FOURTH SEMESTER (CBCSS—UG) DEGREE EXAMINATION
APRIL 2021

Instrumentation

INS 4B 06—ELECTRIC CIRCUITS AND MEASURING INSTRUMENTS

Time : Two Hours   Maximum : 60 Marks

Section A (Short Answer Type Questions)

Answer at least **eight** *questions.*
Each question carries 3 marks.
All questions can be attended.
Overall Ceiling 24.

1. Slate maximum power transfer theorem.

2. List any *two* advantages of Kirchhoffs laws.

3. Explain the steps involved in reciprocity theorem.

4. List any *four* advantages of PMMC instruments.

5. Distinguish deflecting and controlling torque.

6. List different types of damping.

7. List advantages of electronic type Megger.

8. What is the working principle of energy meter ?

9. Write expression for inductance using Maxwells inductance bridge ?

10. What is the use of flux meter ?

11. List any two applications of Q meter ?

12. What is CRO and its uses ?

(8 × 3 = 24 marks)

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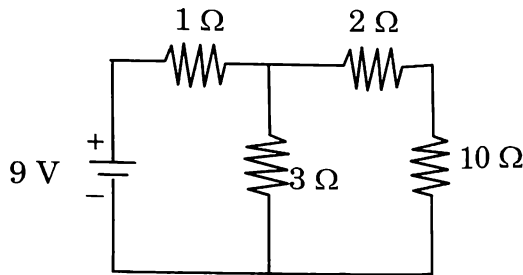
Section B (Paragraph Type Questions)

Answer at least **five** *questions.*
Each question carries 5 marks.
All questions can be attended.
Overall Ceiling 25.

13. State and prove Kirchoffs voltage law.

14. Find Thevenin voltage across 10 Ω using Thevenin's Theorem.

15. Explain two methods to produce controlling torque.

16. List advantages and disadvantages of gravity control.

17. Derive balance condition for Kelvin double bridge.

18. How inductance is measured by Maxwell's inductance bridge ?

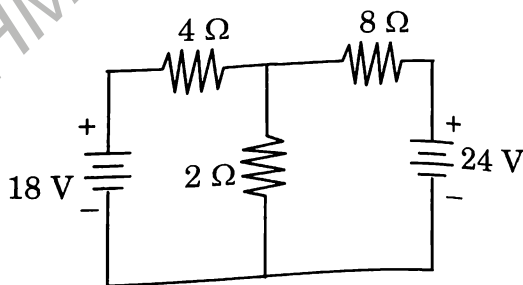19. Draw the block diagram of Digital Storage Oscilloscope ?

(5 × 5 = 25 marks)
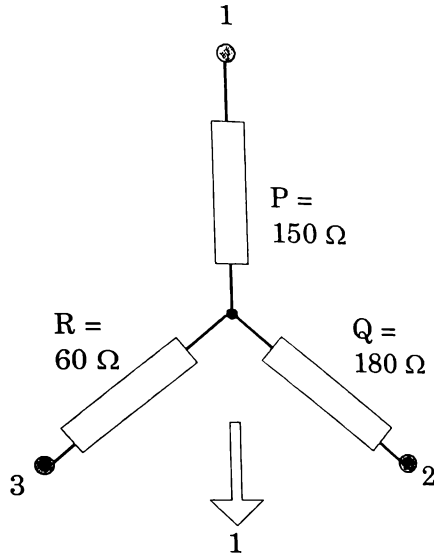
Section C (Essay Type Questions)

Answer any **one** *question.*
The question carries 11 marks.

20. Consider the given circuit and find the current through 2Ω resistor using superposition theorem.

21. Convert the following Star Resistive Network into an equivalent Delta Network.

(1 × 11 = 11 marks)

FOURTH SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2021

Instrumentation

ITN 4B 06—ELECTRICAL AND ELECTRONIC INSTRUMENTATION

(2018 Admissions)

Time : Three Hours

Maximum : 80 Marks

Section A (Objective Type Questions)

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

1. Which of the following is nonlinear circuit parameter :

    (a) Inductance.

    (b) Condenser.

    (c) Wire wound resistor.

    (d) Transistor.

2. The superposition theorem is essentially based on the concept of :

    (a) Duality.

    (b) Linearity.

    (c) Reciprocity.

    (d) Nonlinearity.

3. An ideal ammeter functions as ———— circuit.

    (a) Short circuit.

    (b) Open circuit.

    (c) An infinite circuit.

    (d) None of the above.

4. A voltmeter should have ———— resistance.

    (a) Zero.

    (b) Very high.

    (c) Very low.

    (d) None of the above.

5. A ohm meter is basically :

    (a) A ammeter.

    (b) A voltmeter.

    (c) A multimeter.

    (d) None of the above.

6. Which of the following bridge is frequency sensitive ?

    (a) Wheatstone bridge.

    (b) Maxwell bridge.

    (c) Anderson's bridge.

    (d) Wein bridge.

Turn over

7. The current sensitivity of a meter is expressed in :

   (a) Ohm/ampere.

   (b) Ohm/volt.

   (c) Ampere /division.

   (d) Ampere.

8. Loading effect is principally caused by ———— instruments.

   (a) High resistance.

   (b) Low-sensitivity.

   (c) High-sensitivity.

   (d) High-range.

9. The input impedance of CRO is :

   (a) Zero.

   (b) Around 100ohms.

   (c) Around 1000ohms.

   (d) Around one mega ohms.

10. In a digital storage oscilloscope the wave form is stored in ————.

    (a) Compressed form.

    (b) Analog form.

    (c) Mixed form

    (d) Digital form.

(10 × 1 = 10 marks)

Section B (Short Answers Type Questions)

One **or** *two sentences each.*
Answer any **ten** *questions.*
Each question carries 2 marks.

11. What is meant by ideal constant voltage source ?

12. State Kirchhoff s voltage law.

13. What is reciprocity theorem ?

14. A 1mA meter movement with an internal resistance of $100\,\Omega$ is to be converted-into a 0-100 mA. Calculate the value of shunt resistance required.

15. Draw the circuit diagram of a shunt type ohmmeter.

16. Briefly explain thermal type watt meter.

17. Explain about Analog Frequency Meter.

18. Draw the block diagram of dual trace oscilloscope.

19. What is a digital voltmeter ?

20. Sketch the block diagram of a digital multimeter.

21. Explain about the digital frequency meter

22. What is a Q-meter ?

(10 × 2 = 20 marks)

Section C (Paragraph Type Questions)

Answer any six questions.
Each question carries 5 marks.

23. Explain Star/Delta transformation.

24. State and explain Thevenin's theorem.

25. With a diagram explain basic electrodynamometer as an ammeter.

26. Explain the principle and working of a AC voltmeter using rectifiers.

27. With the help of a diagram explain the working of a Dual beam CRO.

28. Briefly explain principle and working of a transistor voltmeter.

29. Draw and explain working of a digital phase meter.

30. With a suitable diagram explain the principle of a square wave generator.

31. Write the principle and operation of Hall effect.

(6 × 5 = 30 marks)

Section D (Essay Type Questions)

Answer any two questions.
Each question carries 10 marks.

32. State and prove Norton's theorem.

33. Explain : (a) Digital Storage Oscilloscope ; (b) Nano-ammeter.

34. Give an account of : (a) Moving coil galvanometer ; (b) Hay's bridge.

35. With a relevant diagram explain the principle and working of a function generator.

(2 × 10 = 20 marks)