

GANPAT UNIVERSITY
B.TECH SEM. VI BIOMEDICAL & INSTRUMENTATION ENGINEERING
CBCS REGULAR EXAMINATION April - June 2015
2BM603: DIAGNOSTIC TECHNIQUES & INSTRUMENTATION

Time: 3 hour

Marks: 70

INSTRUCTION:

1. Write each section in separate answer books.
2. All questions are compulsory.
3. Draw figures & circuits, write equations and assume data wherever necessary.
4. Conventional terms / notations are used.
5. Figure to the right indicate marks.

Section – I

Q.1

- a) What is the principle of electromagnetic blood flow meter? Explain the relationship of various parameters by mathematical expression. [12]
- b) Define: i) Tidal Volume ii) Residual Volume
Draw the schematic arrangement of wedge spirometer and explain in detail.

OR

Q.1

- a) Differentiate sine wave and square wave flow meter. Draw the block diagram of square wave flow meter. [12]
- b) What is PCG? Explain in detail.

Q.2

- a) Explain turbine type pneumotechometer in detail. [11]
- b) Which type of sensor is used in thermal conductivity gas analyzer? Draw and explain the circuit diagram of thermal conductivity gas analyzer.

OR

Q.2

- a) What is the principle of IR gas analyzer? Explain in detail. [11]
- b) What is cardiocograph? Enlist the different methods for measurement of foetal heart rate. Explain any one in detail.

Q.3

- a) What is the frequency range of ultrasound? Which type of material is used for generate ultrasound? Explain ultrasonic spirometer in detail. [12]
- b) Define "Cardiac output". Enlist the different methods used for measurement of cardiac output and explain any one in detail.

Section – II

Q.4

- a) Enlist and explain different types of hearing aids with its advantages and disadvantages. Which kinds of features are incorporated in these aids?
- b) Draw block diagram of bed side patient monitoring system and explain each block with list of parameters to be measured.

[12]

OR

Q.4

- a) State the principle on which applanation tonometry works? Define indentation tonometer? Explain non-contact type tonometer with figure?
- b) Differentiate between direct and indirect ophthalmoscope. Draw a neat diagram and explain direct ophthalmoscope.

[12]

Q.5

- a) Why glucose in blood is tested? Explain the reflectance photometric technique of measurement in detail with chemical equations?
- b) Explain evoked response audiometer with the help of block diagram with its applications.

[11]

OR

Q.5

- a) Describe technique of measuring blood pressure and blood flow in implantable telemetry system using block diagram.
- b) Draw block-diagram and explain single channel ECG telemetry system with its applications. What are the requirements for its distortion free transmission

[11]

Q.6 Write short note on (Any three)

- a) Effects of electric current on human body with macro-shock and micro-shock hazards
- b) Pulse rate measurement system
- c) Oscillometric measurement of blood pressure
- d) Direct Gonioscopy

[12]

-----END OF PAPER-----