

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIFTH SEMESTER B.TECH DEGREE EXAMINATION, DECEMBER 2018**

**Course Code: AE303**

**Course Name: ELECTRICAL MEASUREMENTS AND MEASURING INSTRUMENTS**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any two full questions, each carries 15 marks.*

- |   |   | Marks |
|---|---|-------|
| 1 | a) Differentiate between absolute and relative errors.  | (4)   |
|   | b) Calculate the maximum percentage errors in the sum and differences of two voltage measurements when $V_1=100V+1\%$ & $V_2= 80V+5\%$  | (6)   |
|   | c) Distinguish between range and span of measuring instruments.   | (5)   |
| 2 | a) An $820\Omega$ resistance with an accuracy of $\pm 10\%$ carries a current of 10mA. The current was measured by an analog ammeter on a 25mA range with an accuracy of $\pm 2\%$ of full scale. Calculate the power dissipated in the resistor, and determine the accuracy of the result. | (8)   |
|   | b) Explain shaded pole and two pole methods of induction.   | (7)   |
| 3 | Derive expressions for deflection torques for repulsion and attraction type moving iron instruments with their basic working principles.  | (15)  |

**PART B**

*Answer any two full questions, each carries 15 marks.*

- |   |   |      |
|---|---|------|
| 4 | Explain measurement of medium resistances using Wheatstone bridge method and Carey Foster bridge method.          | (15) |
| 5 | Describe Maxwell's Inductance bridge and Maxwell Inductance Capacitance bridge with its basic working principles. | (15) |
| 6 | a) Demonstrate the working of Kelvin Double Bridge.   | (7)  |
|   | b) How is capacitance measured using Schering Bridge?   | (8)  |

**PART C**

*Answer any two full questions, each carries 20 marks.*

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|---|--|------|
| 7 | a) What are the features of LCDs? Mention its advantages over LED.   | (10) |
|   | b) Describe the working of a strip chart recorder.   | (10) |
| 8 | a) With block diagram elaborate the working of a spectrum analyser.  | (10) |
|   | b) What resolution, total frequency display and dynamic range would be available from an input signal that was sampled for 4s at a sampling rate of 20kHz using a 10 bit conversion? | (5)  |
|   | c) What is meant by driving torque and braking torque in an energy meter?  | (5)  |
| 9 | a) Explain the functions of X-Y recorder and explain its working.  | (10) |
|   | b) Explain the working of a digital spectrum analyser using block diagram.   | (10) |

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