

S. B. Roll. No.....

**ELECTRICAL MEASUREMENT AND INSTRUMENTATION**  
**4<sup>th</sup> Exam/Elect/5808/May'25**  
**(For 2023 Batch Onwards)**

**Duration: 3Hrs.**

**M.Marks:50**

**SECTION-A**

**Q1. Do as directed any nine of the following.**

**9x1=9**

- a. Ammeter measures the amount of \_\_\_\_\_ flowing through a circuit.
- b. Shunts are used for increasing the range of an \_\_\_\_\_.
- c. A PMMC instrument can be used for d.c only (T/F).
- d. The meter used for measuring electrical energy is called wattmeter.(T/F)
- e. In dynamometer type wattmeter \_\_\_\_\_ coil is split up into two equal portions.
- f. A \_\_\_\_\_ transformer is an instrument transformer which is used to measure alternating current of large magnitude by stepping down by transformer action.
- g. The instrument used for measurement of power factor is known as \_\_\_\_\_.
- h. Passive transducers are those that take the power for transduction from an \_\_\_\_\_ power source.
- i. Current represents the \_\_\_\_\_ at which charge is flowing.
- j. LVDT stands for \_\_\_\_\_
- k. Thermistor is a contraction of a term thermal resistors. (T/F)
- l. Define the term transducer.

**SECTION-B**

**Q2. Attempt any five questions.**

**5x4=20**

- i. State and explain the different types of electrical measuring instruments.
- ii. Explain how the range of an ammeter can be extended?
- iii. Explain the remedies of different errors in induction type energy meters.
- iv. Explain the working of vibrating reed type frequency meter.
- v. Write a short note on displacement transducer.
- vi. Explain the construction and working of moving coil instruments.
- vii. Differentiate between an ammeter and a voltmeter.

**SECTION-C**

**Q3. Attempt any three questions.**

**3x7=21**

- a. Explain the essentials of indicating instruments.
- b. Explain the principle, construction and working of moving iron instruments.
- c. Explain the principle, construction and working of dynamometer type wattmeter.
- d. Explain the principle, construction, working, advantages and disadvantages of thermocouple.
- e. Explain the construction and working of induction type single phase energy meter.

S. B. Roll. No. 23155207013

**INDUSTRIAL ELECTRONICS AND CONTROL OF DRIVES**  
**4<sup>th</sup> Exam/Elect./5809/May'25**  
**(For 2023 Batch Onwards)**

Duration: 3Hrs.

M.Marks:50

**SECTION-A**

**Q1. Do as directed any nine of the following.**

**9x1=9**

- During forward \_\_\_\_\_ state, a thyristor is associated with low current and large voltage.
- The process of turning off a thyristor is called \_\_\_\_\_.
- In SCR circuits, the snubber circuit is used for \_\_\_\_\_.
- SCRs are connected in parallel to enhance \_\_\_\_\_.
- An UJT shows \_\_\_\_\_ resistance region between peak and valley points.
- A Triac behaves like two anti-parallel connected \_\_\_\_\_.
- In a chopper the load voltage can be controlled by controlling \_\_\_\_\_ cycle.
- \_\_\_\_\_ is a frequency changer circuit.
- For wide range of speed control \_\_\_\_\_ drives are preferred.
- UPS stands for \_\_\_\_\_.
- The value of holding current of an SCR is slightly lesser than the value of its \_\_\_\_\_.
- A circuit that converts dc power into ac power at desired voltage and frequency is called \_\_\_\_\_.

**SECTION-B**

**Q2. Attempt any five questions.**

**5x4=20**

- What are the different methods of triggering SCR?
- What is heat sink and why is it necessary?
- Write a short note on Series and Parallel connections of thyristors.
- Discuss dv/dt and di/dt protection of SCR.
- What is the difference between controlled and uncontrolled rectifiers?
- Explain the working of single-phase dual converter.
- How the speed reversal of a dc motor is achieved using dual converter?

**SECTION-C**

**Q3. Attempt any three questions.**

**3x7=21**

- Write a note on UJT and its working as relaxation oscillator.
- Explain the working of a single-phase fully controlled bridge rectifier with resistive and inductive load.
- What is Chopper? Explain its working, different types, and applications.
- Discuss the working, applications, and limitations of series inverter.
  - Explain the scheme for the speed control of a universal motor.
  - Compare ON-line, OFF-line and Line-interaction UPS.

S. B. Roll. No.....

**BASICS OF DIGITAL ELECTRONICS**  
**4<sup>th</sup> Exam/Elect/5806/May'25**  
**(For 2023 Batch Onwards)**

**Duration: 3Hrs.**

**M.Marks:50**

**SECTION-A**

**Q1. Do as directed any nine of the following.**

**9x1=9**

- Analog signals are \_\_\_\_\_ signals.
- LED stands for \_\_\_\_\_.
- The base of octal number is \_\_\_\_\_.
- A digital circuit processes \_\_\_\_\_ signals.
- SISO stands for \_\_\_\_\_.
- Write the names of universal gates.
- A multiplexer changes \_\_\_\_\_ data into \_\_\_\_\_ data.
- Flip- flops are also known as \_\_\_\_\_.
- BCD stands for \_\_\_\_\_.
- Write the names of any two types of A/D Converters.
- Convert  $(10101010001)_2$  to Octal number.
- What is the full form of T Flip-flop?

**SECTION-B**

**Q2. Attempt any five questions.**

**5x4=20**

- Differentiate between combinational and sequential circuit.
- What do you mean by multiplexer? Design 1:8 Multiplexer.
- Explain the universal property of NOR gate.
- State and prove De-Morgan theorem with the help of truth table.
- Write a note on shift register.
- Draw a logic symbol of D- Flip-flop and its truth table. Give applications of flip flops.
- Draw and explain the logic diagram of Half Adder with truth table.

**SECTION-C**

**Attempt any three questions.**

**3x7=21**

**Q3. a) Using K-Map simplify the following.**

**5**

$$F_1 = \sum_m (0,4,12,8,9,13,7,15)$$

b) Explain Gray code with suitable example.

**2**

**Q4. a) Differentiate between analog and digital signals.**

**3**

b) Draw and explain different types of basic gate with truth tables.

**4**

**Q5. Draw and explain the working of 2-bit UP Counter with suitable diagram?**

**Q6. Explain the working principle of J-K Flip Flop and draw its truth table.**

**Q7. What do you mean by A/D converter? Explain any one type of A/D converter in detail.**

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S. B. Roll. No.....

**ELECTRICAL MACHINES-II**  
**4<sup>th</sup> Exam/Elect/5807/May'25**  
**(For 2023 Batch Onwards).**

**Duration: 3Hrs.**

**M.Marks:50**

**SECTION-A**

**9x1=9**

**Q1. Do as directed any nine of the following.**

- a. Yoke of Induction motor is made of \_\_\_\_\_
- b. Skewing of rotor slots \_\_\_\_\_ rotor resistance.
- c. For record Players a \_\_\_\_\_ motor is suitable.
- d. Hydro generators are usually of \_\_\_\_\_ type.
- e. A universal motor has \_\_\_\_\_ starting torque.
- f. The reactance of the rotor is proportional to the \_\_\_\_\_
- g. Slip rings in a synchronous motor carry \_\_\_\_\_
- h. A.C Series motor of a large size are used in \_\_\_\_\_
- i. Stator stampings are made of \_\_\_\_\_
- j. Rating of alternator is given in \_\_\_\_\_
- k. Ceiling fans use \_\_\_\_\_ motors.
- l. Salient pole synchronous generator has \_\_\_\_\_ speed.

**SECTION-B**

**5x4=20**

**Q2. Attempt any five questions.**

- i. Write a short note on stepper motor.
- ii. Explain the phenomenon of hunting in alternator
- iii. Explain in details Submersible Motor.
- iv. Define the importance of slip.
- v. What are the necessary conditions for parallel operation of alternator?
- vi. Can an induction motor run at a Synchronous speed?
- vii. How the synchronous motor is made self-starting?

**SECTION-C**

**3x7=21**

**Q3. Attempt any three questions.**

- a. Explain the construction, working and application of double cage induction motor.
- b. With a neat sketch explain the construction and working principle of a Schrage motor.
- c. What is universal motor? Compare its constructional features with those of an ordinary D.C series motor.
- d. Explain with a sketch the construction and working of linear induction motor.
- e. What is a Servo motor? Explain various types of servo motors.

S. B. Roll. No.....

**ELECTRICAL MACHINES-I**  
**4<sup>th</sup> Exam/Elect/3529/May'25**  
**(For 2018 Batch Onwards)**

**Duration: 3Hrs.**

**M.Marks:75**

**SECTION-A**

**Q1. Fill in the blanks.**

**15x1=15**

- a. \_\_\_\_\_ motor has high starting torque.
- b. A transformer has no \_\_\_\_\_ losses.
- c. Brushes of DC machines are made up of \_\_\_\_\_.
- d. The transformer tank is usually made of \_\_\_\_\_.
- e. Conservator is not found in \_\_\_\_\_ cooled transformer.
- f. Winding to earth faults may be caused due to \_\_\_\_\_.
- g. For large power transformer, it is preferable to use \_\_\_\_\_.
- h. Transformer oils used as \_\_\_\_\_.
- i. Eddy current in a transformer can be minimised by \_\_\_\_\_.
- j. Very small transformer is generally \_\_\_\_\_ cooled.
- k. D.C. series motor is used for \_\_\_\_\_.
- l. The laminations of D.C. machine armature are provided to reduce \_\_\_\_\_.
- m. Synchronous motor is \_\_\_\_\_ starting.
- n. Induction motor cannot run at \_\_\_\_\_ speed.
- o. The unit of self-inductance is \_\_\_\_\_.

**SECTION-B**

**Q2. Attempt any six questions.**

**6x5=30**

- i. Explain the working principle of a transformer.
- ii. Explain what is meant by voltage regulation.
- iii. Which losses occur in a D.C. machine?
- iv. Why is a starter necessary for a D.C. motor?
- v. What happened when D.C. voltage applied to the primary of a transformer?
- vi. What are the applications of DC motor?
- vii. How an expression for the efficiency of the transformer is obtained?
- viii. What is back e.m.f.? Explain its significance.

**SECTION-C**

**Q3. Attempt any three questions.**

**3x7=21**

- a. Explain the construction & working of a three –phase transformer.
- b. Explain with neat sketch the working of a three point D.C. shunt motor starter including the protective relays, i.e. no volt coil as well as overload coil.
- c. Explain the construction & working of an auto transformer.
- d. Explain the various methods of cooling of transformer.
- e. Describe Swinburne's test with the help of a neat diagram to find out the efficiency of a D.C. machine. What are the advantages & disadvantages of this test?

S. B. Roll. No.....

**INDUSTRIAL ELECTRONICS & CONTROL OF DRIVES**  
**4<sup>th</sup> Exam/Elect/4525/May'25**  
**(For 2018 Batch Onwards)**

Duration: 3Hrs.

M.Marks:75

**SECTION-A**

**Q1. Do as directed.**

**15x1=15**

- a. SCR is \_\_\_\_\_ layer device.
- b. Holding current is \_\_\_\_\_ than latching current.
- c. The most commonly used method for firing an SCR is \_\_\_\_\_.
- d. Turning off process of SCR is known as \_\_\_\_\_.
- e. A DIAC is USED to \_\_\_\_\_ TRIAC.
- f. Numbers of SCR used in single phase fully controlled bridge converter are \_\_\_\_\_.
- g. FD stands for \_\_\_\_\_.
- h. A \_\_\_\_\_ converter operates in four quadrants.
- i. A chopper converts constant \_\_\_\_\_ to variable \_\_\_\_\_.
- j. UPS stands for \_\_\_\_\_.
- k. In choppers 'α' is known as \_\_\_\_\_.
- l. \_\_\_\_\_ Commutation is used in controlled rectifiers.
- m. TRIAC is \_\_\_\_\_ directional device.
- n. Cycloconverter changes \_\_\_\_\_ frequency to \_\_\_\_\_ frequency.
- o. Numbers of junctions in UJT are \_\_\_\_\_.

**SECTION-B**

**Q2. Attempt any six questions.**

**6x5=30**

- i. Explain various methods of triggering SCR.
- ii. Explain the construction and characteristics of DIAC.
- iii. What do you mean by heat sink?
- iv. Explain string efficiency and derating factor.
- v. Explain snubber circuit
- vi. Explain control strategies of choppers.
- vii. Write a note on Cycloconverter.
- viii. Explain the construction and working of series inverter.
- ix. Explain the construction and characteristics of UJT.

**SECTION-C**

**Q3. Attempt any three questions.**

**3x10=30**

- a. Explain RC triggering of SCR with circuit diagram.
- b. Explain single phase half wave converter with inductive load with waveforms and mathematical expression.
- c. Explain the dual converters.
- d. Explain step up chopper.
- e. What is the necessity of UPS, explain in detail ON-LINE UPS?

S. B. Roll. No.....

**ELECTRICAL MEASURING INSTRUMENTS AND INSTRUMENTATION**  
**4<sup>th</sup> Exam/Elect/4520/May'25**  
**(For 2018 Batch Onwards)**

**Duration: 3Hrs.**

**M.Marks:75**

**SECTION-A**

**Q1. Do as directed.**

**15x1=15**

- a. Wattmeter measures the electrical power consumed by a \_\_\_\_\_ in an electric circuit.
- b. C.T is used in conjunction with \_\_\_\_\_
- c. In indicating type instruments damping torque is always opposes the \_\_\_\_\_.
- d. Secondary of a CT is never \_\_\_\_\_ circuited.
- e. Creeping is the phenomenon which occurs in \_\_\_\_\_
- f. Digital instruments are free from \_\_\_\_\_ and \_\_\_\_\_.
- g. A device that converts a physical quantity into an electrical signal is called \_\_\_\_\_.
- h. PMMC instruments can be used for \_\_\_\_\_ measurements only.
- i. The resistance of earth electrode should be \_\_\_\_\_
- j. The range of ammeter can be exceeds with the help of \_\_\_\_\_
- k. Energy meter is an \_\_\_\_\_ Type instrument.
- l. CRT stands for \_\_\_\_\_
- m. \_\_\_\_\_ is used for measurement of insulation resistance.
- n. Voltmeter is always connected in \_\_\_\_\_ with the load.
- o. VTVM stands for \_\_\_\_\_

**SECTION-B**

**Q2. Attempt any six questions.**

**6x5=30**

- i. Give the constructional details of dynamometer type wattmeter.
- ii. Explain the working of inductive transducer.
- iii. Explain the construction and working principle of CT.
- iv. Describe the construction and working of megger.
- v. Draw the block diagram of digital multimeter and its applications.
- vi. Write some merits and demerits of single phase energy meter?
- vii. Explain the construction and working principle of LVDT.

**SECTION-C**

**Q3. Attempt any three questions.**

**3x10=30**

- a. Explain construction and working principle of single phase power factor meter.
- b. Describe the construction and working of a permanent magnet moving coil type instrument with a neat sketch.
- c. Draw and explain the block diagram of CRO and mention its applications.
- d. Write short notes on any two: i) Clamp on meter    ii) Thermocouple    iii) Earth tester