E 3758

Reg. No...............................

Name....................................

B.Sc. DEGREE (C.B.C.S.S.) EXAMINATION, NOVEMBER 2022

Fourth Semester

Core Course—INSTRUMENTATION ELECTRONICS

(Common for B.Sc. Electronics and B.Sc. Computer Maintenance and Electronics)

(2013—2016 Admissions)

Time : Three Hours   Maximum Marks : 80

Part A

*Answer **all** questions.*
Each question carries 1 mark.

1. ————————— transducers are those in which the resistance changes due to a change in some physical phenomenon.

2. The closeness with which an instrument reading approaches the trace value of the quantity being measures is called —————————.

3. ————————— are non-metallic resistors made by sintering mixtures of metallic oxides such as manganese, nickel, cobalt, cropper and uranium.

4. The differential transformer is a passive inductive transformer and is also known as as —————————.

5. A ————————— is a measuring instrument that displays a time-varying signal in a form easy to examine, even after the original signal has ceased to exist.

6. Wave analyzers are used in the frequency range of —————————.

7. A ————————— analyzer provides a calibrated graphical display on its CRT, with frequency on the horizontal axis and amplitude on the vertical axis.

8. Storage oscilloscopes operates on the principle of —————————.

9. The ————————— in CRO is the heart of its display mechanism.

10. ————————— time is the time required for the pulse to increase from 10% to 90% of its normal amplitude.

$(10 \times 1 = 10)$

Turn over

Part B

Answer any **eight** *questions.*
Each question carries 2 *marks.*

11. State working principle of resistive transducer.

12. What is LVDT ? Where is it used ?

13. What is the condition to get maximum sensitivity in a Wheatstone bridge ?

14. State the advantages of counter type ADC.

15. Draw the diagram of successive approximation ADC.

16. Explain the principle of single slope integration.

17. State any two advantages of digital multimeter over analog multimeter.

18. Explain the speciality of storage oscilloscope.

19. Name the major components of fundamental suppression harmonic distortion analyser.

20. What is frequency counter ?

21. What are the requirements of signal generator ?

22. What are the requirements of pulse generator?

$(8 \times 2 = 16)$

Part C

Answer any **six** *questions.*
Each question carries 4 *marks.*

23. Write a note on static characteristics of instruments.

24. Explain active and passive transducer in detail.

25. How do you measure the unknown inductance using Hay's Bridge ? Explain.

26. Explain the operation of R-2R DAC.

27. Explain Maxwell Bridge.

28. Draw the block diagram of Digital spectrum analyzer and explain.

29. Explain piezoelectric transducer.

30. Explain the principle of operation of distortion analyzer.

31. Explain the working principle of thermistor.

(6 × 4 = 24)

Part D

Answer any **two** *questions.*
Each question carries 15 *marks.*

32. Explain in detail the different types of temperature transducers.

33. Sketch the block diagram of a CRO. Explain the functions of each part in detail.

34. What is Q meter ? Explain about its applications and discuss in detail about any one method of measurement using a Q meter.

35. Explain how Wien Bridge is used to measure 'frequency'. Derive expression for frequency.

(2 × 15 = 30)