Quiz (ECE 313/ECE317, Fall 2023):

Question1: Choose one answer.
How many different ways can the letters of the word **MATH** be rearranged to form a four-letter code word?

1) 26

2) 25

3) 24

Question2: Choose one answer.
How many passwords can be made using "PROBABILITYECE313"

1) 17!

2) $\dfrac{17!}{2!3!4!}$

3) $\dfrac{17!}{2!2!2!2!}$

Question3: Choose one answer.
How many different ways can six letters of the word TRIANGLE be arranged?

1) 20160

2) 20170

3) 20180

Question4: Choose one answer.
Using the digits 1, 2, 3 and 5, how many 4 digit numbers can be formed if The first digit must be 3 and repetition of digits is not allowed?

1) 6

2) 7

3) 8

Question5: Choose one answer.
Suppose at a particular restaurant you have 3 choices for an appetizer (soup, salad or breadsticks), 5 choices for a main course (hamburger, sandwich, quiche, fajita or pasta) and 2 choices for dessert (pie or ice cream). If you are allowed to choose exactly one item from each category for your meal, how many different meal options do you have?

1) 20

2) 15

3) 30

Question6: Choose one answer.
Suppose at a particular restaurant you have 3 choices for an appetizer (soup, salad or breadsticks), 5 choices for a main course (hamburger, sandwich, quiche, fajita or pasta) and 2 choices for dessert (pie or ice cream). If you are allowed to choose two appetizers, one main course and two desserts, how many different meal options do you have?

1) 20

2) 15

3) 30

Question7: Choose one answer.
What is the probability of randomly drawing five cards from a 52 cards deck and getting exactly one Ace.

1) $\dfrac{C_1^4 + C_4^{48}}{C_5^{52}}$

2) $\dfrac{C_1^4 \times C_4^{48}}{C_5^{52}}$

3) $\dfrac{C_2^4 \times C_3^{48}}{C_5^{52}}$

Question8: Choose one answer.
In how many ways can we distribute the 52 cards deck fairly over 4 persons

1) $\dfrac{52!}{13!}$

2) $4 \times C_{13}^{52}$

3) $\dfrac{52!}{13!13!13!13!}$

Question9: Choose one answer.
In how many ways can we distribute the 52 cards deck if we want to give to Sara 17 cards, to Jacob 17 cards and to their Mam 18 cards?

1) $\dfrac{52!}{17!17!18!}$

2) $C_{17}^{52} + C_{17}^{52} + C_{18}^{52}$

3) $C_{17}^{52} \times C_{17}^{52} \times C_{18}^{52}$

Question10: Choose one answer.
A poker hand consists of a sample of size 5 drawn from the 52 cards deck. How many poker hands consist of 2 Aces, 2 Kings and a card of a different denomination?

1) 1582

2) 1583

3) 1584

Question11: Choose one answer.
An urn contains 7 white and 4 black balls. We draw 3 balls **simultaneously** (that is to say, we draw 4 balls without replacement and we do not take into account the order). In how many ways can we draw 2 whites and 1 black?

1) $C_2^7 \times C_1^4$

2) $C_2^7 + C_1^4$

3) $C_1^7 \times C_2^4$

Question12: Choose one answer.
In an urn, there are 5 white balls and 4 black balls. Three balls are drawn **successively without replacement.** In how many ways can we draw these 3 balls?

1) $A_3^9 = 504$

2) $C_2^7 + C_1^4$

3) $C_1^7 \times C_2^4$

Question13: Choose one answer.
The United States Senate Appropriations Committee consists of 29 members, 15 Republicans and 14 Democrats. The Defense Subcommittee consists of 19 members, 10 Republicans and 9 Democrats. How many different ways can the members of the Defense Subcommittee be chosen from among the 29 Senators on the Appropriations Committee?

1) $C_{10}^{15} + C_9^{14}$

2) $C_{10}^{15} \times C_9^{14}$

3) 10×9

Question14: Choose one answer.
A charity benefit is attended by 25 people at which three \$50 gift certificates are given away as door prizes. Assuming no person receives more than one prize, how many different ways can the gift certificates be awarded?

1) $25 + 24 + 23$

2) $25 \times 24 \times 23$

3) $25 - 24 - 23$

Question15: Choose one answer.
How many ways can five different door prizes be distributed among five people?

1) 125

2) 120

3) 300

Question16: Choose one answer.
A combination lock consists of 5 number from 0 to 39. If there are no restriction on the numbers, how many possible combinations?

1) 658008

2) 102400000

3) 7890960

Question17: Choose one answer.
You are deciding which awards you are going to display in your room. You have 8 awards but you only have room to display 4 awards. How many ways could you choose the 4 awards to display?

1) 70

2) 80

3) 90

Question18: Choose one answer.
A boy lives at X and wants to go to School at Z. From his home X he has to first reach Y and then Y to Z. He may go X to Y by either 3 bus routes or 2 train routes. From there, he can either choose 4 bus routes or 5 train routes to reach Z. How many ways are there to go from X to Z?

1) 44

2) 45

3) 46

Question19: Choose one answer.
Suppose that we have the following data set of raining day during a year of 365 days

Months	Ja	Fe	Ma	Ap	Ma	Ju	Jui	Au	Se	Oc	No	De
number of days	(31)	(28)	(31)	(30)	(31)	(30)	(31)	(31)	(30)	(31)	(30)	(31)
raining days	15	11	10	7	3	2	0	0	4	8	12	19

If a day is selected randomly, what is the probability that it is a raining day?

1) $\dfrac{90}{365}$

2) $\dfrac{91}{365}$

3) $\dfrac{92}{365}$

Question20: Choose one answer.

Suppose that we have the following data set of raining day during a year of 365 days

Months	Ja	Fe	Ma	Ap	Ma	Ju	Jui	Au	Se	Oc	No	De
number of days	(31)	(28)	(31)	(30)	(31)	(30)	(31)	(31)	(30)	(31)	(30)	(31)
raining days	15	11	10	7	3	2	0	0	4	8	12	19

If a day is selected randomly, what is the probability that it is a raining day knowing that it is a winter day (winter months here are supposed={December, January, February})?

1) 0.5

2) 0.6

3) 0.7