GER 1000 quiz 6

Question 1

If you were to toss a fair coin six times, which one(s) of the following sequences would be most likely (i.e., having the largest probability) to occur?

(i) H H H H H H, (ii) H T H T H T, (iii) H H H T T T.

(H denotes a head; T denotes a tail)

(a) (ii)

(b) (i) and (ii)

(c) (ii) and (iii)

(d) All are equally likely

Answer: d

The probability of each sequence equals 0.5^6.

Question 2

You pay $10 to play the following game. The dealer rolls a fair six-sided die, so the outcome is equally likely to be 1, 2, …, 6. The payoff for each outcome is indicated in the table below.

Outcome	1	2	3	4	5	6
Payoff ($)	0	2	3	4	25	25

What is your average net gain from this game? (Rounded to the nearest cent.)

(a) -8 cents

(b) -17 cents

(c) -33 cents

(d) 12 cents

Answer: b

Average value = (1/6 * 0 + 1/6 * (2 + 3 + 4) + 2/6 * 25) – 10 = -1/6 dollars= -17 cents.

Question 3

In a quiz, there are five MCQ questions. Two of them have 4 options each, while the other three questions have 3, 5, 6 options, respectively. Suppose a student picks an option randomly for each question, and that the picks are independent of each other.

The probability that the student gets 0 marks is (or closest to):

(a) 0.15

(b) 0.20

(c) 0.25

(d) 0.40

Answer: c

The probability = 2/3 * 3/4 * 3/4 * 4/5 * 5/6 = 1/4.

Question 4

Mammograms and ultrasounds are used to test for breast cancer. In a certain country, there were 4000 women who went for both tests in 2016, and the table displays the outcomes.

	Positive ultrasound	**Negative ultrasound**
Positive mammogram	200	300
Negative mammogram	50	3450

The next two questions are about a randomly selected person from the 4000 women.

Question 4

The probability of the person having a positive mammogram is ____ .

(a) 1/20
(b) 1/16
(c) 1/8
(d) 2/5
(e) 4/5

Answer: c

Let M be the event that she has a positive mammogram.

Then P(M) = (200 + 300)/4000 = 1/8.

Question 5

Is having a positive mammogram independent from having a positive ultrasound?

(a) Yes
(b) No
(c) Cannot be determined from the given information

Answer: b

Let U be the event that she has a positive ultrasound. P(U) = (200 + 50)/4000 = 1/16.

Since P(M and U) = 200/4000 = 1/20, which is not equal to P(M) * P(U) = 1/8 * 1/16 = 1/128, we know by multiplication rule that having a positive mammogram and having a positive ultrasound are not independent events.