

19. (a) Discuss the challenge's in security issues.

Or

- (b) What is Modbus? How does it work?
20. (a) How do you classify the areas into zones based on safety?

Or

- (b) State the difference between earthing, grounding and bonding.

PART C — ($3 \times 10 = 30$)

Answer any THREE questions.

21. Draw a circuit of multimeter and explain it.
22. Show how a Maxwell's bridge can be used to measure inductance.
23. Explain the working of a harmonic distortion analyzer with neat block diagram.
24. Discuss the OSI model with neat block diagram.
25. Explain about machinery safety standards.

S.No. 2810

P 22 ELCC 1 A

(For candidates admitted from 2022–2023 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2022.

Electronics — Core Choice Course

ADVANCED ELECTRONIC INSTRUMENTATION

Time : Three hours

Maximum : 75 marks

PART A — (20 marks)

Answer ALL questions.

- I. Choose the correct answer. ($5 \times 1 = 5$)
1. The sensitivity of a moving coil galvanometer can be increased by decreasing
- (a) The number of turns in the coil
 - (b) The area of the coil
 - (c) The magnetic field
 - (d) The couple per unit twist of the suspension
2. The range of resistance measured in a Kelvin bridge is
- (a) 10Ω to $10 \text{ m}\Omega$
 - (b) 1Ω to $10 \mu\Omega$
 - (c) 0.01Ω to $10 \text{ M}\Omega$
 - (d) 0.1Ω to $10 \text{ n}\Omega$

3. The condition for oscillation is _____
- (a) A phase shift around the feedback loop of 180°
 - (b) A gain around the feedback loop of one-third
 - (c) A phase shift around the feedback loop of 0°
 - (d) A gain around the feedback loop of less than 1

4. The number of layers in ISO OSI reference model is.

- (a) 4 (b) 5
- (c) 6 (d) 7

5. Solid grounding is adopted for voltages below

- (a) 100 V (b) 200 V
- (c) 400 V (d) 660 V

- II. Fill in the blanks : (5 × 1 = 5)

6. The internal resistance of an ideal voltmeter should be _____
7. The wheat stone bridge is used to measure unknown _____
8. The total gain in a _____ circuit should be one or greater than one.
9. DHCP stands for _____
10. _____ Safety is a low-energy signaling technique that prevents explosions.

- III. Answer the following : (5 × 2 = 10)

- 11. What is Q-factor of the coil?
- 12. Which bridge is used to measure Inductance with a high Q-factor?
- 13. What is Harmonic?
- 14. Expand HART.
- 15. Why is a safety life-cycle needed?

PART B — (5 × 5 = 25)

Answer ALL questions, choosing either (a) or (b)

16. (a) Explain the operation of PMMC meter.

Or

- (b) A 1 mA meter movement with an internal resistance of 100 ohms is to be converted in to a 0 - 100 mA ammeter. Calculate the value of shunt resistance required.

17. (a) Describe the operation of wheat stone bridge.

Or

- (b) What two conditions must be satisfied to make an AC bridge balance?

18. (a) Draw the block diagram of a pulse generator circuit and explain it.

Or

- (b) What is the difference between a wave analyzer and a harmonic distortion analyzer?