**Question Bank on Basics of Microscopes**

 **Multiple Choice Questions (MCQs)**

1. What is the typical magnification range of a compound microscope?

 a) 10x - 40x

 b) 100x - 2000x

 c) 40x - 1000x

 d) 200x - 400x

 Correct Answer: c) 40x - 1000x

2. Which part of the microscope is used to hold and rotate the objective lenses?

 a) Stage

 b) Arm

 c) Revolving Nosepiece

 d) Coarse Adjustment Knob

 Correct Answer: c) Revolving Nosepiece

3. Which lens is closest to the specimen in a compound microscope?

 a) Ocular Lens

 b) Objective Lens

 c) Condenser

 d) Eyepiece

 Correct Answer: b) Objective Lens

4. What is the function of the diaphragm in a microscope?

 a) Magnification

 b) Illumination

 c) Focusing

 d) Controlling light intensity

 Correct Answer: d) Controlling light intensity

5. Which type of microscope provides a 3D view of the specimen?

 a) Compound Microscope

 b) TEM

 c) SEM

 d) Fluorescence Microscope

 Correct Answer: c) SEM

6. What is the primary function of the coarse adjustment knob?

 a) Fine tuning focus

 b) Moving the stage quickly for general focus

 c) Controlling light intensity

 d) Changing magnification

 Correct Answer: b) Moving the stage quickly for general focus

7. Which microscope technique is used to visualize fluorescently labelled samples?

 a) Brightfield Microscopy

 b) Phase Contrast Microscopy

 c) Fluorescence Microscopy

 d) Darkfield Microscopy

 Correct Answer: c) Fluorescence Microscopy

8. What is the maximum magnification typically achieved by a scanning electron microscope (SEM)?

 a) 1,000x

 b) 100,000x

 c) 10,000x

 d) 300,000x

 Correct Answer: d) 300,000x

9. Which microscope part focuses light onto the specimen?

 a) Ocular Lens

 b) Objective Lens

 c) Condenser

 d) Stage

 Correct Answer: c) Condenser

10. What is the function of stage clips?

 a) Holding the slide in place

 b) Changing magnification

 c) Adjusting focus

 d) Controlling light intensity

 Correct Answer: a) Holding the slide in place

**Answer in one sentence:**

1. What part of the microscope is used to view the specimen?

 Answer: The ocular lens (eyepiece) is used to view the specimen.

2. What is the function of the revolving nosepiece in a microscope?

 Answer: The revolving nosepiece holds and rotates the objective lenses.

3. Which part of the microscope adjusts the focus for sharp images?

 Answer: The fine adjustment knob adjusts the focus for sharp images.

4. What is the role of the diaphragm in a microscope?

 Answer: The diaphragm controls the amount of light reaching the specimen.

5. Where is the light source located in a microscope?

 Answer: The light source is located beneath the stage.

6. How does a stereo microscope differ from a compound microscope?

 Answer: A stereo microscope provides a 3D view of the specimen, while a compound microscope does not.

7. Which part of the microscope supports and stabilizes the instrument?

 Answer: The base supports and stabilizes the microscope.

8. What magnification levels are typically found in objective lenses?

 Answer: Objective lenses typically have magnifications of 4x, 10x, 40x, and 100x.

9. What is the function of the condenser in a microscope?

 Answer: The condenser focuses light onto the specimen.

10. What type of microscope uses electron beams to view specimens?

 Answer: Electron microscopes, such as TEM and SEM, use electron beams to view specimens.

 **Short Answer Questions:**

1. Describe the proper procedure for using a compound microscope to view a specimen.

 Answer: Start with the lowest magnification, place the slide on the stage, and secure it with stage clips. Turn on the light source and adjust the diaphragm to control the light intensity. Use the coarse adjustment knob to bring the specimen into focus, and then finetune the focus with the fine adjustment knob. Once the specimen is in focus at low magnification, rotate the nosepiece to switch to a higher power objective lens and readjust the focus using the fine adjustment knob. Ensure the specimen is centered in the field of view using the mechanical stage controls, and document observations or capture images as needed.

2. Explain the importance of cleaning and maintaining a microscope.

 Answer: Proper cleaning and maintenance of a microscope are crucial for ensuring accurate observations and prolonging the lifespan of the instrument. Regularly clean lenses with lens paper or a soft, lintfree cloth to prevent scratches and remove dust. Wipe the body of the microscope with a damp cloth to remove dirt. Cover the microscope with a dust cover when not in use, and store it in a cool, dry place away from direct sunlight and humidity. Handle the microscope gently to avoid jarring movements that could damage delicate components, and have it serviced by a professional if necessary to ensure it remains in optimal working condition.