maximum 9 digits and for every place there are 2 choices either 1 or 2.
If no. is 1-digited = 2 nos. are possible
If no. is 2-digited = 2^2 *nos. are possible*
If no. is 3-digited = 2^3 *nos. are possible*
If no. is 4-digited = 2^4 *nos. are possible*
If no. is 5-digited = 2^5 *nos. are possible*
If no. is 6-digited = 2^6 *nos. are possible*
If no. is 7-digited = 2^7 *nos. are possible*
If no. is 8-digited = 2^8 *nos. are possible*
If no. is 9-digited = : first place can be filled in way i.e. by taking 1. Reaming 8 places can be filled either by 1 or by 2 i.e. 2 choices. So, 1×2^8 *nos. are possible in this case.*
So, required answer = $(2^1+2^2$ + ------ + $2^8) + 2^8 = 766$

QNo:- 4 ,Correct Answer:- C

Explanation:-
Sum of 1 digit numbers = 0 + 1 + 4 + 5 = 10
Sum of 2 digit numbers (ending with 0) = 10 + 40 + 50 = 100
Sum of the numbers having a total of 3 digits, one of which is definitely 0. (This will include all the valid three digit numbers as well as the valid two digit numbers having zero as the first redundant digit) =
2! (1 + 4 + 0) x 111 + 2! (1 + 0 + 5) x 111 + 2! (0 + 4 + 5) x 111 = 1110 + 1332 + 1998 = 4440
Sum of the numbers having all the 4 digits (This will include all the valid four digit numbers as well as the valid three digit numbers having zero as the first redundant digit) = 3! (0 + 1 + 4 + 5) x 1111 = 66660
Thus, sum of all such numbers possible = 10 + 100 + 4440 + 66660 = 71210.

QNo:- 5 ,Correct Answer:- A

Explanation:-
Suppose the 3 digits are x, y and z. Since each of these digits will appear at least once in the 5-digit number, there are 2 possibilities – (1) one of the digits appears 3 times and the other 2 digits appear once each; (2) two of the digits appear twice each and the third digit appears once.
Consider the first possibility. The digit that appears 3 times can be chosen in ${}^3C_1 = 3$ *ways. The digits can now be arranged in (5!/3!) = 20 ways. So, 3 × 20 = 60 numbers can be formed.*
Consider the second possibility. The 2 digits that appear 2 times can be chosen in ${}^3C_2 = 3$ *ways. The digits can now be arranged in (5!/2!2!) = 30 ways. So, 3 × 30 = 90 numbers can be formed.*
Thus, a total of 60 + 90 = 150 numbers can be formed.

QNo:- 6 ,Correct Answer:- A

Explanation:- *The number of letters in the word VALUE are 5. So the total number of words = 5! = 120.*

Section : Section 2

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

Explanation:-
Number of ways for arranging n elements = n!
Number of arrangements = 8! = 40320
Hence answer is option D

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

Explanation:-
There are 3 vowels in TRIANGLE and four odd places. So these 3 vowels can be arranged in $^4P_3$ *ways. The remaining 5 letters can be arranged in 5 places in 5! ways. So total number of words =* $^4P_3 \times 5! = 2880$.

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

Explanation:-
There are 11 alphabets in the word, out of which 6 are vowels.
There are 6 odd places and 5 even places.
6 vowels can be put into 6 odd places in $^{6!} / _{2!\ 2!}$ *ways.*
(since there is repetition of 2 vowels)
Also 5 consonants X, M, N, T and N. These can be arranged in $^{5!}/_{2!}$ *ways.*
So total number of ways is 180 × 60 = 10,800.
Hence the answer is option 2.

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

Explanation:- *Alphabetical order of letters is A, E, F, H, R, T*
Number of words beginning with A = 5! = 120
Number of words beginning with E = 5! = 120
Number of words beginning with FAE = 3! = 6
Number of words beginning with FAH = 3! = 6
Number of words beginning with FAR = 3! = 6
Number of words beginning with FATE = 2! = 2
Number of words beginning with FATH = 2! = 2
As words here will be FATHER or FATHRE...Since FATHER will come first in alphabetical order
Rank of FATHER = 120+120+6+6+6+2+1 = 261

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

Explanation:- *Alphabetical order of letters is E, H, I, N,T, Z*
Number of words beginning with E = 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
Number of words beginning with T = 5! = 120
Number of words beginning with ZEH = 3! = 6
Number of words beginning with ZEI = 3! = 6
Number of words beginning with ZENH = 2! = 2
The first word begning with ZENI is ZENIHT and next is ZENITH
So rank of ZENITH = 120 + 120 + 120 + 120 + 120 + 6 + 6 + 2 + 2 = 616

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

Explanation:-
In order that the boys may not be adjacent to each other,we have to position the girls first. The 5 girls can be positioned in 120 ways. Rahul has to be positioned at the either end. In the 5 slots between the 5 girls we have to position the other 3 boys. This can be done in $^5P_3$ *or 60 ways.*
The total number of ways in which the 9 children can form the queue is (120) (60) × 2 or 10(6!) × 2 = 14400.
Choice (B)

Section : Section 3

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

Explanation:-
Number of arrangements = $\frac{(n-1)!}{2} = \frac{19!}{2}$

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

Explanation:-
Required number of ways = All of them are arranged – when 3 girls are arranged together
= 8! – 6! × 3! = 36000.
Option A

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

Explanation:- *Since, one boy is already selected then only one boy is to be selected from 3 boys and one particular girl is not to be selected so only 2 girls is to be selected from 3 girls.*
Total number of ways $^3C_1 \times {}^3C_2 = 3 \times 3 = 9$

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

Explanation:- *Case I: 1 girl + 4 boys which can be done in =* $^{3}C_{1} \times {}^{6}C_{4} = 3 \times 15 = 45$
Case II: 2 girls + 3 boys which can be done in = $^{3}C_{2} \times {}^{6}C_{3} = 3 \times 20 = 60$
Case III: 3 girls + 2 boys which can be done in = $^{3}C_{3} \times {}^{6}C_{2} = 1 \times 15 = 15$
Required ways = 45 + 60 + 15 = 120

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

Explanation:- *There are two possibilities*
(i) Those three students join
(ii) Those three students do not join
So, required no. of ways = $^{17}C_{7} + {}^{17}C_{10}$

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

Explanation:-
Let the 3 coffee cups represent 1 unit. This 1 unit and the 3 cans of juice can be arranged in 4!/3! = 4 ways. Now, the 2 tea cups can be placed in any 2 of the 5 available slots in $^{5}C_{2} = 10$ *ways. Thus the total number of arrangements is 4 × 10 = 40.*

Section : Section 4

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

Explanation:- *Since the balls are identical so first we give one ball to Anita, two balls to Vijya and three balls to Chetna. After that remaining balls can be distributed in any manner.*
So the number of ways of distributing is $^{11}C_{2} = 55$

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

Explanation:- *As the candies are identical so first we give 2 candies each to 2 students and one candy each to 6 students. Remaining candies are 20 – 10 = 10*
So the number of ways of distributing candies is $^{17}C_{7}$*, but we also have to choose 2 children out of the 8, hence total number of ways* $^{8}C_{2} \times {}^{17}C_{7}$

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

Explanation:- *Let A be the event getting a sum greater than 9, and B be the event getting a 5 on black die.*
A = {(4, 6), (6, 4), (5, 5), (6, 5), (5, 6), (6, 6)}
B = {(5, 1), (5, 2), (5, 3), (5, 4), (5, 5), (5, 6)}
P (A) = 6/36 = 1/6
P (B) = 6/36 = 1/6
P (A ∩ B) = 2/36 = 1/18
Required Probability = P (A/B) = P (A ∩ B)/P (B) = 1/3

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

Explanation:-

$P(A) = \frac{4}{5}; P(A') = \frac{1}{5}$

$P(B) = \frac{3}{4}; P(B') = \frac{1}{4}$

$P(C) = \frac{2}{3}; P(C') = \frac{1}{3}$

Reqd. Prob. $= P(A \cap B \cap C') + P(A \cap B' \cap C) + P(A' \cap B \cap C) + P(A \cap B \cap C)$

$$= \frac{4}{5}\times\frac{3}{4}\times\frac{1}{3}+\frac{4}{5}\times\frac{1}{4}\times\frac{2}{3}+\frac{1}{5}\times\frac{3}{4}\times\frac{2}{3}+\frac{4}{5}\times\frac{3}{4}\times\frac{2}{3}$$

$$= \frac{12+8+6+24}{60} = \frac{50}{60} = \frac{5}{6}$$

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

Explanation:- *Let E_1 = Both A and B speak truth*
E_2 = Both A and B speak false
And E = A and B agree in a statement.

We can see $P(A) = \frac{75}{100} = \frac{3}{4}$ and $P(B) = \frac{80}{100} = \frac{4}{5}$

So $P(E_1) = \frac{3}{4}\times\frac{4}{5} = \frac{3}{5}$, $P(E_2) = \frac{1}{4}\times\frac{1}{5} = \frac{1}{20}$

Clearly $P(E/E_1) = 1$and $P(E/E_2) = 1$

$$P(\frac{E_1}{E}) = \frac{P(E_1)P(E/E_1)}{P(E_1)P(E/E_1)+P(E_2)P(E/E_2)} = \frac{\frac{3}{5}\times 1}{\frac{3}{5}+\frac{1}{20}} = \frac{12}{13}$$

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

Explanation:- *P (both selected) = 1/7 × 1/5 = 1/35*

Section : Section 5

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

Explanation:-
Total cases = 4 [HT, TH, HH, TT]
Favorable case = {TT, HH]
So required probability $= \frac{2}{4} = \frac{1}{2}$

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

Explanation:-
Total cases $= 2^6 = 64$
Except one case of all tails rest will have at least one head.
$\therefore$ Required probability $= 1 - \frac{1}{64} = \frac{63}{64}$

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

Explanation:-
Total Cases $= 6^3 = 216$
Favourable cases = 6
$\therefore$ Required Probability $= \frac{6}{216}$
here favourable cases are (1,1,1) , (2,2,2) , (3,3,3) , (4,4,4) , (5,5,5) , (6,6,6)
Which is equal to 1/36. Hence 1st option.

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

Explanation:-
Whenever the dices will be thrown the sum obtained on two dices will be odd or even.
In half the cases sum is odd and in half the cases sum is even

$\therefore$ Probability $= \frac{1}{2}$

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

Explanation:-
Two packs have four kings in each suit i.e. a total of eight kings. For the first card probability of getting a king is 8/104. For the second card only three suits are available each with two kings, so six favorable options are available so 6/103.

So option C.

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

Explanation:-
Required probability $= \frac{26}{52} \times \frac{26}{52} = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$