**CHAPTER 9: CELLULAR REPRODUCTION RFC #1B**

\* Read the following questions, **THEN** read from Chapter 8 p. 246 The Cell Cycle to p. 247, **THEN** answer the following questions on your own paper in complete sentences. ***ANSWERS ARE NOT IN ORDER, YOU MUST READ FIRST!***

1. Why and when does cellular reproduction occur?
2. How do cells reproduce?
3. Besides cell growth, what else occurs during interphase?
4. How many sub stages is mitosis **AND** what occurs during mitosis?
5. What is the process after mitosis **AND** what occurs during the process?
6. What is the duration of time for the cell cycle?
7. When does the G1 phase occur AND what occurs during the G1 phase of interphase?
8. What occurs during the S phase?
9. What is the difference between chromosomes and chromatin?
10. What occurs during the G2 phase?
11. How is prokaryotic cell division different from eukaryotic division?

**PART B: Passage II**

     A student studying how gases diffuse derived the following formula:  
http://www.actstudent.org/sampletest/science/images/science_p2_formula_01.gif  
The following experiments were conducted to test her formula and to study factors affecting the rate at which gases diffuse.

***Experiment 1***

     When hydrogen chloride (HCl) and ammonia (NH3) vapors react, they form solid ammonium chloride (NH4Cl):

HCl(g) + NH3(g) → NH4Cl(s)

A swab soaked with HCl solution was inserted into one end of a glass tube (1 cm diameter), and, simultaneously, a swab soaked with NH3 solution was inserted into the other end, so that the swabs were 10 cm apart. The distance that each vapor traveled could be determined because, at the point they made contact, a white ring of NH4Cl formed (see Figure 1). The reaction was done at different temperatures. The time it took for the ring to start to form and its distance from the HCl swab were measured for each trial (see Table 1).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 1 | | | | |
| **Trial** | **Temperature (°C)** | **Time  (sec)** | **Distance of ring from HCl swab (cm)** |  |
| 1 2 3 4 | 20 30 40 50 | 33 30 26 23 | 4.0 4.1 4.1 4.0 |  |

Using the formula, the student predicted that the distance of the ring from the HCl swab would be 4.06 cm, so the student concluded that her formula was correct.

[http://www.actstudent.org/sampletest/science/images/GID-4214_sm.gif](http://www.actstudent.org/sampletest/science/images/GID-4214.gif)

Figure 1

***Experiment 2***

   Experiment 1 was repeated, but the temperature was held constant at 20°C and the diameter of the tube was varied for each trial (see Table 2).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 2 | | | | |
| **Trial** | **Tube diameter (cm)** | **Time  (sec)** | **Distance of ring from HCl swab (cm)** |  |
| 5 6 7 8 | 1.0 1.2 1.4 1.6 | 33 33 33 33 | 4.0 4.0 4.1 4.0 |  |

***Experiment 3***

     Experiment 2 was repeated, but the diameter of the tube was kept constant at 1 cm and longer tubes were used so that the distance between the swabs could be varied for each trial (see Table 3).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Table 3 | | | | |
| **Trial** | **Distance between swabs (cm)** | **Time  (sec)** | **Distance of ring from HCl swab (cm)** |  |
| 9 10 11 12 | 10 20 30 40 | 33  67 101 133 | 4.0  8.1 12.2 16.2 |  |

1. Which of the following best describes the difference between the procedures used in Experiments 1 and 2 ? In Experiment 1, the:

[A.](http://www.actstudent.org/sampletest/science/sci_02.html#1a)temperature was varied; in Experiment 2, the diameter of the tube was varied.

[B.](http://www.actstudent.org/sampletest/science/sci_02.html#1b)diameter of the tube was varied; in Experiment 2, the temperature was varied.

[C.](http://www.actstudent.org/sampletest/science/sci_02.html#1c)distance between the swabs was varied; in Experiment 2, the temperature was varied.

[D.](http://www.actstudent.org/sampletest/science/sci_02.html#1d)temperature was varied; in Experiment 2, the distance between the swabs was varied.

1. Which of the following sets of trials in Experiments 1, 2, and 3 were conducted with identical sets of conditions?

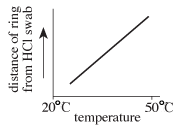
[F.](http://www.actstudent.org/sampletest/science/sci_02.html#2f)Trials 2, 3, and 4

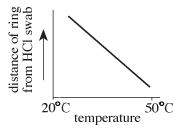
[G.](http://www.actstudent.org/sampletest/science/sci_02.html#2g)Trials 1, 5, and 9

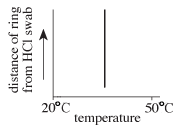
[H.](http://www.actstudent.org/sampletest/science/sci_02.html#2h)Trials 4, 7, and 9

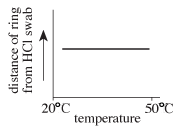
[J.](http://www.actstudent.org/sampletest/science/sci_02.html#2j)Trials 10, 11, and 12

1. Based on the results of Experiment 1, which of the following graphs best shows the relationship between the temperature and the distance of the ring from the HCl swab?

[A.](http://www.actstudent.org/sampletest/science/sci_02.html#3a)

[B.](http://www.actstudent.org/sampletest/science/sci_02.html#3b)

[C.](http://www.actstudent.org/sampletest/science/sci_02.html#3c)

[D.](http://www.actstudent.org/sampletest/science/sci_02.html#3d)

1. If a trial in Experiment 3 had been performed with the swabs 25 cm apart, the distance from the HCl swab to the ring would most likely have been closest to:

[F.](http://www.actstudent.org/sampletest/science/sci_02.html#4f) 8 cm.

[G.](http://www.actstudent.org/sampletest/science/sci_02.html#4g)10 cm.

[H.](http://www.actstudent.org/sampletest/science/sci_02.html#4h)12 cm.

[J.](http://www.actstudent.org/sampletest/science/sci_02.html#4j)14 cm.

1. If another student wanted to test a factor that was not studied in Experiments 1–3, which of the following should he do next? He should test how the diffusion rates of gases are affected by:

[A.](http://www.actstudent.org/sampletest/science/sci_02.html#5a)atmospheric pressure.

[B.](http://www.actstudent.org/sampletest/science/sci_02.html#5b)tube length.

[C.](http://www.actstudent.org/sampletest/science/sci_02.html#5c)temperature.

[D.](http://www.actstudent.org/sampletest/science/sci_02.html#5d)tube diameter.

1. The student concluded that NH3 diffuses at a greater rate than HCl. Do the results of Experiments 1–3 support her conclusion?

[F.](http://www.actstudent.org/sampletest/science/sci_02.html#6f)No; in Trials 1–9 the HCl vapors traveled farther than the NH3 vapors.

[G.](http://www.actstudent.org/sampletest/science/sci_02.html#6g)No; in Trials 1–9 the NH3 vapors traveled farther than the HCl vapors.

[H.](http://www.actstudent.org/sampletest/science/sci_02.html#6h)Yes; in Trials 1–9 the HCl vapors traveled farther than the NH3 vapors.

[J.](http://www.actstudent.org/sampletest/science/sci_02.html#6j)Yes; in Trials 1–9 the NH3 vapors traveled farther than the HCl vapors.