17545

11819

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions : *(1)* ***All*** *questions are* ***compulsory****. .*
(2) Illustrate your answers with ***neat*** *sketches* ***wherever*** *necessary.*
(3) Figures to the ***right*** *indicate* ***full*** *marks.*
(4) Assume suitable data, if ***necessary****.*
(5) ***Use*** *of Non-programmable Electronic Pocket Calculator is permissible.*
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. A) Attempt **any three** : **12**

a) Define the term "blood pressure". Draw the block diagram of sphygmomanometer.

b) Draw a labelled block diagram of pulse oximeter and state the function of each block.

c) Illustrate following methods to measure the heart rate :

i) Average ii) Bit to bit.

d) Draw and explain Wilson's network in ECG machine.

B) Attempt **any one** : **6**

a) State and explain generation of ECG signal and list any four technical specifications of ECG machine.

b) Write possible faults of EEG machine and write their possible solutions (any three).

2. Attempt **any four** : **16**

a) Describe direct blood pressure measurement with neat diagram.

b) List the technical specifications of heart rate meter (any four).

c) Give the importance of tone generator, noise generator, headphone and bone vibrator in pure tone audiometer.

d) State and explain vectocardiography.

e) Describe motor and sensory nerve conduction in EMG machine.

f) Draw and explain block diagram of phonocardiograph.

P.T.O.

Marks

3. Attempt **any four** : **16**

a) Compare direct and indirect blood pressure measurements (any two points of each).

b) Draw and explain block diagram of ultrasonic FHR meter.

c) List any four technical specifications of EEG machine.

d) Compare ECG and PCG (any two points of each).

e) With the help of block diagram, explain working of ECG machine.

4. A) Attempt **any three** : **12**

a) State any one application of spirometer and list any three lung volume and capacity.

b) List any four technical specifications of audiometer.

c) With neat labelled sketch, describe lead configuration which can be obtained using limb electrode in ECG.

d) State and explain generation of EMG signal.

B) Attempt **any one** : **6**

a) Mention any six faults that may occur in ECG machine and state its solution.

b) How EEG signal can be generated ? Describe EEG spectrum.

5. Attempt **any four** : **16**

a) Draw the circuit of digital temperature indicator and describe its operation.

b) Draw and explain block diagram of respiration rate meter.

c) Draw the block diagram and explain principle of operation of GSR meter.

d) How four sounds are produced during one complete cardiac cycle ?

e) List any four technical specifications of respiration rate meter.

f) Explain recording technique of EMG machine.

6. Attempt **any four** : **16**

a) Draw and explain right leg drive circuit of ECG machine.

b) Draw the block diagram of puretone audiometer.

c) Explain systemic and skin temperature.

d) State any four front panel controls of EMG machine and state their function.

e) Explain air conduction and bone conduction in hearing mechanism.