SE /IV / Biomed- Sem IV (CBGS)/19/5/14.

TSMA

Sub: Transducers and Sensors QP Code : NP-19688

for Medical Application [Total Marks : 80

(3 Hours)

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N. B. : (1) Question No. 1 is compulsory.
(2) Attempt any **three** questions out of remaining **five** questions.
(3) **Figures** to the **right** indicate **full** marks.
(4) Assume suitable data if necessary, stating your assumption.

1. Attempt any **four** :–
   (a) Explain Accuracy and resolution   5
   (b) Explain with a neat diagram any one application of piezoelectric transducer   5
   (c) Explain Electrode Electrolyte Interface   5
   (d) Explain with diagram ISFET's   5
   (e) What is Biosensor and give classifications of Biosensor.   5

2. (a) Explain generalised instrumentation system with the help of Block diagram   10
   (b) Explain construction and working principle of LVDT   10

3. (a) Explain basic principle of strain gauge. Derive the equation for gauge factor   10
   (b) Explain with neat sketches the laws governing thermocouples. State it's advantages   10
       and applications

4. (a) Explain in detail two types of microelectrodes with suitable diagram   10
   (b) Draw and explain electrical equivalent circuit of electrode-skin interface.   10

5. (a) Differntiate between amperometric and potentiometric sensors. Explain example   12
       of amperometric sensors.
   (b) Explain transcutaneous measurement of Arterial oxygen tension.   8

6. (a) Explain the term immunosensor. Explain with a neat diagram working of any one   10
       immunosensor
   (b) Write short note on RTD   5
   (c) Explain in detail Affinity sensors   5

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