



B.E/B.TECH DEGREE EXAMINATIONS: APRIL / MAY 2023

(Regulation 2018)

Fourth Semester

ELECTRONICS AND INSTRUMENTATION ENGINEERING

U18EIT4005: Ancillary Support Systems

COURSE OUTCOMES

- CO1:** CO1: Evaluate the basic principles of EMI/EMC problem identification, design, and prevention, earthing and shielding principles, procedures and practices.
- CO2:** CO2: Evaluate the principles of power distribution systems and system components.
- CO3:** CO3: Develop a wiring diagram for a control panel.
- CO4:** CO4: Evaluate the concepts of motor protection and control.
- CO5:** CO5: Illustrate the operation of hydraulic and pneumatic systems.

Time: Three Hours

Maximum Marks: 100

**Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)**

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|---------------------------------------------------------------------------------------|-----|------|
| 1. List the various types of EMI that can be caused and its protection techniques. | CO1 | [K1] |
| 2. Differentiate safety and signal grounds. | CO1 | [K2] |
| 3. Compare line to line fault and line to ground fault. | CO2 | [K2] |
| 4. Give the need for switchgears in electrical power systems. | CO2 | [K2] |
| 5. Mention the professional skills required for control panel wiring. | CO3 | [K1] |
| 6. Outline the electrical safety precautions to be followed for control panel wiring. | CO3 | [K3] |
| 7. Starters are necessary for starting three phase induction motors. Give reasons. | CO4 | [K3] |
| 8. Sketch the bipolar drive for stepper motor. | CO4 | [K1] |
| 9. State the function of an actuator in a hydraulic system. | CO5 | [K2] |
| 10. Mention the function of the actuator in pneumatic systems. | CO5 | [K1] |

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

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| 11. | a) | Estimate how to identify, design correctly and fix EMC/EMI problems. | 8 | CO1 | [K2] |
| | b) | Illustrate earthing and shielding principles and practices. | 8 | CO1 | [K2] |
| 12. | a) | With a neat diagram interpret the construction and working principle of any one type of circuit breaker. | 8 | CO2 | [K2] |
| | b) | Demonstrate the types of power cables, the installation procedure and the probable faults. | 8 | CO2 | [K2] |
| 13. | a) | Draw and explain the electrical panel wiring diagram for motor starter circuit. | 8 | CO3 | [K2] |
| | b) | Elaborate the electrical safety precautions to be taken care of while handling fault conditions. | 8 | CO3 | [K3] |
| 14. | a) | Describe with construction diagrams the working of a star delta starter. | 8 | CO4 | [K2] |
| | b) | With basic equations of DC motor explain the armature voltage method of speed control of DC motor. | 8 | CO4 | [K1] |
| 15. | a) | Categorize the electrical elements present in a hydraulic system. | 8 | CO5 | [K3] |
| | b) | Illustrate how power transition takes place in a pneumatic system. | 8 | CO5 | [K3] |
| 16. | a) | Demonstrate the V/f method of speed control of induction motor using a VFD. | 8 | CO4 | [K2] |
| | b) | Develop a fluid power system with a block diagram. Also indicate the types of fluids used and its properties. | 8 | CO5 | [K3] |
