Subject Code: KIC501

PAPER ID-410834

Roll No: | | | | | | | | | | | | | |

B. TECH.
(SEM V) THEORY EXAMINATION 2021-22
INSTRUMENTATION & MEASURMENT

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

a. What is meant by resolution of any instrument?

b. Give the difference between gross and relative errors.

c. The measured value of resistance is 9.25ohm, where as its value is 9.22 ohm. Determine absolute error of measurement.

d. Mention the advantages of digital voltmeters over analog voltmeters.

e. Define importance of Kelvin double bridge over Wheatstone bridge.

f. Define high voltage probe?

g. What is the function of Vertical deflection plate and horizontal deflection plate in CRO?

h. Why ordinary Voltmeter cannot be used in electronic circuit?

i. Define term Transducer.

j. What are the difference between CRO and DSO.

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30

a. Explain the principle of PMMC instrument? How controlling torque provided in PMMC instrument?

b. Discuss the working of an op-amp based full wave rectifier voltmeter.

c. Find out the expression of unknown resistance and inductance by Maxwell bridge.

d. Describe construction and working of Digital storage oscilloscope (DSO) with its application. Why it is widely preferred over CRO?

e. Explain the principle and working of LVDT. Draw the combination of Burdon tube with LVDT.

SECTION C

3. Attempt any *one* part of the following: 10 x 1 =10

a. The coil dimensions on a galvanometer are $l=d=$ 1.5cm, and the air gap flux density is 150mT.The light-beam pointer is 1.5 m, and the control spring constant is 4×10^{-6} Nm/rad. Calculate the number of coil turns to give a current sensitivity of 100mm/μA when the on-scale deflection is 300mm.

b. Explain construction of series ohmmeter and their application.

4. Attempt any *one* part of the following: 10 x 1 =10

a. Explain the working of source follower electronic voltmeter? Describe how the range of this voltmeter can be extended?

b. Explain principle and working of a ramp type DVM.

5. Attempt any *one* part of the following: 10 x 1 =10

a. Draw and explain working of wheat stone bridge?

b. Explain how unknown capacitor can be measured by Schering bridge?

6. Attempt any *one* part of the following: 10 x 1 =10

a. Draw and explain the block diagram of digital frequency meter? Explain in detail.

b. What is the difference between spectrum analyzer and wave analyzer? Explain the working of spectrum analyzer with block diagram.

7. Attempt any *one* part of the following: 10 x 1 =10

a. What is Seeback effect? Draw and explain the working of thermocouple.

b. What is inverse transducer? Explain the working of piezoelectric transducer.