19. (a) Explain the concept of Modbus.

Or

(b) Write short on the security plan in data communication.

20. (a) Discuss the role of Sensors in safety instruments.

Or

(b) Write the importance of machinery safety.

SECTION C — (3 × 10 = 30)

Answer any THREE out of Five questions.

21. Explain the working of Ammeter shunts and multirange Ammeters.

22. Explain the wien bridge operation with neat diagram.

23. Discuss the pulse and square wave generators with diagram.

24. Explain the industrial network security and network challenges.

25. Describe the concept of regulations and standards for safety instrumentation.

———————

S.No. 6403 **P22 ELCC 1 A**

(For candidates admitted from 2022–2023 onwards)

M.Sc. DEGREE EXAMINATION, NOVEMBER 2023.

Electronics — Core Choice Course

ADVANCED ELECTRONIC INSTRUMENTATION

Time : Three hours Maximum : 75 marks

SECTION A — (20 marks)

Answer ALL questions.

I. (A) Choose the correct answer. (5 × 1 = 5)

1. An ideal voltmeter has ————————

(a) zero resistance (b) low resistance

(c) infinite resistance (d) moderate resistance

2. AC bridges are used for the measurement of ————————

(a) Resistances

(b) Resistances and Inductances

(c) Inductances and capacitances

(d) Resistances, inductances and capacitances

3. ———— provides different types of waveforms such as sine, triangular, square etc.
   (a) Oscillator
   (b) Signal generator
   (c) DC Tachometer generator
   (d) None of the above

4. What is the most common physical layer used for Modbus communication?
   (a) RS-232 (b) RS-485
   (c) Ethernet (d) USB

5. IEC Standards used for Safety Instrumented Systems are
   (a) 61508 & 61511 (b) 61805 & 61511
   (c) 61805 & 61501 (d) 61508 & 61151

(B) Fill in the blanks. (5 ×1 = 5)

6. A moving coil galvanometer can be converted into an ammeter by connecting galvanometer to a low resistance in ————.

7. The AC Bridge used for the measurement of inductance is ————

8. ———— provides only sinusoidal signal at the output.

9. ———— is the maximum number of devices that can be connected to a single Modbus network.

10. Electrical ———— is the connection of two or more metal parts to establish electrical continuity and conductivity.

II. Answer ALL questions. (5 × 2 = 10)

11. What will happen if an ammeter is connected in parallel with a circuit?

12. Mention the application of Wien bridge.

13. What is an oscillator?

14. What is HART protocol?

15. What is the use of Earthing?

SECTION B — (5 × 5 = 25)

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

16. (a) Explain the voltmeter sensitivity and loading effect.

Or

(b) Explain the working of series type Ohmmeter.

17. (a) Explain about working of Kelvin bridge with diagram.

Or

(b) Write a note on the measurement of inductance using Maxwell bridge.

18. (a) Explain the functions of wave analyzers.

Or

(b) Discuss about signal generators in wave generation.