M.Sc.(Physics) Sem. 4

2 OCT 2020

Sub. Code. 4754

: નોંધ :

૧. દરેક પ્રશ્નનો [a] અથવા [a(i)] અને [a(ii)] જ લખવાના રહેશે.
૨. પ્રશ્ન : ૧[a] અથવા ૧[a(i)] અને ૧[a(ii)] તથા ૨[a] અથવા ૨[a(i)] અને ૨[a(ii)] ના 14 માર્કસ ના બદલે ૧૮ માર્કસ રહેશે.
૩. પ્રશ્ન : ૩[a] અથવા ૩[a(i)] અને ૩[a(ii)] તથા ૪[a] અથવા ૪[a(i)] અને ૪[a(ii)] ના 14 માર્કસ ના બદલે ૧૭ માર્કસ રહેશે.
૪. દરેક પ્રશ્નનો પ્રશ્ન નં ૧(b), પ્રશ્ન નં ૨(b), પ્રશ્ન નં ૩(b) તથા પ્રશ્ન નં ૪(b) (ટુંકા પ્રશ્નો) વિદ્યાર્થીએ લખવાના નથી.

Q.1 (A) (i) Which are the basic characteristics of measuring devices? Explain Hysteresis in detail. [07]

(ii) Explain variable capacitance transducer in detail. [07]

OR

(A) (i) Explain a generalized measurement system with block diagram. [14]

(B) Attempt any four: [4]

(i) Why simple closed-loop control systems are better than open-loop control systems?
(ii) What is the difference between a transducer and a sensor?
(iii) What are digital transducers?
(iv) Why calibration is required?
(v) Define zero drift?
(vi) What is span or range of an instrument?

Q.2 (A) (i) Which are the factors affecting strain measurements? Explain. [08]

(ii) What is temperature compensation? Explain temperature compensated gauges. [06]

OR

(A) (i) Explain the gauging techniques and other factors. Explain temperature effect in detail. [10]

(ii) Write applications of strain gauges. [4]

(B) Attempt any four: [4]

(i) What is temperature effect in gauging techniques?
(ii) Which are the factors affecting strain measurements?
(iii) Which are the types of electrical strain gauges?
(iv) What is strain?
(v) What is stress?
(vi) What is Gauge factor?

Q.3 (A) (i) Which are the basic types of elastic pressure-sensing elements used in electrical transducers? Explain Bellows in detail. [14]

OR

(A) (i) Explain "U-tube" manometer in detail. [7]

(ii) Describe metal diaphragms in the range of large deflections (Membranes). [7]

(B) Attempt any three: [3]

(i) What do you mean by absolute pressure?
(ii) What is the basic working principle of "U" tube manometer?
(iii) Where Bourdon tubes are used?
(iv) Write basic types of pressure transducers.
(v) What is the pressure measuring range of McLeod pressure gauge?

Q.4 (A) (i) Explain thermocouples in detail. [14]

OR

(A) (i) Explain thermistors in detail. [7]

(ii) Explain temperature measurement by radiation methods. [7]

(B) Attempt any three: [3]

(i) What is the application of Bi-metallic thermometer?

(ii) What is PTC and NTC?

(iii) What are the basic shapes of thermisters?

(iv) What is Seeback effect?

(v) What is Peltier effect?