

NAME: EME UBANI EMMANUEL

DEPARTMENT: COMPUTER ENGINEERING

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1. Explain briefly the Signal processing and interfacing techniques in measuring instruments

ANS:

SIGNAL PROCESSING :

Measurement system requires frequency to be estimated using digital signal processing techniques. These frequency measurement methods are to be implemented using a digital

signal processor or a microcontroller. This paper presents a comparison of different

frequency measurement methods by signal processing techniques. Simulation results show the accuracy of frequency measurement by various techniques.

Taking for example a sensor as a measuring instrument. Signal processing is an electrical engineering subfield that focuses on analysing, modifying, and synthesizing signals such as sound, images, and scientific measurements.

CATEGORIES OF SIGNAL PROCESSING

- ANALOG.
- CONTINUOUS AND DISCRETE TIME.
- DIGITAL.
- NON Linear.

2. Explain briefly the expert system instrumentation

ANS: an expert system is a computer system emulating the decision-making ability of a human expert. Expert systems are designed to solve complex problems by reasoning through bodies of knowledge.

Expert systems represent one of the most advanced facts of information technology That is, they aid people in some of the most complex and least understood human information handling tasks, i.e., decision making, problem solving, diagnosis and learning. They do this by storing a large amount of factual information on a susubject area, together with lines of reasoning employed by human experts in that area.

Most of this material is supplied to the program at the time it is written, but it all has facilities for adding to this base of information as it is applied in new situations.

Components of Expert Systems

- Knowledge Base: Knowledge is required to exhibit intelligence. The success of any ES majorly depends upon the collection of highly accurate and precise knowledge
- Inference Engine: Use of efficient procedures and rules by the Inference Engine is

essential in deducting a correct, flawless solution. In case of knowledge-based ES, the Inference Engine acquires and manipulates the knowledge from the knowledge base to arrive at a particular solution.

- User Interface: User interface provides interaction between user of the ES and the ES itself. It is generally Natural Language Processing so as to be used by the user who is well-versed in the task domain. The user of the ES need not be necessarily an expert in Artificial Intelligence.