



SB-3770

**M. Sc. (Tech) (Instrumentation) (Part - I)
(Sem - II) Examination**

March / April - 2011

**Paper - INS - 24 - Biomedical & Environmental
Instrumentation
(New Course)**

Time : 3 Hours]

[Total Marks : 70

Instructions :

(1)

नीचे दशांशिक निशानावाणी विगतो उत्तरवही पर अवश्य लक्ष्मी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="M. SC. (TECH) (INSTRUMENTATION) (PART - I) (SEM - II)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="PAPER - INS - 24 - BIOMEDICAL & ENVIRONMENTAL INSTRUMENTATION"/>	<input type="text"/>
Subject Code No. : <input type="text" value="3"/> <input type="text" value="7"/> <input type="text" value="7"/> <input type="text" value="0"/>	<input type="text"/>
Section No. (1, 2,.....) : <input type="text" value="Nil"/>	<input type="text"/>
	Student's Signature

- (2) All questions carry **equal** marks.
(3) Figures to the **right** indicate full marks.
(4) Assume necessary data if required.

1 Answer the following questions : 16

- (i) What is pacemaker ?
- (ii) What is primary and secondary transducer ?
- (iii) Distinguish the term precision and sensitivity.
- (iv) What is defibrillation ?
- (v) Mention some advantages of electrical transducer.
- (vi) List five physiological parameters other than ECG and heart rate that might be measured in an ICU ?
- (vii) What is isokinetic sampling ?
- (viii) What is pH meter ?

2 Answer any **three** questions of the following : 18

- (i) Explain the static and dynamic characteristics of measurement system.
- (ii) Draw and explain optical arrangement for measurement of turbidity of water.

- (iii) A 0-150 V voltmeter has a guaranteed accuracy of a 1% of full scale reading. The voltmeter measured by this instrument is 75 V. Calculate the limiting error in % and comment upon the result.
- (iv) Explain the null detector type pH meter.

3 Answer any **three** of the following questions : **18**

- (i) Discuss in detail direct method of blood pressure measurement.
- (ii) Explain in brief :
 - (a) Systolic blood pressure
 - (b) Diastolic blood pressure
- (iii) What is EEG ? Draw and explain the block diagram of EEG.
- (iv) The emitted radiant energy from a piece of metal is measured and the temperature is found to be 1065°C. Assuming a surface emission of 0.82 it was later found out that the true emissivity is 0.75. Calculate the error in temperature.

4 Answer any **three** questions of the following : **18**

- (i) Explain in detail 10-20 lead system in EEG.
- (ii) What are the different modes of cardiac pacemaker and explain in brief.
- (iii) Describe in detail standard head configuration of ECG with Einthovens explanation.
- (iv) The output of an LVDT is connected to a 5 V voltmeter through an amplifier whose amplification factor is 250 and output of 2 mV appears the terminal of LVDT when the core moves through a distance of 0.5 mm. Calculate the sensitivity of LVDT and the whole set up. The millivoltmeter scale has 100 division, the scale can be read of 1/5 of a division. Calculate the resolution of the instrument in mm.