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MATERIALS MANAGEMENT DIVISION
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Purchase Requisition No. 1000013847 (SRM/RFX No. 6100000287)

Technical Specifications for Optical Microscope and Stereomicroscope

Item 1: Optical Microscope (including polarizing, fluorescence)

Description: Trinocular Upright microscope for reflected and transmitted light with bright field, polarization and Fluorescence contrast observation along with digital scanning camera.

Microscope stand: Upright, Frame should incorporate with built-in transformer/power supply. Illuminator intensity control shall be frame mounted.

Manual focus drive: Coarse & Fine Focus drive of total range 25 mm or more. It should have a precision of 1 micron or better.

Aperture & field diaphragm: Built-in and adjustable aperture & field diaphragms

Reflector turret: Manual rotatable 4-position turret for reflected light observations.

Objective nosepiece: Manual rotatable 6-Position (sextuple) revolving nosepiece.

Observation tube: Trinocular wide field tube with field of view of 23 mm or more with adjustable light path Selection. For observation it should have dual port for attaching two outputs (e.g. two cameras or one camera one spectrometer).

Observation technique: Bright field, dark field, reflected light, transmitted light, polarizing and fluorescence.

Illumination and light sources: High power intense white light LED or Halogen source for transmitted and reflected light. Halogen source should have a lifetime of 2,000 hours or more and in the case of LED source it should be 20,000 hours or more. In the case of halogen source, spare lamps (4 pieces) should be supplied.

Dimmer knob is must for reduce/increase the light intensity.

Appropriate converter is needed for both bright and dark field observation, when necessary.

For fluorescence pre-centred/ centre-able Mercury 100 W or 120 W light source with lifetime 2,000 hours or more.

Reflected light and fluorescence shall be attached simultaneously on the system.

Fluorescence filter cubes:

Excitation: within 340-390 nm (UV excitation)

Excitation: within 400-450 nm (Blue Violet excitation)

Excitation: within 450-500 nm (Blue excitation)

Excitation: within 520-560 nm (Green excitation)

Will be used for fluorescence imaging and should be place-able in the optical path of the microscope

Polarizer and analyser

Polarizer in slide bar/ slider polarizer, analyser rotatable. Should work at least for reflected light.

Mechanical stage: Appropriately ceramic coated scratch free mechanical stage with x-y movement of 75 x 50 mm with x-y control knob. Right hand low drive control (long type). It should be possible to use both reflected light and transmitted light samples. The z-position of the stage should be adjustable and fixable by screw. Mechanical x-y stage should be compatible and firmly fixable by suitable clamps with hot/cold stages like Linkam (THMS 600 and LTS 420), Instec (HCS 302) etc.

Objectives: All objectives should be plan Semi-Apochromat or Plan Apochromat suitable for reflected light and transmitted light observations only in brightfield. Should be suitable for fluorescence imaging. All the objectives should work in air medium (no oil immersion). Details of accepted range of numerical aperture (N.A) and working distance (W.D) are given below for each objectives of following magnifications:

5X: N.A within 0.13- 0.15; W.D within 13-24 mm

10X: N.A within 0.25- 0.35; W.D within 5.2-17.5 mm

20X: N.A within 0.4- 0.45; W.D within 4.5-12 mm

50X: N.A within 0.5- 0.6; W.D within 8-11 mm

100X: N.A within 0.75- 0.8; W.D within 3.3-4.8 mm

40X or 50X: NA: N.A within 0.9- 0.95; W.D within 0.22-0.45 mm

Eyepieces: A pair of focusable eyepieces of 10x with FOV of 23 mm or more

Item 2: Camera and Imaging software

For microscope.

Camera: 5 Mega Pixel microscopic CCD/CMOS camera. Pixel Size: 2.2 x 2.2 micron, minimum or higher. Live image displays through PC monitor, with a speed of 15 fps or more at the 5 Mega Pixel recordable capacity. Should have true colour compliance.

Imaging software – Imaging software should be provided with the microscope. It should be capable of live capturing of images. It must be able to capture series of sequential images (or stack of images sequentially) with intervals between images as less as 1 second or less. It should be compatible with PC and Windows OS. The software should be capable of doing image enhancement by adjustment of brightness, contrast etc. It should be possible to perform common measurements like distance, area, perimeter, angle etc. on captured images. Camera and software should be well synchronized and compatible. Microscope camera and software should be from same manufacturer.

Item 3: Stereomicroscope

Stereo microscope with Greenough or Cyclooptic optical system. Must be operated in reflection mode. Transmission mode is optional.

Zoom ratio should be any one of these: 6.7:1 (0.67x-4.5x), 5:1 (0.8x-4x), 7.5:1 (0.67x-5x), 4.4:1 (0.8x-3.5x) or 4.4:1 (1.28x-5.6x)

Additionally, 10X eyepiece with FOV 20 mm or higher needed.

Objective shall permit working distance of at least 100 mm (or higher).

White LED light for reflected/transmitted illumination with knob to control illumination.

3-5 MP CMOS or CCD digital camera along with appropriate interface (e.g. USB) to connect to PC. Software to be provided for image capture having live acquisition possibility. Camera and software should be well synchronized and compatible.

Other terms and conditions

- Free installation at user site and training by experts. General maintenance troubleshooting of the microscope during warranty period.
- Vendor must have an installation of specified offered system within India which is working satisfactorily.
- If necessary, the offered system need to be shown as a live demonstration, when called for, being the qualifying criteria.
- Imported items should be quoted in foreign currency.