GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, December – 2020

(Fifth Semester)

BEIOE 5051 – PROCESS INSTRUMENTATION

(Biotechnology)

Time: 2 hrs   Maximum: 50 Marks

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions)   **(1 x 10 = 10 Marks)**

Q.1. Answer *ALL* questions

a. A measuring system consists of
   (i) Sensors   (ii) Variable conversion elements
   (iii) Signal processing elements   (iv) All of these

b. The desirable static characteristics of a measuring system are
   (i) Accuracy and resproducibility   (ii) Accuracy, sensitivity and reproducibility
   (iii) Drift and dead zone   (iv) Static error

c. Which of the following conversions take place in float element?
   (i) Level to force   (ii) Level to voltage
   (iii) Level to displacement   (iv) None of the mentioned

d. Which of the following flow-measuring elements is inherently linear and requires no signal characterization (e.g. sqaure-root extraction) anywhere in the loop?
   (i) Target   (ii) Venturi
   (iii) Orifice plate   (iv) Turbine

e. Which of the following is detected using manometer devices?
   (i) Pressure difference between manometric and measuring liquid   (ii) pH difference between manometric and measuring liquid
   (iii) Density difference between manometric and measuring liquid   (iv) None of the mentioned

f. Output of a bimetallic element will be
   (i) Strain   (ii) Pressure
   (iii) Displacement   (iv) Voltage

g. Which of the following uses displacement to pressure conversion?
   (i) Flapper nozzle system   (ii) Gyroscope
   (iii) Viscometer   (iv) None of the mentioned

h. Mass spectrometers are used to determine which of the following?
   (i) Concentration of elements in sample   (ii) Composition in sample
   (iii) Relative mass of atoms   (iv) Properties of sample

i. Which of the following is the principle of Atomic Absorption Spectroscopy?
   (i) Radiation is absorbed by non-excited atoms in vapour state and are excited to higher states   (ii) Medium absorbs radiation and transmitted radiation is measured
   (iii) Colour is measured   (iv) Colour is simply observed

j.   Atomic absorption spectroscopy is also called as Absorption Flame Photometry.
   (i) True   (ii) False
   (iii) Both   (iv) none of the above

PART – B: (Short Answer Questions)　　　　　　**(2 x 5 = 10 Marks)**

Q.2. Answer *ALL* questions

a. What is level? List types of level measurement methods?

b. State Archimedes' principle?

c. Write the function of primary elements? List them?

d. Define absolute pressure and vacuum pressure?

e. State the function of mass spectroscopy?

PART – C: (Long Answer Questions)　　　　　　**(6 x 5 = 30 Marks)**

Answer *ANY FIVE* questions　　　　　　　　　　　　　　　　　Marks

3. Recite the static and dynamic characteristics of a measurement system. (6)

4. Explain in detail about Ultrasonic type level indicators with neat sketch. (6)

5. Elaborate the working principle Air purge system type of level indicators with neat sketch. (6)

6. Compile about the selection of flow meters? (6)

7. Illustrate the construction and working operation of Mc Leod Gauge with a neat sketch? (6)

8. Explain the principle, construction and working operation of pyrometers with neat sketches? (6)

9. Write about the UV absorption Spectroscopy with a neat sketch? (6)

10. Discuss about the Flame photometry Emission Spectroscopy with a neat sketch? (6)

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