medical lab. techniques(practical)

lab; 1

The microscope

an optical instrument that uses a lens or a combination to produce magnified images of small objects especially of objects too small to can't be seen by the unaided eye.

A compound microscope could be divided into four parts :-

First: Mechanical parts:

a) Base :- Which is a firm, horse – shaped foot which the microscope rests

.b) Arm :- Which is the handle by which the microscope can be carried without any damage .

c) Mechanical stage :- Which is the horizontal shelf on which object being examined is placed.:-

e) Body tube :- it is part of the microscope through which light passes to the eyepiece.

f) Coarse adjustment :- That gives rapid movement over wide range and is used to obtain an approximate focusing .

g) Fine adjustment :- That gives very slow movement over limited range and is used to get exact focusing .

Second: optical parts

1) Eyepiece :- it is the lens that magnifies the image formed by the objectives. the usual magnification is (x10) , although (x5) and (monocular) , while most new microscopes have two eyepieces(binocular) .

2) Nosepiece(Revolving piece):- to increase magnification

*** The objectives :- are the major part of the magnification system.**

These are usually either 3 or 4 objectives could be revolved :-

1 Very low power (x4) 2 Low power (x10) 3 High power (x40)

4 Oil immersion (x100) :-**It gives a magnification of hundred times, when immersion oil fills the space between the object and the objective.**

3)Condenser: Gathers and focuses light from the illuminator onto the specimen being viewed.

4) Illumination: The light source for a microscope.

Older microscopes used mirrors to reflect light from an external source up through the bottom of the stag.

a) Power supply :- Usually mains 220 volts .

b) Transformer :- Used to convert 220 volts to 12volts or 6volts .

c) Rheostat (Variable voltmeter) :- Used to give control over the intensity of light .

d) Light bulb 1- Tungsten lamp :- 12 volts , short duration .

2- Halogen lamp :- 12 volts , long duration .

The light source is located at the base of the microscope, and the light is direct up through the condenser system.

<u>Care and cleaning of the microscope</u> :-

The microscope is precision instrument and must be handle with great care

A-when It is necessary to transport the microscope :

1-it should always be carried with both hands. it should be carried by the arm and supported under the base

B-When not in use the microscope should be covered and put away in a microscope case, on in a desk or cupboard, it should be left with the low power (x10) objective in place, the body tube adjusted to the lowest po ssible position , and the condenser down.

C-The surface of most microscopes is finished with a black or gray enamel and metal plating that is resistance to most laboratory chemicals, it may be kept clean by washing with soap and water, to clean the metal or enamel

D-Agauze or soft cloth should be moistened with the cleaning agent and rubbed over the surface with a circular motion, the surface should be dried immediately with a clean, dry piece of gauze or cloth. gauze should never be used to clean any of the optical parts of the microscope

E-The eyepiece and objective lenses and condenser lenses and the sensitive parts of the microscope, these lenses must be kept always clean, Optical glass is softer than ordinary glass and should never be cleaned with paper tissue or gauze, these materials will scratch the lens,

to clean the lenses of the microscope use lens paper.
Oil must be removed from the oil immersion (x100) objective immediately after use by wiping with a clean lens paper.

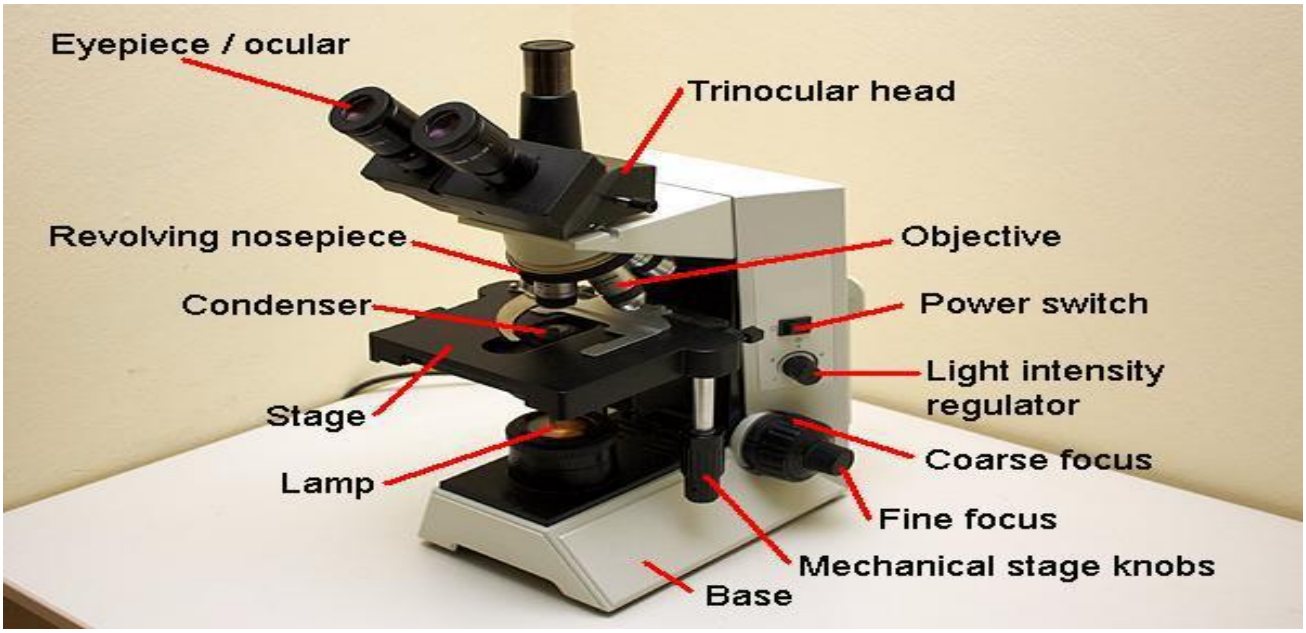
If not removed:
oil may seep inside the lens, or dry on the outside surface of the objective, the high dry (x40) objective should never be used with oil, however if this or other objective common in to contact with oil, should be cleaned immediately, if a

lens is specially dirty it may be cleaned with small amount of xylene (xylol)

cleaner applied to the lens paper if it is allowed to get beyond the front seal, to

property use the oil immersion lens cleaner, a small amount of xylene should

be used on the lens paper, When lens cleaner is used, the lenses should never be touched with the fingers, dirt on any part of the eyepiece will rotate when it

is turned , the eyepiece should not be removed for more than a few minutes as

dust can collect in the body tube and settle on the rear lens of the objective .