1. **TOURS:**

A travel company offers five different 9-day tours.
Each tour follows the same 6-city cycle:

Arlo → Bex → Cora → Deni → Elva → Fenn → (repeat)

Each tour starts at a different point in the cycle.

The table shows the first three days:

Tour	Day 1	Day 2	Day 3
I	Arlo	Bex	Cora
II	Bex	Cora	Deni
III	Cora	Deni	Elva
IV	Deni	Elva	Fenn
V	Elva	Fenn	Arlo

Which city does Tour II visit on Day 6?
A. Arlo
B. Bex
C. Elva
D. Fenn

Answer: (A)
Cycle length = 6 days
Tour length = 9 days

So,
Day 7 = Day 1
Day 8 = Day 2
Day 9 = Day 3

Tour II follows:
Bex → Cora → Deni → Elva → Fenn → Arlo

Day 6 = Arlo

So, the correct answer is **A Arlo**.

2. **TOURS:**

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Each tour starts at a different point in the cycle.

The table shows the first three days:

Tour	Day 1	Day 2	Day 3
I	Arlo	Bex	Cora
II	Bex	Cora	Deni
III	Cora	Deni	Elva
IV	Deni	Elva	Fenn
V	Elva	Fenn	Arlo

How many tours visit the same city more than once?

A. none
B. one
C. three
D. all five

Answer: (D)
Tour runs 9 days, but cycle is only 6 days.
So, days repeat (Day 7, 8, 9 repeat Day 1, 2, 3).
Every tour repeats cities.

So, the correct answer is **D all five**.

3. **TOURS:**

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Each tour follows the same 6-city cycle:

Arlo → Bex → Cora → Deni → Elva → Fenn → (repeat)

Each tour starts at a different point in the cycle.

The table shows the first three days:

Tour	Day 1	Day 2	Day 3
I	Arlo	Bex	Cora
II	Bex	Cora	Deni
III	Cora	Deni	Elva
IV	Deni	Elva	Fenn
V	Elva	Fenn	Arlo

On which day will Tour III next visit Cora after Day 1?
A. Day 5
B. Day 6
C. Day 7
D. Day 8

Answer: (C)
Tour III:
Day 1 = Cora

Cycle repeats every 6 days.
Therefore, next Cora = Day 1 + 6 = Day 7

So, the correct answer is **C Day 7**.

4. **TOURS:**

A travel company offers five different 9-day tours.
Each tour follows the same 6-city cycle:

Arlo → Bex → Cora → Deni → Elva → Fenn → (repeat)

Each tour starts at a different point in the cycle.

The table shows the first three days:

Tour	Day 1	Day 2	Day 3
I	Arlo	Bex	Cora
II	Bex	Cora	Deni
III	Cora	Deni	Elva
IV	Deni	Elva	Fenn
V	Elva	Fenn	Arlo

Which city is NOT visited on Day 9 by any tour?

A. Arlo
B. Bex
C. Cora
D. Fenn

Answer: (B)
Day 9 = same as Day 3

Day 3 cities:
Cora, Deni, Elva, Fenn, Arlo

Missing city = Bex

So, the correct answer is **B Bex**.

5. SNACK CARD

A student uses a snack card to buy items during the week.

Rules:

- Each snack costs $2, $6, or $9
- The student buys exactly 6 snacks
- The total weekly spending must be between $25 and $40 inclusive

If the student spends exactly $30, which statement must be true?
A. No $2 snacks were bought
B. Exactly three $6 snacks were bought
C. At least one $9 snack was bought
D. All snacks were the same price

Answer: (C)
Try:
9 + 9 = 18
Need 12 more from 4 snacks

12 can be:

6 + 2 + 2 + 2

So, combination:
9, 9, 6, 2, 2, 2

Now check options:
(A) No $2 snacks → wrong (we used three)
(B) Three $6 snacks → wrong (only one)
(C) At least one $9 snack → correct
(D) All same → wrong

So, the correct answer is **C At least one $9 snack was bought**.

6. SNACK CARD

A student uses a snack card to buy items during the week.

Rules:

- Each snack costs $2, $6, or $9
- The student buys exactly 6 snacks
- The total weekly spending must be between $25 and $40 inclusive

What is the maximum number of $9 snacks possible?
A. 2
B. 3
C. 4
D. 5

Answer: (C)
Try maximum:
5 snacks of $9 = 45 (too big)

Try 4 snacks:
4 × 9 = 36
Remaining 2 snacks must be at least 2 + 2 = 4

Total = 40 → allowed

Therefore, 4 is possible.

So, the correct answer is **C 4**.

7. SECURE LOCK

A smart lock uses a 4-digit code. Each digit can be from 0–9. Digits may be repeated unless stated otherwise.

Lucas remembers that all digits in the code are different and the first digit is not 0.

If Lucas randomly tries all such valid codes, what is the chance of guessing correctly?
A. 1 / 4536
B. 1 / 5040
C. 1 / 6480
D. 1 / 9000

Answer: (A)
All digits are different, first digit not 0.

First digit → 9 choices (1–9)
Second digit → 9 choices left
Third digit → 8 choices left
Fourth digit → 7 choices left

Total = 9 × 9 × 8 × 7 = 4536
Therefore, probability = 1 / 4536

So, the correct answer is **A 1 / 4536**.

8. SECURE LOCK

A smart lock uses a 4-digit code. Each digit can be from 0–9. Digits may be repeated unless stated otherwise.

Thomas knows that the code is a multiple of 5 (last digit must be 0 or 5), but nothing else.

What is the probability of guessing the correct code randomly?
A. 1 / 1000
B. 1 / 1500
C. 1 / 2000
D. 1 / 2500

Answer: (C)
Code is multiple of 5 (last digit = 0 or 5)

Last digit = 2 choices
First 3 digits = 10 choices each

Total = 10 × 10 × 10 × 2 = 2000
Probability = 1 / 2000

So, the correct answer is **C 1 / 2000**.

9. DATA SPEED

A system sends data using packets over a network.

Assume:

- Each packet = 6000 bits
- Packets are sent one at a time
- Initial speed = 60,000,000 bits per second
- If a packet fails, it is resent at half the previous speed each time

About how many packets can be sent per second at the initial rate?
A. 600

B. 1000
C. 10,000
D. 60,000

Answer: (C)
Speed = 60,000,000 bits/sec
Packet size = 6000 bits

Packets per second
= 60,000,000 ÷ 6000
= 10,000

So, the correct answer is **C 10,000**.

10. DATA SPEED

A system sends data using packets over a network.

Assume:

- Each packet = 6000 bits
- Packets are sent one at a time
- Initial speed = 60,000,000 bits per second
- If a packet fails, it is resent at half the previous speed each time

A 6-gigabit file is sent. (1 gigabit = 1000 million bits)

How long will it take at the initial rate?
A. 60 seconds
B. 100 seconds
C. 600 seconds
D. 1000 seconds

Answer: (B)
6 gigabits = 6 × 1000 million = 6,000,000,000 bits

Time = Total bits ÷ Speed
= 6,000,000,000 ÷ 60,000,000
= 100 seconds

So, the correct answer is **B 100 seconds**.

11. DATA SPEED

A system sends data using packets over a network.

Assume:

- Each packet = 6000 bits
- Packets are sent one at a time
- Initial speed = 60,000,000 bits per second

- If a packet fails, it is resent at half the previous speed each time

Packet X is sent successfully on the first try.
Packet Y succeeds on the fourth try.

Compared to packet X, how long did packet Y take in total?
A. 8 times
B. 10 times
C. 12 times
D. 15 times

Answer: (D)
Try 1 → time = 1 unit
Try 2 → time = 2 units
Try 3 → time = 4 units
Try 4 → time = 8 units

Total time = 1 + 2 + 4 + 8 = 15 units

Packet X = 1 unit
Therefore, Y takes 15 times longer.

So, the correct answer is **D 15 times**.

12. DATA SPEED

A system sends data using packets over a network.

Assume:
- Each packet = 6000 bits
- Packets are sent one at a time
- Initial speed = 60,000,000 bits per second
- If a packet fails, it is resent at half the previous speed each time

If the speed is reduced to half, how many packets can be sent per second?
A. 2500
B. 5000
C. 7500
D. 10,000

Answer: (B)
Original packets/sec = 10,000
Half speed → half packets = 5000

So, the correct answer is **B 5000**.

13. DATA SPEED

A system sends data using packets over a network.

Assume:

- Each packet = 6000 bits
- Packets are sent one at a time
- Initial speed = 60,000,000 bits per second
- If a packet fails, it is resent at half the previous speed each time

A packet succeeds on the second try.
How much longer did it take compared to a packet sent on the first try?

A. 3 times
B. 4 times
C. 5 times
D. 6 times

Answer: (A)
Try 1 → 1 unit
Try 2 → 2 units

Total = 1 + 2 = 3 units
First try = 1 unit
Therefore, it is 3 times longer.

So, the correct answer is **A 3 times**.

14. GREEN FEED

Scientists tested a new plant-based supplement on cows to study gas production.

- Each cow is fed one of three diets: Low, Medium, High fibre
- Each group receives no supplement, small dose, or large dose
- Each group has 8 cows
- Values shown are average grams per cow per day

Table 1: Methane Production (g per cow per day)

Supplement	Low fibre	Medium fibre	High fibre
None	180	260	300
Small	90	150	210
Large	60	100	180

Table 2: Carbon Dioxide Production (g per cow per day)

Supplement	Low fibre	Medium fibre	High fibre
None	7000	8200	9000
Small	7200	8100	8900
Large	7100	8300	8800

Which statement is true?

a. The supplement always reduces methane
b. The supplement always reduces carbon dioxide
c. Both gases always decrease
d. Neither gas ever decreases

Answer: (A)
Check methane:
All values go down as supplement increases → always decreases

Check carbon dioxide:
Sometimes increases, sometimes decreases

So, the correct answer is **A The supplement always reduces methane**.

15. GREEN FEED

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Table 2: Carbon Dioxide Production (g per cow per day)

Supplement	Low fibre	Medium fibre	High fibre
None	7000	8200	9000
Small	7200	8100	8900
Large	7100	8300	8800

For cows on a medium fibre diet with large supplements, how much methane is produced in total by the group in one week?

a. 5600 g
b. 7000 g
c. 8000 g
d. 8400 g

Answer: (A)
Medium fibre + Large supplement = 100 g per cow per day

For 8 cows:
100 × 8 = 800 g per day

For 7 days:
800 × 7 = 5600 g

So, the correct answer is **A 5600 g**.

16. GREEN FEED

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- Each group receives no supplement, small dose, or large dose
- Each group has 8 cows
- Values shown are average grams per cow per day

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Table 2: Carbon Dioxide Production (g per cow per day)

Supplement	Low fibre	Medium fibre	High fibre
None	7000	8200	9000
Small	7200	8100	8900
Large	7100	8300	8800

Which diet shows the greatest decrease in methane when comparing no supplement to large supplements?

a. Low fibre
b. Medium fibre
c. High fibre
d. Same for all

Answer: (B)
Compare decrease:
Low = 180 → 60 = 120
Medium = 260 → 100 = 160
High = 300 → 180 = 120

Therefore, largest decrease = 160 (medium fibre)

So, the correct answer is **B Medium fibre**.

17. GREEN FEED

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- Each group has 8 cows
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Table 2: Carbon Dioxide Production (g per cow per day)

Supplement	Low fibre	Medium fibre	High fibre
None	7000	8200	9000
Small	7200	8100	8900
Large	7100	8300	8800

Which statement best describes the effect of the supplement on carbon dioxide?

a. It always decreases
b. It always increases
c. It sometimes increases and sometimes decreases
d. It has no effect

Answer: (C)

Carbon dioxide:
Sometimes it increases (7000 → 7200)
Sometimes decreases (9000 → 8800)

So, the correct answer is **C It sometimes increases and sometimes decreases**.