

BITS PILANI  
DUBAI INTERNATIONAL ACADEMIC CITY  
IV Year EEE&EIE – II Semester 2008-09  
Comprehensive Examination  
MEDICAL INSTRUMENTATION  
EEE C432/INSTR C481

Date: 25/5/09  
Max. Marks: 40

Time: 3 Hrs  
Weightage: 40%

---

Answer ALL Questions

1. You are employed by a hospital research unit on a project to measure the blood flow in the femoral artery of an anesthetized dog lying on an operating table. Suggest an instrumentation system to ensure that the measurement is accurate. (8M)
  
2. (a) Differentiate between A scan, M scan and B scan displays. (3M)  
(b) Discuss any TWO measurements from the nervous system. (5M)
  
3. (i) Differentiate between Galvanic skin response (GSR) and Basal skin resistance (BSR) (2M)  
(ii) Show the block diagram to measure them simultaneously and explain its working. (5M)  
(iii) Where are these measurement used. (1M)
  
4. Explain how FOUR physiological parameters can be monitored and telemetered simultaneously. Show the block diagram of the entire telemetry system. (8M)
  
5. (a) Explain how Systemic body temperature and Skin temperature measurements are performed. (3M)  
(b) Design the cardiology department of a small hospital showing the facilities ICU, surgery and diagnostics. Specify all the equipment necessary. (5M)

BITS PILANI  
DUBAI INTERNATIONAL ACADEMIC CITY  
IV Year EEE&EIE – II Semester 2008-09  
TEST2 (Open Book)  
MEDICAL INSTRUMENTATION  
EEE C432/INSTR C481

Date: 26/4/09  
Max. Marks: 20

Time: 50mts  
Weightage: 20%

---

Answer ALL Questions

1. Explain any TWO transducers for direct measurement of blood pressure. (5M)
  
2. Discuss a method of measuring cardiac output by thermal dilution method.  
Discuss the design. (5M)
  
3. A person has complete heart block. Discuss the requirements of the  
pacemaker needed and its specifications. (5M)
  
4. Design the block diagram of an electronic Spiro meter. (5M)

BITS PILANI  
DUBAI INTERNATIONAL ACADEMIC CITY  
IV Year EEE&EIE – II Semester 2008-09  
TEST1  
MEDICAL INSTRUMENTATION  
EEE C432/INSTR C481

Date: 15/3/09  
Max. Marks: 25

Time: 50mts  
Weightage: 25%

---

Answer ALL Questions

1. Suggest the block diagram of an instrument which can measure displacement, velocity and acceleration simultaneously and display /record them. (5M)
  
2. (a) Briefly explain what is EMG. (2M)  
(b) Describe the various electrodes used for recording ECG. (3M)
  
3. (a) Show the ECG wave and give the normal values for amplitudes and durations of the ECG. (2M)  
(b) Explain the various lead configurations used in recording ECG. (3M)
  
4. Show the block diagram of an ECG machine and explain the same. (5M)
  
5. Discuss the design of a frequency analyzer for automatic analysis of ECG, EEG and EMG waves. (5M)

Name:

ID No:

BITS PILANI  
DUBAI INTERNATIONAL ACADEMIC CITY  
IV Year EEE&EIE – II Semester 2008-09  
QUIZ 3  
MEDICAL INSTRUMENTATION  
EEE C432/INSTR C481

Date:

Max. Marks: 10

Time: 15mts

Weightage: 5%

---

Answer ALL Questions

1. The number of parameters monitored must be carefully weighed against \_\_\_\_\_ , \_\_\_\_\_.
2. Name any FOUR components in a cardiac care unit.
3. What are the problems in continuous monitoring of patients.
4. Name the Two types of CRT's used in patient monitoring systems.
5. The ability of the trace to remain visible on a CRT is known as \_\_\_\_\_.

6. Each signal conditioner has two sub modules. What are they.

7. What is the difference between ICU and ICCU.

8. What is a pacemaker system

9. What are the different pacing modes.

10. Draw the defibrillator discharge waveform.

Name:

ID No:

BITS PILANI  
DUBAI INTERNATIONAL ACADEMIC CITY  
IV Year EEE&EIE – II Semester 2008-09

QUIZ 2

MEDICAL INSTRUMENTATION

EEE C432/INSTR C481

Date:

Max. Marks: 10

Time: 15mts

Weightage: 5%

---

Answer ALL Questions

1. A slower heart rate is called \_\_\_\_\_.
2. Name the different ECG lead configurations.
3. Name any TWO types of ECG recorders.
4. Sphygmomanometer measures \_\_\_\_\_.
5. The pressure indicated on the manometer when the first sound is heard is \_\_\_\_\_ blood pressure.

6. The systolic and diastolic pressures in a normal person are \_\_\_\_\_.
7. Name any Two methods of direct measurement of blood pressure.
8. Name any TWO principles of measurement of blood pressure.
9. Show the waveform of the current used in magnetic blood flow meters.
10. Show the diagram of ultrasonic blood flow meter Doppler type.

Name:

ID No:

BITS, PILANI-DUBAI  
DUBAI INTERNATIONAL ACADEMIC CITY  
IV Year EEE&EIE – II Semester 2008-09

QUIZ 1

MEDICAL INSTRUMENTATION-EEE C432 INSTR C481

Date:  
Max. Marks: 10

Time: 15mts  
Weightage: 5%

---

Answer ALL Questions

1. List any FOUR errors that should be considered during a measurement.
2. Name TWO factors that add to the difficulty of obtaining valid medical measurements.
3. Biomedical instrumentation can be classified in to TWO major types. What are they.
4. Name two transducers by which Force is measured.
5. A cell in the resting state is said to be \_\_\_\_\_ and has a potential ranging from \_\_\_\_\_.



