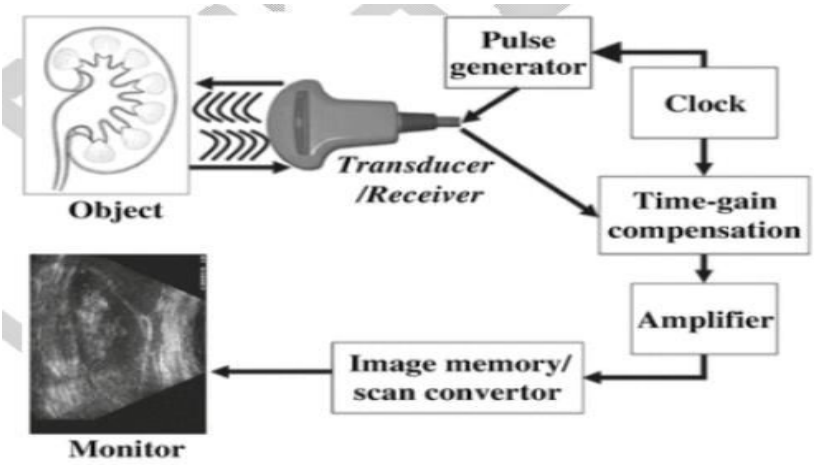
1. Explain the working principle of ultrasonography and discuss its advantages and limitations in medical imaging.

answer :

Ultrasonography is a non-invasive imaging technique that is commonly used in obstetrics and gynaecology, cardiology, and other medical specialties to diagnose and monitor a variety of conditions.

working principle :



The working of ultrasonography involves the following steps:

- Sound wave generation: The transducer emits high-frequency sound waves into the body.

• Sound wave reflection: The sound waves bounce off the internal organs and tissues, creating echoes that are detected by the transducer.

• Reception of echoes: The transducer detects the echoes and sends them to the signal processor.

• Image creation: The signal processor uses the information from the echoes to create a two-dimensional or three-dimensional image of the internal structures, which is displayed on the monitor.

Procedure of ultrasonography to capture organs image:

1.Gel is applied to the skin over the area being imaged to help transmit the sound waves.

2. The transducer is placed on the skin and moved over the area being imaged.

3. The transducer emits sound waves that penetrate the body and bounce back off of internal structures.

4. The echoes created by the bouncing sound waves are detected by the transducer and sent to a computer.

5. The computer analyses the data and creates an image that can be viewed by the healthcare provider.

advantages :

- Ultrasound is widely available, easy to use, and less expensive than most other imaging methods.
- Ultrasound imaging is extremely safe and does not use radiation.
- Ultrasound scanning gives a clear picture of soft tissues that do not show up well on x-ray images.

limitations :

- Sound waves don't travel well through air or bone, so ultrasound isn't effective at imaging body

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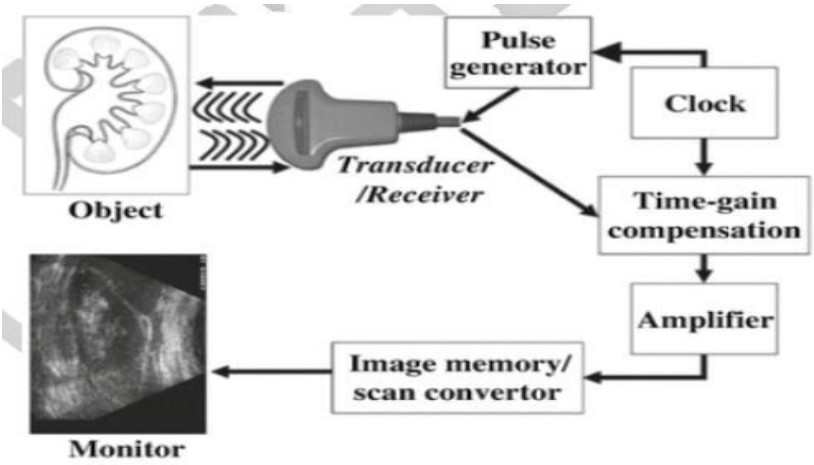

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