**Using a Microscope**

**Answer all the questions in the spaces provided.**

1. Which of the following options is the correct term for the study of cells is called:

* Histology
* Molecular biology
* Zoology
* Cytology

ANS: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. Microscopes have developed over history. Now scientists are aware of organelles. How has become possible?

ANS: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Not all sampling is successful in identifying problem cells. Which of the following is not involved in the successful identification of cells?
   * Magnification used for sample identification.
   * The wrong location for sampling.
   * Not enough of the sample.
   * Sample contamination.

ANS: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

1. What is meant by the term resolution?

ANS: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Below are three different types of microscope:

* Electron microscope (Transmission or scanning)
* Phase contrast microscope
* Light microscope

Select the ***most suitable*** type of microscope(s) from above that you would use for each of the following situations. Each microscope can be used once, more than once, or not at all.

1. Viewing live specimens?

ANS: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Viewing ribosomes?

ANS: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Viewing transparent organisms?

ANS: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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[3]

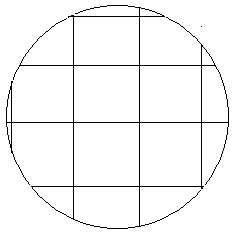
1. A microscope was borrowed from a mining laboratory to view some slides.

Complete the following table using the appropriate magnifications:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Ocular Lens | Objective Lens | Total Magnification |
| Low power |  | 100 x | 500 x |
| Medium power | 10 x | 40 x |  |
| High power | 10 x |  | 100x |

[3]

1. A student has made a slide of a piece of 1 mm graph paper and observes this with her microscope. Using an ocular lens of 10x and an objective lens of 4x, she sees the image of the graph paper shown below:

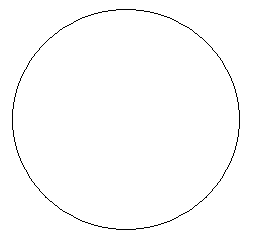


a. What was the magnification used? ANS: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [1]

b. Estimate the diameter of the field of view at this magnification:

(i) in mm: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (ii) in μm: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

Using the same microscope, the student changed the objective to 10x. Draw lines on the circle below to indicate, approximately, the new image that she would observe.



c. Estimate the diameter of the field of view on this second magnification:

(i) in mm: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (ii) in μm: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [2]

1. If, when using the second magnification later in the day, she observed an organism which she drew carefully (shown below) estimate the:

(i) length \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mm or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ μm [2]

(ii) width \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mm or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ μm [2]