Started on	Thursday, 8 July 2021, 2:43 PM
State	Finished
Completed on	Thursday, 8 July 2021, 3:09 PM
Time taken	26 mins 4 secs
Marks	13.00/21.00
Grade	**6.19** out of 10.00 (**62**%)

Question **1**

Incorrect

Mark 0.00 out of 1.00

8223064

Suppose that a procedure can be broken down into a sequence of two tasks. If there are n_1 ways to do the first task and for each of these ways of doing the first task, there are n_2 ways to do the second task, then there are **[...]** ways to do the procedure.

What is **[...]**?

Select one:

- a. n_2.
- b. n_1.
- c. n_1+n_2. ✖
- d. n_1n_2.

Your answer is incorrect.

The correct answer is: n_1n_2.

Question **2**

Correct

Mark 1.00 out of 1.00

8223064

Place k+1 objects into k boxes, then there are at least one box consisting of **[...]** or more object(s).

What is **[...]**?

Select one:

- a. 5.
- b. 3.
- c. 2. ✔
- d. 4.

Your answer is correct.

The correct answer is: 2.

Question **3**

Correct

Mark 1.00 out of 1.00

8223064

If N objects are placed into k boxes, then there is at least one box consisting of at least **[...]** objects.

What is **[...]**?

Select one:

- a. N.
- b. $\lceil k/N \rceil$.
- c. k.
- d. $\lceil N/k \rceil$. ✔

Your answer is correct.

The correct answer is: $\lceil N/k \rceil$.

Question **4**

Correct

Mark 1.00 out of 1.00

8223064

Among 2000 new students (in the academic year 2019-2020, at TLU) there are at least **[...]** who have the same birthday.

(Suppose that a year has 365 days)

What is **[...]**?

Select one:

- a. 8.
- b. 9.
- c. 7.
- d. 6. ✔

Your answer is correct.

The correct answer is: 6.

Question **5**

Correct

Mark 1.00 out of 1.00

8223064

Suppose that each one of 100 students who are taking the MA101 course must do a test among a list of 25 tests. There are at least [...] students who do the same test.

What is [...]?

Select one:

- a. 5.
- b. 4. ✔
- c. 10.
- d. 25.

Your answer is correct.

The correct answer is: 4.

Question **6**

Correct

Mark 1.00 out of 1.00

8223064

A pine forest has 5 millions pine trees, each pine tree has no more than 500000 leaves. Then, at least **[...]** pine trees have the same numbers of leaves.

What is **[...]**?

Select one:

- a. 12.
- b. 15.
- c. 11.
- d. 10. ✔

Your answer is correct.

The correct answer is: 10.

Question **7**

Incorrect

Mark 0.00 out of 1.00

8223064

List all the 2-permutations of $\{a, b, c\}$.

Select one:

- a. $\{a, b\},\{a, c\},\{b, c\}$
- b. $abc, acb, bac, bca, cab, cba$
- c. ab, ac, bc ✖
- d. ab, ac, ba, bc, ca, cb

Your answer is incorrect.

The correct answer is: ab, ac, ba, bc, ca, cb

Question **8**

Correct

Mark 1.00 out of 1.00

8223064

The number of 2-combinations of $\{a, b, c, d\}$ is

Select one:

- a. 24
- b. 12
- c. 9
- d. 6 ✔

Your answer is correct.

The correct answer is: 6

Question **9**

Incorrect

Mark 0.00 out of 1.00

8223064

List all the 2-combinations of $\{a, b, c\}$.

Select one:

- a. ab, ac, bc
- b. ab, ac, ba, bc, ca, cb ✖
- c. $\{a, b\},\{a, c\},\{b, c\}$
- d. $abc, acb, bac, bca, cab, cba$

Your answer is incorrect.

The correct answer is: $\{a, b\},\{a, c\},\{b, c\}$

Question **10**

Correct

Mark 1.00 out of 1.00

8223064

How many bit strings of length 10 contain exactly three 1s?

Select one:

- a. $C(10,3)$ ✔
- b. 2^7
- c. $P(10,3)$
- d. 2^{10}

Your answer is correct.

The correct answer is: $C(10,3)$

Question **11**

Incorrect

Mark 0.00 out of 1.00

8223064

How many bit strings of length 4 contain at least a 1?

Select one:

- a. 16 ✖
- b. 4
- c. 3
- d. 15

Your answer is incorrect.

The correct answer is: 15

Question **12**

Correct

Mark 1.00 out of 1.00

8223064

The number of permutations of $\{a, b, c, d\}$ is

Select one:

- a. 12
- b. 6
- c. 24 ✔
- d. 1

Your answer is correct.

The correct answer is: 24

Question **13**

Correct

Mark 1.00 out of 1.00

8223064

A class at TLU has 40 English majors and 20 Japanese majors, knowing that there are 10 students who specialize in both English and Japanese.

How many students are there in the class?

Select one:

- a. 70.
- b. 60.
- c. 80.
- d. 50. ✔

Your answer is correct.

The correct answer is: 50.

Question **14**

Incorrect

Mark 0.00 out of 1.00

8223064

If a task can be done either in one of n_1 ways or in one of n_2 ways, where none of the set of n_1 ways is the same as any of the set of n_2 ways, then there are **[...]** ways to do the task.

What is **[...]**?

Select one:

- a. $n_1 + n_2$.
- b. $n_1 n_2$. ✖
- c. $n_1^{n_2}$.
- d. None of these.

Your answer is incorrect.

The correct answer is: $n_1 + n_2$.

Question **15**

Correct

Mark 1.00 out of 1.00

8223064

Let A_1 and A_2 be two finite sets. Then

Select one:

- a. $|A_1 \cup A_2| = |A_1| + |A_2| - |A_1 \cap A_2|$. ✔
- b. $|A_1 \cup A_2| = |A_1| + |A_2| + |A_1 \cap A_2|$.
- c. $|A_1 \cup A_2| = |A_1| + |A_2|$.
- d. $|A_1 \cup A_2| = |A_1 \| A_2|$.

Your answer is correct.

The correct answer is: $|A_1 \cup A_2| = |A_1| + |A_2| - |A_1 \cap A_2|$.

Question **16**

Correct

Mark 1.00 out of 1.00

8223064

Assume that the first floor in the B building at TLU has 6 small rooms and 3 large rooms. Each small room has 41 chairs, each large room has 81 chairs. How many chairs are there in the floor?

Select one:

- a. 489. ✔
- b. 131.
- c. 490.
- d. None of these.

Your answer is correct.

The correct answer is: 489.

Question **17**

Incorrect

Mark 0.00 out of 1.00

8223064

How many dicimal strings of the form $a_1a_2a_3a_4a_5$?

Select one:

- a. 15.
- b. 5^{10}. ✖
- c. 10^5.
- d. 50.

Your answer is incorrect.

The correct answer is: 10^5.

Question **18**

Incorrect

Mark 0.00 out of 1.00

8223064

How many functions are there from a set of 10 elements to a set of 5 elements?

Select one:

- a. 10^5. ✖
- b. 5^{10}.
- c. 0.
- d. 50.

Your answer is incorrect.

The correct answer is: 5^{10}.

Question **19**

Correct

Mark 1.00 out of 1.00

8223064

How many one-to-one function from a set of n elements to itself?

Select one:

- a. n!. ✔
- b. 2n.
- c. n^2.
- d. 0.

Your answer is correct.

The correct answer is: n!.

Question **20**

Correct

Mark 1.00 out of 1.00

8223064

Suppose a situation that the A building at TLU has 7 floors, each floor has 9 classrooms; whereas the B building has 3 floors which have classrooms and each of them has 10 classrooms.

So the A building has 7×9=63 classrooms, the B building has 3×10=30 ones. To sum up, both the A and B buildings totally have 63+30=93 classrooms.

The above proos is using

Select one:

- a. both the sum rule and the product rule. ✔
- b. only the sum rule.
- c. only the product rule.
- d. None of these.

Your answer is correct.

The correct answer is: both the sum rule and the product rule.

Question **21**

Incorrect

Mark 0.00 out of 1.00

8223064

How many bit strings of length 10 begin with 11111 or finish with 00000?

Select one:

- a. $2\times2^5-1$.
- b. 2×2^5.
- c. 2^5.
- d. 2^{10}. ✖

Your answer is incorrect.

The correct answer is: $2\times2^5-1$.

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