Reg. No.:					

**Question Paper Code: 43603** 

## B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Instrumentation and Control Engineering

## 14UIC303-SENSORS AND TRANSDUCERS

(Common to Electronics and Instrumentation Engineering)

(Regulation 2014)

Duration: One hour Maximum: 30 Marks

PART A -  $(6 \times 1 = 6 \text{ Marks})$ 

## (Answer any six of the following questions)

(a) Active transducers	(b) Passive transducers
(c) Analog transducers	(d) Primary transducers

2. Two capacitances,  $C_1 = (150 \pm 2.4) \,\mu F$  and  $C_2 = (120 \pm 1.5) \,\mu F$ , are in parallel. What is the limiting error of the resultant capacitance C?

(a)  $0.9 \, \mu F$ 

(b)  $1.9 \,\mu F$ 

(c)  $3.9 \, \mu F$ 

(d)  $4.8 \, \mu F$ 

- 3. A strain gauge is a passive transducer and is employed for converting
  - (a) pressure into a change of resistance

1. Strain gauge, LVDT and thermocouple are examples of

- (b) force into a displacement
- (c) pressure into displacement
- (d) mechanical displacement into a change of resistance
- 4. The desirable static characteristic of a measuring system are
  - (a) Accuracy and reproducibility
- (b) Accuracy, sensitivity and reproducibility

(c) Drift and dead zone

(d) Static error

5.	Material used for the te	emperature range of	operation (160-40	0)°C				
	(a) platinum	(b) copper	(c) tungster	n (d)nickel				
6.	Capacitive transducers	are normally emplo	yed for	measurements				
	(a) Static	(b) Dynamic	(c) Transient	(d) Both static and dynamic				
7.	Quartz and Rochelle s  (a) Natural group	alt belongs to	of piezo-electric materials  (b) Synthetic group					
	(c) Natural or Synt	hetic group	(d) Fiber group					
8.	Fiber optic sensor can	be used to sense						
	(a) Displacement	(b) Power	(c) Current	(d) Resistance				
9.	Which sensor is used for	or the detection of o	bjects in a moving	conveyor?				
	(a) vibration	(b) velocity	(c) piezoresistiv	ve (d) proximity				
10.	Humidity sensor emplo	oyed for determination	on of					
	(a) Relative Humio (c) Temperature	lity	(b) Bourdon tul (d) Nuclear rad					
		PART – B (3	x 8= 24 Marks)					
	(A	nswer any three of	the following que	estions)				
11.	Discuss in detail t explain how to min	• •	of errors occurring	in measuring instruments an (8				
12.	State in detail, various types of static characteristics of transducers with example. (8)							
13.	•	With the basic principle of operation, derive the necessary conditions for loading effect of potentiometer under loading. (8						
14.	•	tric effect. Explain	•	ectric crystal is used for the (8)				
15.	With neat sketch	•	ons, illustrate th	e constructional details an (8)				