

GANPAT UNIVERSITY**B. Tech. Semester: VI Biomedical & Instrumentation Engineering****CBCS Regular Examination April – June 2016****2BM603 Diagnostic Techniques & Instrumentation****Time: 3 Hours****Total Marks: 70**

- Instruction:**
1. This Question paper has two sections. Attempt each section in separate answer book.
 2. Figures on right indicate marks.
 3. Be precise and to the point in answering the descriptive questions.

Section - I

- | | | |
|---------------|---|-----------|
| Que.-1 | | 12 |
| | (a) Is Electromagnetic Blood Flowmeter is invasive method? Give the operating principle of Electromagnetic Blood Flowmeter and derive the relation between induced voltage and blood flow | 06 |
| | (b) Derive the relationship between flow velocity and change in frequency for ultrasonic spirometer with diagram. | 06 |
| OR | | |
| Que.-1 | | 12 |
| | (a) How the blood flow measurement through the Doppler imaging is different than other techniques? With diagram explain Doppler imaging system for blood flow measurement. | 06 |
| | (b) Draw the schematic diagram of spirometer of volume measurement and explain in detail how the measurement has done. | 06 |
| Que.-2 | | 11 |
| | (a) What is the need of wireless Biotelemetry system? With diagram explain the transmitter and receiver used in wireless Biotelemetry system. | 06 |
| | (b) Draw and explain the mechanism of hearing. | 05 |
| OR | | |
| Que.-2 | | 11 |
| | (a) What is multi-channel wireless telemetry system? With diagram explain ECG and respiration multi-channel telemetry system. | 05 |
| | (b) Draw and indicate all volumes and capacities of lung and define any three volumes and capacities. | 06 |
| Que.-3 | | 12 |
| | (a) Write short note on Infrared Gas Analyzer | 04 |
| | (b) Write the problems associated with Sine Wave Electromagnetic Blood flowmeter. Also give their remedial solutions. | 04 |
| | (c) Give advantages of implantable telemetry system over other telemetry systems. Explain implantable telemetry system for blood pressure and blood flow | 04 |

Section – II

- Que.- 4 12
- (a) Which type of dye is used for measurement of cardiac output in dye dilution method? Explain dye dilution method in detail. 04
- (b) Explain the measurement of cardiac output from aortic pressure waveform. 04
- (c) Which instrument is used for measurement of heart sound? Explain in detail. 04

OR

- Que.- 4 12
- (a) Comment on a dilution curve in open loop mode and close loop mode for indicator dilution method. 04
- (b) Write Short note on: 08
- i) Photo Plethysmography
- ii) Cardiotocogram

- Que.- 5 11
- (a) If the menomeric blood pressure reading is not taken at heart level. It is above or below the heart level. 02
How it can be compensated? Calculate the compensating factor.
- (b) What is the use of tonometer? Explain non-contact method in detail. 04
- (c) Explain the principle of blood pressure measurement based on korotkoff sound. 05

OR

- Que.- 5 11
- (a) What is ophthalmoscopy? 02
- (b) What are the effects of electric current on human body? 04
- (c) Explain foetal heart rate measurement using ultrasonic Doppler method. 05

- Que.- 6 12
- (a) Answer in short: 05
- i) Which transducer is used for monitoring labor activity?
- ii) What is the meaning of mm hg?
- iii) What is the use of manual BP push button in bio monitor?
- iv) Which solution is used for the measurement of cardiac output in thermal dilution method?
- v) Which are the different types of leakage current?
- (b) Explain the Rheographic method for blood pressure measurement. 03
- (c) Explain thermal dilution method for cardiac output measurement. 04

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