HCM-003-027702 Seat No. _____

M. Sc. (ECI) (Sem. VII) (CBCS) Examination

October – 2017

Advance Instrumentation : Paper - 26

(New Course)

Faculty Code : 003

Subject Code : 027702

Time : Hours] [Total Marks : **70**

Instructions : (1) All questions carry equal marks.

(2) Figures on right hand side indicate marks.

1 (A) State whether the following statements are true or false. **14**

(1) Wave analyzers are also referred to as frequency selective voltmeters.

(2) The output power Wattmeter is designed to indirectly measure the output power in an arbitrary load.

(3) The overall efficiency of coils and capacitors intended for RF applications is best evaluated using the Q value.

(4) Magger is used to measure very low resistance.

(5) A Wheatstone bridge may be used to measure the dc resistance of various types of wire.

(6) Basic LCR bridge also known as Skeleton type.

(7) Impedances at AF and RF are commonly determined by means of a dc Wheatstone bridge.

(8) The strain gauge is an example of an active transducer.

(B) Answer the following : (any **three**)

(1) Define the term recorder.

(2) What do you mean by electrical transducer ?

(3) List five physical quantities that transducer measures.

(4) What is the difference between an indicator and recorder ?

2 Answer the following : (any **two**)

(1) What is difference between a wave analyzer and a harmonic distortion analyzer ? Draw the circuit diagram and explain the working of a heterodyne type wave analyzer. **7**

(2) Draw and discuss the basic wave analyzer. **7**

(3) Explain the working principle of an output power meter. **7**

3 Answer the following :

(1) What is LCR bridge ? How can L, C and R be measured using a skeleton LCR bridge ? **5**

(2) Discuss the principle applications of Kelvin's bridge. Also describe the operation of a Kelvin's bridge. **5**

(3) Discuss about Wheatstone's bridge. **4**

OR

3 Answer the following :

(1) Gives the types of recorders in detail. **5**

(2) Explain basic strip chart recorder. **5**

(3) Give the advantages and disadvantages of Digital data recording. **4**

4 Answer the following :

(1) List the different types of transducers. Explain the working principle of thermistor. **5**

(2) What is a signal conditioner ? What are the basic elements of a single conditioner. **5**

(3) How can measurements at microwave frequencies be done ? Draw and discuss the cavity wave meter. **4**

5 Answer the following : (any **two**)

(1) Give the classification of electronic recording instruments. What are the basic components of a magnetic recorder ? Explain its operation. **7**

(2) Explain the principle of operation of a stroboscope. Also explain how the speed of a motor can be measured using a stroboscope. **7**

(3) What do you mean by sensitivity and selectivity of a radio receiver ? How can be measured ? **7**

(4) What is an op.amp? Give the electrical characteristics of an ideal op.amp. Also discuss the integrator circuit using operational amplifier with diagram. **7**
