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 **Reg. No. :**

**Question Paper Code: 52119**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2017

Second Semester

Biomedical Engineering

15UBM209 - SENSORS AND MEASUREMENT TECHNIQUES

 (Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. The following is not a static performance parameter to be looked into before selecting a parameter

(a) Range (b) Deflection (c) Stability (d) Error

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(a) Range (b) Deflection (c) Stability (d) Error

3. Pressure transducer for measuring blood pressure is

 (a) Strain gauge transducer only (b) Strain gauge or capacitive transducer

 (c) Resistive transducer (d) Fiber optic transducer

4. It is required to measure temperature in the range of 1300-1520°C. The most suitable thermocouple is

 (a) Chromel Constantan (b) Iron Constantan

 (c) Chromel Aluminum (d) Platinum - Rhodium

5. \_\_\_\_\_\_\_\_ fiber is used inter ferometric instruments.

(a) mono mode (b) multimode (c) birefringent (d) coated

6. Which of the following effects is used in measurement of magnetic flux.

(a) Hall effect (b) See back effect (c) Piezoelectric effect (d) Piezoresisitive effect

7. In phase response of a recorder noise level \_\_\_\_\_\_\_ with the bandwidth of the system.

 (a) Increases (b) Decreases (c) Reaches unity (d) Reaches Infinity

8. The device that plots the response of a physical parameter with respect to other parameter.

 (a) X-Y recorder (b) Graphical recorder (c) Strip chart recorder (d) Magnetic tape recorder

9. Anderson bridge unknown inductance is measured in terms of

 (a) Known inductance and resistance (b) Known capacitance and resistance

(c) Known inductance (d) Known capacitance

10. Kelvin's double bridge is used to measure low resista123456

nces because

 (a) it has high sensitivity (b) there is no thermoelectric emf

(c) resistance variation due to temperature (d) effect of contact and lead resistances is eliminated

PART - B (5 x 2 = 10 Marks)

11. Classify the Standards.

12. Brief the principle of capacitive transducer.

13. What is fiber optic transducer?

14. Outline the principle of sampling oscilloscope.

15. Name the sources of errors in AC bridge measurements.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain in detail about static characteristics. (16)

Or

 (b) (i) Classify standards and give example for each level of standard. (8)

 (ii) Discuss the dynamic characteristics of measuring system and identify its significance in measurement system. (8)

17. (a) Describe in detail about strain gauge with neat diagram and also derive poison’s ratio. (16)

Or

(b) Describe the construction and working of LVDT for pressure measurement with the aids of a diagram. (16)

18. (a) Explain in detail about Piezoelectric transducer with neat diagram. (16)

Or

 (b) (i) Describe the principle of operation of Hall Effect transducers. (8)

 (ii) Explain the working of a fiber–optic displacement transducer. Draw its input– output characteristics. (8)

19. (a) Draw the block diagram of X-Y recorder and explain each part. (16)

Or

 (b) (i) Illustrate the functioning of digital storage oscilloscope. (8)

 (ii) Explain the working of magnetic tape recorder with its merits and demerits. (8)

20. (a) (i) Sketch the Schering bridge and derive its balance condition. (8)

 (ii) Prove that the output voltage of wheat stone bridge is zero under balanced condition. (8)

Or

 (b) With the help of circuit draw the following bridge and derive the balanced equation

 (i) Schering bridge (8)

 (ii) Maxwell bridge (8)

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