

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2019

**ELECTRICAL TECHNOLOGY**

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Define time period.
2. Write voltage transformation ratio of a transformer.
3. How can limit Eddy Current Loss ?
4. Which starter is suitable for starting of a DC series motor.
5. List any two advantages of poly phase motor.

(5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. Derive the equation impedance, power and power factor of RLC series circuit.
2. State and explain maximum power transfer theorem.
3. Explain the different types of losses in a transformer.
4. Classify DC generators based on its field excitation.
5. Derive the EMF equation of a DC generator.
6. Compare Single phase and three phase induction motor.
7. State the advantages of stationary armature in an alternator.

(5×6 = 30)

## PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

## UNIT — I

- III (a) A circuit having a resistance of 12 Ohms an inductance of 0.15 H and capacitance of 100 Micro Farads connected in series across a 100 V, 15 Hz supply. Calculate the impedance, current, power factor and power consumed. 8
- (b) Draw and explain plate earthing. 7

OR

- IV (a) Define the terms - Inductive reactance, Capacitive reactance, Impedance, Power Factor. 8
- (b) An inductance of 0.03H is connected in series with a 4 Ohms resistance. Calculate impedance, current power factor when connected across 200V, 50 Hz Supply. 7

## UNIT — II

- V (a) Illustrate the on load working of a transformer. 8
- (b) State and explain Kirchoff's Law. 7

OR

- VI (a) A 25KVA single phase transformer has a 250 turns on the primary and 40 turns on the secondary winding. The primary is connected to 1500V, 50Hz mains. Calculate
- (i) Primary & Secondary Current on full load
- (ii) Secondary EMF
- (iii) Maximum Flux in the core 8
- (b) Explain the working of a auto transformer and list its advantages. 7

## UNIT — III

- VII (a) Explain the principal of operation of DC generator. 8
- (b) Explain the necessity of starter in a DC motor starting. 7

OR

- VIII (a) A 6 pole lap wound DC generator has 600 conductors on its armature. The flux per pole is 0.02 wb. Calculate
- (i) The speed at which the generator must be run to generate 300 V.
- (ii) What would be the speed if the generator were wave wound ? 8
- (b) Draw and explain the characteristics of DC shunt motor. 7

## UNIT — IV

- IX (a) Explain the construction and working of a capacitor start induction run motor. 8
- (b) To explain the relation between speed and frequency of an alternator. 7

OR

- X (a) Derive the EMF equation of an alternator. 8
- (b) Compare squirrel cage and slip-ring induction motor. 7

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2019**

**ELECTRONIC DEVICES AND CIRCUITS**

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. List different methods of inter stage coupling in amplifiers.
2. Write an expression for resonant frequency of resonant circuits.
3. Define piezo electric effect.
4. State Barkhausen criterion for oscillation.
5. List types of negative feedback in amplifiers.

(5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. Explain emitter follower with the help of diagram.
2. Explain the effects of negative feedback in amplifiers.
3. Compare BJT and FET.
4. Explain importance of impedance matching in power amplifier.
5. Draw the circuit diagram of direct coupled amplifier and explain.
6. Explain importance of heat sink in power amplifier.
7. Draw and explain RC differentiating circuit with waveforms.

(5×6 = 30)

## PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

## UNIT — I

- III (a) Explain the principle of operation of transistor amplifier in Common emitter configuration. 8
- (b) Explain frequency response of RC coupled amplifier. 7

OR

- IV (a) Write expression for voltage gain, current gain, power gain, input and output impedances of common emitter amplifier. 8
- (b) Draw and explain transformer coupled amplifier. 7

## UNIT — II

- V (a) Draw and explain the circuit of complimentary push pull amplifier. 8
- (b) Explain frequency response of single tuned amplifier and write Relation between resonant frequency, bandwidth and Q factor. 7

OR

- VI (a) Classify power amplifiers with the help of proper diagrams. 8
- (b) Draw and explain single tuned amplifier circuit. 7

## UNIT — III

- VII (a) Derive an expression for feedback in amplifiers. 8
- (b) Explain the working principle of JFET. 7

OR

- VIII (a) Explain the types of negative feedback in amplifiers with the help of diagrams. 8
- (b) Draw and explain UJT relaxation oscillator. 7

## UNIT — IV

- IX (a) Explain the working of RC phase shift oscillator with the help of diagram. 7
- (b) Explain the working of Schmitt trigger with the help of Circuit diagram and waveforms. 8

OR

- X (a) Draw and explain Hartley oscillator. 7
- (b) Explain the operation of transistor astable multivibrator with the help of circuit diagram and waveforms. 8

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2019

**DIGITAL ELECTRONICS**

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Convert binary number 101101 is equal to hexadecimal number.
2. List two alpha numeric codes.
3. List any two features of CMOS logic family.
4. Draw SR flip flop using NAND gate only.
5. Define resolution and accuracy for an ADC.

(5 × 2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. State and explain Demorgan's theorems.
2. Draw and explain the operation of 4 × 1 Multiplexer.
3. Draw and explain the working principle of CMOS NAND gate.
4. State the race around condition and methods to overcome the problem.
5. Draw and explain the working of ring counter.
6. Explain Weighted resistor DAC.
7. Differentiate between synchronous and asynchronous counters.

(5 × 6 = 30)

## PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

## UNIT — I

- III (a) Implement AND, OR, NOT, EXOR and EXNOR using NAND gate. 10  
 (b) List the advantages and disadvantages of K-map. 5

OR

- IV (a) Simplify using K-map  
 $\Sigma m(4,5,7,8,10,11,13,14) + \Sigma d(0,1,2)$  10  
 (b) Write short note on excess-3 code. 5

## UNIT — II

- V (a) Explain the circuit of TTL inverter. 8  
 (b) Draw and explain the operation of 3 bit encoder. 7

OR

- VI (a) Define the terms Noise margin, noise immunity, propagation delay, fan-in and fan-out. 10  
 (b) Draw and explain parallel adder. 5

## UNIT — III

- VII (a) Explain the working of master slave JK flip flop. 8  
 (b) Explain the working of Johnson counter and its applications. 7

OR

- VIII (a) Explain D and T flip flops. 8  
 (b) Explain the working of different types of shift registers. 7

## UNIT — IV

- IX (a) Explain mod-8 synchronous down counter using JK flip flop. 9  
 (b) List the different types of ADC and DAC. 6

OR

- X (a) Explain mod-10 asynchronous counter using JK flip flop. 9  
 (b) Explain Counter type ADC. 6

DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2019  
**COMMUNICATION ENGINEERING**

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Define - Skip Distance.
2. Draw the modulated waveform of FM.
3. Define signal to noise ratio.
4. Write the expansion of AFC.
5. Define Selectivity.

(5 × 2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. Explain Space Wave Propagation.
2. What is MANET and write its applications ?
3. What are the needs for modulation ?
4. State sampling theorem and mention its significance.
5. Explain Pre-Emphasis and De-Emphasis.
6. What are the needs for Demodulation ?
7. Explain AM demodulation circuit using Diode Detector.

(5 × 6 = 30)

## PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

## UNIT — I

- III (a) List the Layers of Ionosphere and explain. 8  
 (b) Explain Ground Wave Propagation. 7

OR

- IV (a) Name the Atmospheric effects of Electromagnetic radiation and explain. 9  
 (b) Explain the working of Half Wave Dipole Antenna. 6

## UNIT — II

- V (a) Deduce the expression for Amplitude Modulated Wave. 9  
 (b) Explain PAM and PWM. 6

OR

- VI (a) Draw and explain Pulse Code Modulation system. 9  
 (b) List the different Digital Carrier Modulation Schemes and draw the waveforms. 6

## UNIT — III

- VII (a) With the help of a block diagram explain AM Transmitter. 10  
 (b) List different types of noises. 5

OR

- VIII (a) With the help of a block diagram explain Direct FM Transmitter. 9  
 (b) Explain how to improve signal to noise ratio. 6

## UNIT — IV

- IX (a) Draw and explain Super Heterodyne Receiver. 9  
 (b) Write a short note on simple AGC. 6

OR

- X (a) Draw and explain FM Receiver. 9  
 (b) Compare AM & FM Receivers. 6
-



**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/  
MANAGEMENT/COMMERCIAL PRACTICE — APRIL, 2019**

**ENVIRONMENTAL SCIENCE AND DISASTER MANAGEMENT**

[Time : 3 hours

(Maximum marks : 100)

PART — A

(Maximum marks : 10)

Marks

I Answer *all* questions in one or two sentences. Each question carries 2 marks.

1. Define deforestation.
2. Define ecosystem.
3. Describe solid waste.
4. Define disaster.
5. Describe TREM card.

(5×2 = 10)

PART — B

(Maximum marks : 30)

II Answer any *five* of the following questions. Each question carries 6 marks.

1. Explain the uses of forest.
2. Point out the characteristics features of grassland ecosystem.
3. Discover the effects of noise pollution.
4. Discuss the causes of flood.
5. List the environmental effects of pesticides.
6. Describe biomagnification.
7. Discuss the control measures of marine pollution.

(5×6 = 30)

PART — C

(Maximum marks : 60)

(Answer *one* full question from each unit. Each full question carries 15 marks.)

UNIT — I

- |     |  |   |
|-----|--|---|
| III | (a) Explain the effect of dams on forest.                | 8 |
|     | (b) Describe the importance of alternate energy sources. | 7 |

OR

- IV (a) Discuss the role of an individual in the conservation of natural resources. 8  
(b) Point out the environmental effects of mining. 7

## UNIT — II

- V (a) State the importance of biodiversity conservation. 8  
(b) Explain the structure and function of desert ecosystem. 7

OR

- VI (a) Explain a food chain with suitable example. 8  
(b) Describe the effect of urbanization on environment. 7

## UNIT — III

- VII (a) Describe the effects of water pollution. 8  
(b) Explain a method to control air pollution. 7

OR

- VIII (a) Describe the causes of thermal pollution. 8  
(b) Explain the effects of nuclear pollution. 7

## UNIT — IV

- IX (a) Describe the emergency phase of disaster management cycle. 8  
(b) What are the sources of chemical disaster ? 7

OR

- X (a) Explain effects of cyclone. 8  
(b) Explain the uses of information technology in disaster management. 7
-