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SE/IV / Biomed - Sem IV (CBUS) / 19/5/14.
T S M A

Sub: Transducers and Sensors QP Code : NP-19688
for Medical Application (3 Hours) Total Marks : 80

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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 :-
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| (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 |
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| 2. (a) Explain generalised instrumentation system with the help of Block diagram | 10 |
| (b) Explain construction and working principle of LVDT | 10 |
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| 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 and applications | 10 |
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| 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 |
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| 5. (a) Differentiate between amperometric and potentiometric sensors. Explain example of amperometric sensors. | 12 |
| (b) Explain transcutaneous measurement of Arterial oxygen tension. | 8 |
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| 6. (a) Explain the term immunosensor. Explain with a neat diagram working of any one immunosensor | 10 |
| (b) Write short note on RTD | 5 |
| (c) Explain in detail Affinity sensors | 5 |

Con. 10143-14.