MEDICAL INSTRUMENTS-II

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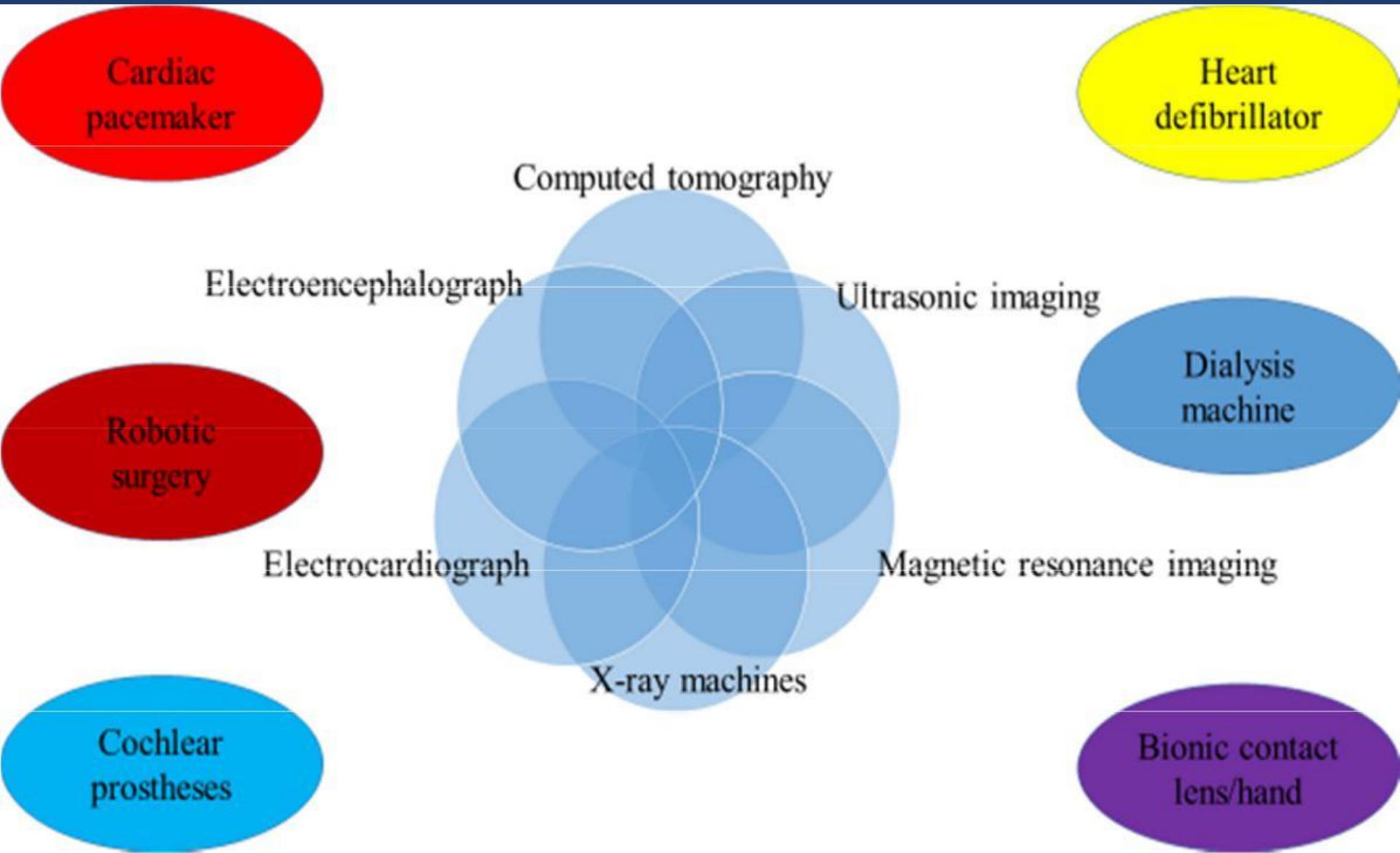
TOTAL MARKS = 100 (having Theory Section only)

THEORY (100 marks)	
Question	**Marks for each Questions**
Question 01: MCQs (20 stems with 04 possible options only 01 correct)	01x20 = 20
Question 02: SEQs (08 stems Requiring short answer of all)	08x05 = 40
Question 03-05: LEQs (Requiring detailed answer of any 02 Qs)	02x15 = 30
Total Marks	**90**
INTERNAL ASSESSMENT (10 MARKS)	
Internal assessment Theory part	10
Total Marks	10
Grand Total Marks	**100**

Contributions of biomedical science, engineering and technology to equipment's and devices for clinical diagnosis, treatment, and rehabilitation practice



MEDICAL INSTRUMENTATION-II

MICROTOMY

Microtomy:

- Is the means by which tissue can be sectioned (cut) and attached to a surface (usually glass slide) for further microscopic examination.

Microtome:

- Basic instrument used in microtomy.
- Microtome is a mechanical device used for cutting biological specimens (biopsy) in to very thin uniform slices for microscopic study.
- First microtome invented by Hiss.

Microtome

- Machines that cut extremely thin sections from a sample for applications in histology or pathology
- Use special metal, glass or diamond blades, depending on the type of specimen and the desired thickness.
- Consists of a blade holding unit with a blade holder and clamps, an advancing mechanism, and a mechanism for adjusting section thickness.

Classes of microtomes

- There are 5 basic types of microtomes named according to the mechanism-
  - Rocking microtome
  - Rotary microtome
  - Base sledge microtome
  - Sliding microtome
  - Microtomes for frozen sections:
    - Freezing microtome.
    - Cryostat
  - Ultramicrotome

Rocking microtome

Rocking microtome:

- The Rocking microtome was invented in 1881 by Caldwell and Threlfall and improved on by Charles Darwin in 1985.
- Now it is manufactured by Cambridge and Baker.
- This microtome derives its name from the rocking action of the cross arm.
- Oldest in design, cheap , simple to use.
- Extremely reliable.
- Very minimum maintenance.

Mechanism of action:

- Knife is fixed, the block of the tissue moves through an arc to strike the knife.
- Between strokes the block is moved towards the knife for the required thickness of sections by means of a ratchet operated micrometer thread.
- Steady of the handle gives ribbons of good sections.

Rocking microtome:

Components

1. Knife clamps
2. Block holder
3. Tension adjustment
4. Microtome adjustment screw
5. Operating handle
6. Feed mechanism

Advantages:

1. Excellent for serial sectioning (60 to 90 sections ribbon)
2. Very small blocks can be cut
3. The instrument is cheap, reliable and easy to maintain

Disadvantages:

- Size of the block that can be cut is limited.
- Does not give flat sections because of the rocking movement sections are cut in a curved plane.
- Light weight, therefore, cutting hard tissues may give vibrations, thus it is advisable to fit it with screwed to the bench , to avoid movement during cutting.