

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

NON-CONVENTIONAL ENERGY SOURCES
3rd Exam/Elect/5800/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. _____ is burned to release its stored energy.
- b. The operation of solar cell is based on the _____ effect.
- c. An efficient greenhouse effect is possible only below _____ °C.
- d. The _____ is the most important component of hydroelectric power plant.
- e. The anaerobic fermentation process is _____ dependent.
- f. A digester is also called _____.
- g. A windmill works on the principle of converting _____ energy of wind to _____ energy.
- h. Binary cycle system is basically a _____ cycle.
- i. Hybrid cycle is a combination of _____ and _____ cycle.
- j. A fuel cell is a device which directly converts mechanical energy into electrical energy. (T/F)
- k. Solar cells are joined in parallel to form module. (T/F)
- l. Biomass, when burned, does not release greenhouse gases. (T/F)

SECTION-B

Q2. Attempt any five questions.

5x4=20

- i. Write a short note on alternative sources of energy.
- ii. Explain principle of working of solar furnace.
- iii. Draw and explain the components of hydroelectric power plant.
- iv. What is the difference between biomass and biogas?
- v. Name all the main factors taken into consideration in the WECS site selection.
- vi. Write some advantages and disadvantages of geo-thermal energy.
- vii. Explain the working principle of MHD generator.

SECTION-C

Q3. Attempt any three questions.

3x7=21

- a. Explain the following: i) Solar cookers ii) Solar water heaters
- b. What are the turbines and generators used for small scale hydro-electric power plant?
- c. Explain different types of Biogas plants
- d. Explain advantages, disadvantages and applications of wind energy.
- e. Explain with neat sketches the open cycle and closed cycle ocean thermal electric power generation.

S.B. Roll No.....

ELECTRONIC DEVICES AND CIRCUITS
3rd Exam/Elect/5802/May'25
(For 2023 Batch Onwards)

Duration: 3Hrs.

M.Marks:50

SECTION-A

Q1. Do as directed any nine of the following.

9x1=9

- The materials which allow the passage of electric current through them easily are called _____
- The process of adding impurity to intrinsic semiconductors is called _____
- Extrinsic semiconductors are the purest form. (T/F)
- Emitter is region which injects the _____ carriers into transistor.
- The emitter region is mediumly doped and largest in area. (T/F)
- The phase difference of 180 degree between the input signal voltage and the output voltage in a common emitter amplifier is known as _____
- In JFET's the current conduction is either by _____ or _____
- In IGFETs the gate terminal is insulated from the channel.
- The MOSFET is also known as INSULATED GATE FIELD EFFECT TRANSISTOR (IGFET). (T/F)
- When emitter base junction is forward-biased and collector base junction is reverse biased, is called _____ region
- Ripple factor is defined as the ratio of RMS value of AC component to the DC component. (T/F)
- A _____ is that straight line which represents graphically the relationship between the output voltage and current.

SECTION-B

Q2. Attempt any five questions.

5x4=20

- What do you mean by doping?
- Write short note on intrinsic and extrinsic semiconductors.
- Why CE is the most preferred transistor configuration.
- Explain advantages and disadvantages of RC coupling scheme.
- Write down some advantages of FETs over BJTs.
- Explain how P-TYPE semiconductors are formed.
- Describe various coupling used in multistage amplifier.

SECTION-C

Q3. Attempt any three questions.

3x7=21

- Explain the working of NPN transistor with diagram.
- Explain terms : i) Frequency response ii) Decibel gain iii) Bandwidth
- Differentiate between JFET and ordinary transistor.
- Write a short note on performance parameters of Zener diode?
- Draw and explain working of centre tap full wave rectifier.

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

ELECTRICAL MACHINES-I
3rd Exam/Elect/5801/May'25
(For 2023 Batch Onwards)

Duration: 3Hrs.

M.Marks:50

SECTION-A

Q1. Do as directed any nine of the following.

9x1=9

- The magnitude of induced magnetic flux, is directly proportional to the rate of change of _____
- In generating action, current flows in _____ direction as that of induced EMF.
- The yoke of a D.C. machine is made of _____
- The brushes for commutator are made of _____
- Maximum efficiency occurs when variable losses are _____ to constant losses.
- In D.C. machines, brushes are placed on _____
- Lap winding is suitable for _____ current, but _____ voltage generators.
- For an ideal transformer, Input power = _____
- For maximum efficiency of a transformer, variable copper loss is equal to _____.
- _____ relay is placed in-between the tank and conservator.
- The colour of silica gel is _____ when dry and _____ when wet.
- The transformer tank is usually made of _____

SECTION-B

Q2. Attempt any five questions.

5x4=20

- Why an electrical motor or generator is also called electro-mechanical conversion device?
- Why shunt field resistance should not be more than critical resistance?
- Can we use wood for the construction of yoke of a DC machine? State why?
- What are the advantages of using a large number of poles in a DC machine?
- Why low voltage winding is always placed nearer the core?
- What advantage has the star-connection over the delta connection?
- Why transformer cannot be used on D.C.

SECTION-C

Q3. Attempt any three questions.

3x7=21

- Explain cooling of transformers.
- Explain efficiency of transformer. Derive condition of its maximum efficiency.
- Explain characteristics of DC series motors.
- What is the necessity of a starter in DC motors? Explain three point starters.
- Explain development of torque by the alignment of two fields when soft iron piece is placed in the magnetic field.

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

GENERIC SKILLS ENTREPRENEURSHIP DEVELOPMENT
3rd Exam/Elect/5285/May'25
(For 2018 Batch Onwards)

Duration: 3Hrs.

M.Marks:75

SECTION-A

Q1. Fill in the blanks.

15x1=15

- a. LLL stands for _____
- b. GSD stands for _____
- c. _____ is the way in which one perceives oneself.
- d. _____ are distinguished qualities or characteristics of a person.
- e. _____ includes emotional, social and psychological health.
- f. _____ refers to make best use of time.
- g. _____ contains highlights of resume in a short and attractive manner.
- h. _____ Management starts with identifying the source of stress in your life.
- i. Feeling which is produced from heart is called _____.
- j. _____ is the ability to imagine being in another person's situations and therefore understands his/her feeling.
- k. _____ is ability to motivate a group of people towards a common goal.
- l. In _____ phase, customer evaluates his or her satisfaction with the project.
- m. A _____ is an opportunity for improvement.
- n. An entrepreneur is the one who assumed the _____ and _____ of business.
- o. Perceiving, analysis and selection are the _____ of an entrepreneur.

SECTION-B

Q2. Attempt any six questions.

6x5=30

- i. What are generic skills? Discuss its importance.
- ii. What do you understand by self development? Explain.
- iii. What are personal grooming and its importance?
- iv. What is a resume? Explain with suitable example.
- v. What do you mean by stress? Explain its causes.
- vi. Explain different types of organizational structures.
- vii. Explain task and task management.
- viii. Explain concept of problem solving.

SECTION-C

Q3. Attempt any three questions.

3x7=21

- a. Explain the concept, functions and characteristics of an entrepreneur. What is its significance?
- b. Explain personality with its fundamental characteristics. Give some tips for personality development.
- c. What is mock interview? Explain various factors to prepare for mock interview.
- d. What are the barriers to effective organizational communication?
- e. Explain the terms Sympathy and Empathy with examples.

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

FUNDAMENTALS OF ELECTRICAL ENGINEERING
3rd Exam/Elect/5230/May'25
(For 2018 Batch onwards)

Duration: 3Hrs.

M.Marks:75

SECTION-A

Q1. Fill in the blanks.

15x1=15

- a. The unit of specific resistance is _____.
- b. Reciprocal of resistance is known as _____.
- c. By connecting resistance in parallel the total resistance _____.
- d. Norton's theorem is the _____ of Thevenin's theorem
- e. The domestic installation is connected in _____.
- f. The reluctance of magnetic circuit is similar to _____ of an electric circuit.
- g. A graph between flux density And magnetising force is known as _____.
- h. In lead-acid cell the electrolyte is _____.
- i. The open circuit potential difference of a cell is called as _____.
- j. The unit of magnetic flux is _____.
- k. The most important wave shape of an AC, in practice is _____ wave.
- l. In a pure inductance the voltage _____ the current by 90°
- m. Average power dissipated in pure capacitor is _____.
- n. The term $\cos\Phi$ in power equation is known as _____ of the circuit.
- o. Admittance is reciprocal of _____.

SECTION-B

Q2. Attempt any six questions.

6x5=30

- i. Explain the differences between AC and DC. Draw their wave form w.r.t. time.
- ii. Three resistances of value R ohms are connected in STAR. Find their DELTA equivalent.
- iii. A coil has 800 turns. Find the induced e.m.f. in this coil, if the flux changed from 0.2 m Wb to 1 m Wb in 0.1 second.
- iv. State and explain Kirchhoff's laws.
- v. Explain the advantages of good power factor.
- vi. Explain what you understand by the term "Hysteresis" with reference to magnetism.
- vii. Write a note on dynamically induced emf.
- viii. Explain MMF, FLUX, RELUCTANCE with reference to magnetic circuit
- ix. Define the following terms used in AC circuits: a) cycle b) amplitude c) time period

SECTION-C

Q3. Attempt any three questions.

3x10=30

- a. State and explain super position theorem.
- b. Drive the expression for the force between two parallel current carrying conductors.
- c. A coil of inductance 100mH and resistance of 100 ohms is connected to 230v, 50Hz supply. Calculate
i) Impedance ii) current iii) Phase angle between I and V iv) power factor of the circuit v) draw phasor diagram
- d. Explain the constant current and constant voltage method of charging a battery. Which method is employed commercially and why?
- e. i) What do you mean by real power, reactive power and apparent power?
ii) What do you mean by self induced emf and mutually emf?

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

ELECTRICAL & ELECTRONICS ENGINEERING MATERIALS
3rd Exam/Elect/5257/May'25
(For 2018 Batch Onwards)

Duration: 3Hrs.

M.Marks:75

SECTION-A

15x1=15

Q1. Give answer in one line.

- a. Give examples of Conductor materials.
- b. What is resistivity?
- c. Nichrome is an alloy of which materials?
- d. What is the full form of ACSR?
- e. What is the effect of moisture on insulation resistance of an insulator?
- f. Define Semiconductor.
- g. Which ceramic material is widely used in making line insulators?
- h. Define Permeability.
- i. What are thermosetting plastics?
- j. On what effect does a thermocouple work?
- k. Give classification of Magnetic materials.
- l. Why the armature core is laminated?
- m. Which types of conductors have zero resistance?
- n. Define soldering.
- o. What are the basic types of rubbers?

SECTION-B

6x5=30

Q2. Attempt any six questions.

- i. Explain the classification of solids on the basis of Energy band theory.
- ii. Write a short note on Diamagnetic materials.
- iii. Explain the terms: a) Dielectric strength b) Volume resistivity
- iv. Explain the various properties of low resistivity conducting materials.
- v. What are the various thermal properties of Insulating materials?
- vi. Write a short note on thermo-couples.
- vii. Give classification of electrical engineering materials.
- viii. Write a short note on Thermoplastics.
- ix. Write a short note on Intrinsic & Extrinsic semi-conductors.
- x. Write short note on Superconductors.

SECTION-C

3x10=30

Attempt any three questions.

Q3. a) Write the applications of following (any 3 materials):

- i) Glass ii) Mica iii) Porcelain iv) Nichrome v) Platinum vi) Tungsten
- b) Describe briefly about ACSR conductors.

Q4. Describe the various varnishes used for electrical purposes. Write their uses also.

Q5. a) Name at least 5 parts of a DC machine & the material used for construction of those parts.
b) Discuss the properties of semiconductors.

Q6. Explain the classification of magnetic materials. Also explain some of the properties of magnetic materials.

Q7. Write short notes on the following.

- i) Permeability ii) Chemical properties of insulating materials.

P.S.B.T.E. & I.T.

Library

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

ANALOG ELECTRONICS
3rd Exam/Elect./6521/May'25
(For 2018 Batch Onwards)

Duration: 3Hrs.

M.Marks:75

SECTION-A

Q1. Fill in the blanks.

15x1=15

- a. With addition of pentavalent impurity, the semiconductor obtained is called _____.
- b. In p-type semiconductor majority carriers are _____.
- c. L.E.D. stands for _____.
- d. The value of knee voltage for silicon diode is _____ volts.
- e. An ideal diode has _____ forward resistance.
- f. A _____ diode is usually used as voltage regulator.
- g. _____ Diode has a negative resistance.
- h. In a transistor, there are _____ pn junctions.
- i. The base of a transistor is _____ doped.
- j. For impedance matching generally _____ configuration is used. cc
- k. The ideal value of stability factor is _____.
- l. A transistor with its associated circuitry for amplification is called a _____.
- m. The point of intersection of dc and ac load line is called _____.
- n. An R-C coupling is used for _____ amplification.
- o. In an n-channel FET, the current conduction is due to _____ charge carriers.

SECTION-B

Q2. Attempt any six questions.

6x5=30

- i. What is the process of doping in semiconductors?
- ii. Draw and explain V-I characteristics of a P-N junction diode.
- iii. What is the use of filter circuit? List different types of filters.
- iv. Explain the mechanism of current flow in NPN transistor.
- v. Explain the need for biasing a transistor.
- vi. What are AC and DC load lines in transistor circuits?
- vii. Write a short note on h-parameters of a transistor.
- viii. Differentiate between FET and BJT.

SECTION-C

Q3. Attempt any three questions.

3x10=30

- a. With the help of suitable diagrams, explain the functioning of a full-wave rectifier.
- b. Explain Zener diode, its characteristics and applications.
- c. Explain the voltage-divider biasing circuit.
- d. Draw the circuit diagram of RC coupled amplifier and explain its working and applications.
- e. Describe the construction, operation and characteristics of MOSFET.

P.S.B.T.E. & I.T.