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Bio 2311-OL26 Lab

Professor Haque

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Review Sheet 3

1. Label all indicated parts of the microscope.

Left side from top to bottom:

a. Rotating nosepiece
b. Stage
c. Condenser
d. Iris diaphragm lever
e. Substance light
f. Base

Right side from top to bottom:

a. Ocular lenses
b. Arm
c. Objective lenses
d. Mechanical stage
e. Condenser knob
f. Coarse adjustment knob
g. Fine adjustment knob
h. Light control

2. Explain the proper technique for transporting the microscope. You must hold it in an upright position with one hand on the arm and the other hand supporting the base.

3. Each of the following statements is either true or false. If true, write T on the answer blank. If false, correct the statement by writing on the blank the proper word or phrase to replace the one that is underlined:

False. Grit free lens paper. 1. The microscope lens may be cleaned with any soft tissue.

False. Lowest power objective. 2. The microscope should be stored with the oil immersion lens in position over the stage.

False. Lowest power. 3. When beginning to focus, use the scanning objective lens.

False. Fine adjustment. 4. When focusing on high power, always use the coarse adjustment knob to focus.

True. 5. A coverslip should always be used with wet mounts.

4. Match the microscope structures in column B with the statements in column A that identify or describe them.

I.Stage 1. platform on which the slide rests for viewing

B. Condenser 2. used to adjust the amount of light passing through the specimen

E. Mechanical stage 3. controls the movement of the slide on the stage

D. iris diaphragm lever 4. delivers a concentrated beam of light to the specimen

C. fine adjustment knob 5. used for precise focusing once initial focusing has been done

F. nosepiece 6. carries the objective lenses; rotates so that the different objective lenses

5. Define the following terms.

Total magnification: An image that is enlarged by the power of the objective lens times the power of the eyepiece.

Resolution: The smallest distances between two points on a specimen that can still be seen.

6. Complete, or respond to, the following statements:

1. The distance from the bottom of the objective lens to the surface of the slide is called the working distance.

2. Assume there is an object on the left side of the field that you want to bring to the center (that is, toward the apparent right). In what direction would you move your slide? To the left .

3. The area of the slide seen when looking through the microscope is the field.

4. If a microscope has a 103 ocular lens and the total magnification is 9503, the objective lens in use at that time is 95 X.

5. Why should the light be dimmed when looking at living (nearly transparent) cells? To increase contrast.

6. If, after focusing in low power, you need to use only the fine adjustment to focus the specimen at the higher powers, the microscope is said to be parfocal.

7. You are using a 103 ocular and a 153 objective, and the field diameter is 1.5 mm. The approximate field size with a 303 objective is .75 mm.

8. If the diameter of the low-power field is 1.5 mm, an object that occupies approximately a third of that field has an estimated diameter of .4 mm.

7. You have been asked to prepare a slide with the letter F on it (as shown below). In the circle below, draw the F as seen in the low-power field. F would be upside down and rotated 180 degrees counterclockwise.

8. Estimate the length (longest dimension) of the object in μm: length of object= 1067μm

9. Say you are observing an object in the low-power field. When you switch to high power, it is no longer in your field of view. Why might this occur? The view would become more narrow and the object would not be in the area of focus. What should you do initially to prevent this from happening? You should make sure the object is centered.

10. Do the following factors increase or decrease as one moves to higher magnifications with the microscope?

resolution: Increase

amount of light needed: Increase

working distance: Decrease

depth of field: Decrease

11. A student has the high-power lens in position and appears to be intently observing the specimen. The instructor, noting a working distance of about 1 cm, knows the student isn't actually seeing the specimen. How so? For the high- power lens, the working distance would be 1mm.

12. Describe the proper procedure for preparing a wet mount. The specimen is placed on the slide and water is added. Then, the cover slip must gently be placed on top of the water then the specimen.

13. Indicate the probable cause of the following situations during use of a microscope.

a. Only half of the field is illuminated: The light is being blocked.

b. The visible field does not change as the mechanical stage is moved: The working distance is too far.

14. + A blood smear is used to diagnose malaria. In patients with malaria, the protozoa can be found near and inside red blood cells. Explain why a microscope capable of high magnification and high resolution would be needed to diagnose malaria. The protozoa is so small that it can only be seen with high magnification.

15. + Histopathology is the use of microscopes to view tissues to diagnose and track the progression of diseases. Why are thin slices of tissue ideal for this procedure? Thin slices of tissue would make it easier for the cells of the tissue to be seen.