LPU CA 03 - 01 (A) (Answer Keys)

Directions of Test

Test Name	LPU CA 03 - 01 (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:- *D*

Explanation:-
If number is 1 digit number, Number of ways= 5.

If number is 2 digit number, Number of ways=5×4=20

If 3 digit number, Number of ways= 5×4×3= 60

If 4 digit number, Number of ways=5×4×3×2=120

If 5 digit number, Number of ways=5×4×3×2×1=120.

By adding these we get the sum as 325.

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

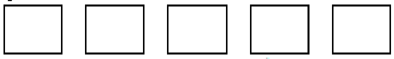
Explanation:-
In order that the number is divisible by 4, its last two digits should be divisible by 4. So last two places can be filled by numbers 12, 16, 24, 32, 36, 52, 56, 64.
The last two digit places can be filled in 8 ways. Remaining 3 places in 4x3x2 ways
Hence no. of 5 digit nos. which are divisible by 4 are 24 × 8 = 192.

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

Explanation:-
We can make upto 6 digit numbers, using digits 0, 7, 8. For a six digit number, 6^{th} digit can be 7 or 8. All other digits can be 0, 7,or 8. So total number of six digit number so formed is 2 (3^5),similarly total number of 5 digit numbers so formed is 2(3^4).......& so on. So total such numbers are 2($3^5 + 3^4 +....+3^0$) = 728.

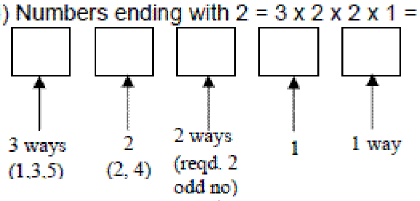
QNo:- 4 ,Correct Answer:- *B*

Explanation:-

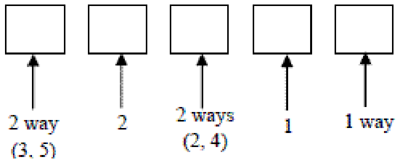


We have 1, 2, 3, 4, 5 (5 digits) and 5 places viz 1st, 2nd, 3rd, 4th, 5th i.e. 2 even (2nd & 4th place), 3 odd (1st, 3rd, 5th place)

(i) Numbers ending with 2 = 3 x 2 x 2 x 1 = 12.



(ii) Numbers ending with 4 = 3 x 2 x 2 x 1 = 12. (iii) Numbers ending with 1 = 2 x 2 x 2 = 8



(iv) Numbers ending with 3 = 2 × 2 × 2 × 1 = 8
(v) Numbers ending with 5 = 2 × 2 × 2 × 1 = 8
Case (iii), (iv) & (v) will have repitition when odd digits are placed at 3rd & 5th place.
The sum of digits = 12 × 2 + 12 × 4 + 8 × (1 + 3 + 5) × 2 = 216. So option (2).

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

Explanation:-
The total number of integers that can be formed is 3 × 3 × 2 × 1 = 18 If we write down all these four digits numbers the digits 1, 2 and 4 will appear six times each in the thousands place. In the units, tens and hundreds places, 0 will appear six times each and the digits 1, 2 and 4 will appear four times each. The sum will be 6(1 + 2 + 4) × 1000 + 4(1 + 2 + 4) × 111 = 45,108.

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

Explanation:-
There are 11 symmetric letters. Number of 4 letters words with all prime letters is 11P4 = 11 × 10× 9 × 8 = 7920. Hence (1).

Section : Section 2

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

Explanation:-
Number of arrangement = 4! = 24. Hence first option.

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

Explanation:-
Three words can be selected in $^5C_3$ *ways and D is essentially one of the letters. So total number of words can be* $^5C_3$ *x 4!=240*

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

Explanation:-
Three words can be selected out if 5 words in $^5C_3$ *ways as N is essentially one of the letters. so total number of words that can be made will be* $^5C_3 \times 4! = 240$

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

Explanation:- *Alphabetic order of letters :- A,I,N,P,S*
Number of words starting with A = 4! = 24
Number of words starting with I = 4! = 24
Number of words starting with N = 4! = 24
Number of words starting with P = 4! = 24
Number of words starting with S = 4! = 24
Number of words starting with SA = 3! = 6
Number of words starting with SI =3! = 6
Number of words starting with SN = 3! = 6
Number of words starting with SP = 3! = 6
In words starting with SP first word is SPAIN
So now add the no. of words before SPAIN+1
Rank of SPAIN =24+24+24+24+6+6+6+1=115

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

Explanation:- *Alphabetic order of letters is C, C, E, S, S, S, U*
Number of words starting with C = 6!/3! = 120
*Number of words starting with E = 6!/(3!*2!) = 60*
Number of words starting with SC = 5!/2! = 60
*Number of words starting with SE = 5!/(2!*2!) 30*
Number of words starting with SS = 5!/2! = 60
Rank of SUCCESS = 120 + 60 + 60 + 30 + 60 + 1 = 331

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

Explanation:-
n(S) = number of ways of sitting 12 persons at round table = (12 - 1)! = 11!
Since two persons will be always together, then number of persons =10 + 1 = 11
So, 11 persons will be seated in (11 - 1)! = 10! ways at round table and 2 particular persons will be seated in 2! ways.
*n(A)= The number of ways in which two persons always sit together = 10! * 2*
*P(A) = n(A)/ n(S) = 10! * 2! / 11! =* $^2/_{11}$

Section : Section 3

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

Explanation:-
The six boys can be seated in 6! ways. In each of these arrangements 7 places are created as × B × B × B × B × B × B × Since no two girls will sit together so we have to arrange 4 girls in these 7 places. This can be done in $^7P_4$ ways. So total number of seating arrangements = 6! × $^7P_4$ = 604800.

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

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. RAMAN has to be positioned right at the 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) = 7200.

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

Explanation:-
Required number of committee's = $^5C_2 \times {}^6C_3$
= 10 × 20 = 200

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

Explanation:- $^8C_5 \Rightarrow (8 \times 7 \times 6)/(3 \times 2 \times 1) \Rightarrow 56$ *ways.*

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

Explanation:-
The committee may has 2 women or 3 women or 4 women. So the total cases are
$\left({}^4C_2 \times {}^7C_4\right) + \left({}^4C_3 \times {}^7C_3\right) + {}^4C_4 \times {}^7C_2$
= 210 + 140 + 21 = 371
Option D

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

Explanation:- *The total number of cases = $^{10}C_5$ = 252.*

Section : Section 4

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

Explanation:- *In a two pan balance, if we want to find defective ball and if N is the number of minimum weighings required to ensure the identification of that defective ball then 3^N > 770, where N has to be the minimum possible integer. So in this case N=7*

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

Explanation:-
When 21 books of Literature are arranged in a row, there will create 22 places. Now we have to place 19 books of Nature at these 22 places which can be done in $^{22}C_{19}$ *= 1540 ways.*

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

Explanation:-

Let E_1 be the event that the answer is guessed, E_2 be the event that the answer is copied, E_3 be the event that the examinee knows the answer and E be the event that the examinee answered correctly.

Given $P(E_1) = \frac{1}{3}, P(E_2) = \frac{1}{6}$

Assume that events E_1, E_2 & E_3 are exhaustive.

$P(E_1) + P(E_2) + P(E_3) = 1$

$P(E_3) = 1 - P(E_1) - P(E_2) = 1 - \frac{1}{3} - \frac{1}{6} = \frac{1}{2}$

Now $P(E/E_1)$ = probability of getting a correct answer by guessing = $\frac{1}{4}$

[since these are 4 alternatives]

$P(E/E_2)$ = probability of answering correctly by copying = $\frac{1}{8}$

$P(E/E_3)$ = probability of answering correctly by knowing =1

Clearly (E_3/E) is the event he knew the answer to the question given that he correctly answered it. $\therefore$

$$P(E_3/E) = \frac{P(E_3)P(E/E_3)}{P(E_1)P(E/E1)+P(E_2)P(E/E_2)+P(E_3)P(E/E_3)}$$

$$\therefore P(E_3/E) = \frac{\frac{1}{2}\times 1}{\frac{1}{3}\times\frac{1}{4}+\frac{1}{6}\times\frac{1}{8}+\frac{1}{2}\times 1} = \frac{24}{29}.$$

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

Explanation:-
Probability of A hitting the target = $\frac{4}{5} \Rightarrow P(\bar{A}) = \frac{1}{5}$

Probability of B hitting the target = $\frac{3}{4} \Rightarrow P(\bar{B}) = \frac{1}{4}$

Probability of C hitting the target = $\frac{2}{3} \Rightarrow P(\bar{C}) = \frac{1}{3}$

We have 2 cases: - 1. All 3 hit 2. Exactly 2 persons hit

1. P (all 3hit) = $\frac{4}{5} \times \frac{3}{4} \times \frac{2}{3} = \frac{2}{5}$

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

$\Rightarrow \frac{1}{5} + \frac{2}{15} + \frac{1}{10} \Rightarrow \frac{6+4+3}{30} = \frac{13}{30}$

So required probability = $\frac{2}{5} + \frac{13}{30} \Rightarrow \frac{25}{30} = \frac{5}{6}$.

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

Explanation:-
Jack and Jill will contradict each other when one speaks the truth and the other lies.
Probability that Jack and Jill contradict each other = (1/ 4 × 2 / 5) + (3/ 4 × 3 / 5) = 1/ 10 + 9/ 20 = 11/ 20 = 55% .

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

Explanation:-
First we will select 5 out of 10 chairs in $^{10}C_5$ *ways for all ladies to seat. Then these ladies can seat on these chairs in 5! ways.*

Now their husbands can be seated such that no husband seats in front of or behind his wife in $5!\left(\frac{1}{2!} - \frac{1}{3!} + \frac{1}{4!} - \frac{1}{5!}\right)$

Hence, total number of possible arrangements $= {}^{10}C_5 \times 5! \times 5!\left(\frac{1}{2!} - \frac{1}{3!} + \frac{1}{4!} - \frac{1}{5!}\right) = {}^{10}C_5 \times 120 \times 44.$
Hence option 3.

Section : Section 5

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

Explanation:- *For the person to make three trials no heart should come up in the first two and the probability for that is*
$\frac{39}{52} * \frac{39}{52}$,
third trial the probability is $\frac{13}{52}$, the net probability is $\frac{39}{52} * \frac{39}{52} * \frac{13}{52} = \frac{9}{64}$

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

Explanation:- *The probability of picking two reds, P(RR) = (2/4)(1/3) = 2/12;*
Similarly P(BB) =2/12.
Therefore, P(same colour) = 4/12 = 1/3.
Alternatively, it doesn't matter whether the first card is red or black,
P(2nd card is the same) = 1/3.

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

Explanation:-
If P(Red on 2nd die) = p, then P(Blue on 2nd die) = 1 - p.
P(same colour) = P(RR) + P (BB)
= (5/6) p + (1/6) (1 - p)
= (4p + 1)/6.
But as we are trying to get, P(same colour) = ½ = 3/6,
it follows that 4p + 1 = 3, 4p = 2, and p = 1/2; that is, three red and three blue faces.
This can be solved in a surprisingly simple way. Regardless of obtaining red or blue on the first die, the only way we would have an equal chance of getting two faces of the same colour is if the second die has an equal number of red and blue faces.

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

Explanation:-
There are eleven cases in which 1 appears
i.e. (1, 2) (1, 3) (1, 4) (1, 5) (1, 6)
(1, 1) (2, 1) (3, 1) (4. 1)
(5, 1) (6, 1)
So required Probability $= 1 - \frac{11}{36} = \frac{25}{36}$

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

Explanation:-
Total Cases $= 2^3 = 8$
Favourable Cases = 1
$\therefore$ Probability $= \frac{1}{8}$

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

Explanation:-
Required Probability $= {}^{10}C_5 p^5 q^5$
Where p is the probability of getting head and q is not getting head.
So probability $= {}^{10}C_5 \times \left(\frac{1}{2}\right)^5 \left(\frac{1}{2}\right)^5 = \frac{63}{256}$