TED (21) – 2031 REVISION 2021

SECOND SEMESTER DIPLOMA EXAMINATION IN ENGINEERING
AND TECHNOLOGY
(Common to BM / EE / IE / PT / TT / CC / CF / CM / CN / CT /
EC / EL / IF / PL / RA / RE / RP)

FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGINEERING

MODEL QUESTION PAPER – SET-1

Time: 3 hours Maximum Marks: 75

PART A

I. Answer all questions in one word or one sentence. Each question carries one mark.

(9 x 1 = 9 Marks)

1	Unit of resistance is _____	M1.01	R
2	Match the following (a) Series dc circuit — (A) Same voltage (b) Parallel dc circuit — (B) Same current	M1.02	R
3	Commercial unit of electrical energy is _____	M2.03	R
4	Electrical appliances are _____ to protect the operator from electric shock	M2.04	R
5	The character code displayed on a resistor is 2E5. What is the value of this resistor?	M3.01	A
6	A number 223 is typed on the body of a capacitor. Find out the actual capacitance value.	M3.02	A
7	List any two materials used for making semiconductor diodes	M4.01	R
8	Draw the symbol of Zener diode	M4.02	R
9	Draw the structure of PNP transistor	M4.03	R

PART B

II. Answer any eight questions from the following. Each question carries 3 marks

(8 x 3 = 24 Marks)

<table>
<tr><td>1</td><td>Explain generation of single phase sinusoidal ac voltage</td><td>M1.03</td><td>U</td></tr>
<tr><td>2</td><td>Define service connection and state its purpose.</td><td>M2.01</td><td>U</td></tr>
<tr><td>3</td><td>Match the followings and arrange the table properly with respect to a single phase ac circuit
<table><tr><td>Parameter</td><td>Equations</td><td>Units</td></tr><tr><td>(a1) Active power</td><td>(a2) VI Sin ϕ</td><td>(a3) VAR</td></tr><tr><td>(b1) Reactive power</td><td>(b2) VI Cos ϕ</td><td>(b3) VA</td></tr><tr><td>(c1) Apparent power</td><td>(c2) VI</td><td>(c3) W</td></tr></table></td><td>M2.02</td><td>U</td></tr>
<tr><td>4</td><td>A Motor takes 4 Amperes at 250 volts. Find the number of units consumed if this motor is operated for 2 hours.</td><td>M2.03</td><td>A</td></tr>
<tr><td>5</td><td>State the importance of electric safety in a work place</td><td>M2.04</td><td>U</td></tr>
<tr><td>6</td><td>List any three applications of inductors.</td><td>M3.03</td><td>R</td></tr>
<tr><td>7</td><td>Explain the operation of a semiconductor diode under following conditions
(a) Forward biased
(b) Reverse biased</td><td>M4.01</td><td>U</td></tr>
<tr><td>8</td><td>List any three applications of zener diode.</td><td>M4.02</td><td>R</td></tr>
<tr><td>9</td><td>Draw a neat diagram showing the biasing of various junctions of transistor in the active region</td><td>M4.03</td><td>U</td></tr>
<tr><td>10</td><td>List any three applications of logic gates.</td><td>M4.04</td><td>R</td></tr>
</table>

PART C

Answer all questions. Each question carries seven marks

(6 x 7 = 42 Marks)

<table>
<tr><td>III</td><td>State laws of resistance and mention the factors affecting resistances</td><td>M1.01</td><td>U</td></tr>
<tr><td></td><td>OR</td><td></td><td></td></tr>
<tr><td>IV</td><td>Draw a circuit containing three equal resistances of R Ohm in parallel .Also derive an expression for equivalent resistance for this circuit.</td><td>M1.02</td><td>U</td></tr>
<tr><td>V</td><td>State Faraday’s laws of electromagnetic induction</td><td>M1.03</td><td>R</td></tr>
<tr><td></td><td>OR</td><td></td><td></td></tr>
<tr><td>VI</td><td>Define the following with respect to an alternating voltage .Also draw an alternating voltage waveform and mark these parameters</td><td>M1.04</td><td>R</td></tr>
</table>

<table>
<tr><td></td><td>on it.

(a) Cycle
(b) Time period
(c) Maximum Value</td><td></td><td></td></tr>
<tr><td>VII</td><td>A single phase load at 220 V draws a current of 3A at a power factor of 0.8 lag.Calculate

(i)Active power
(ii)Apparent power
(iii)True power

OR</td><td>M2.02</td><td>A</td></tr>
<tr><td>VIII</td><td>A residential building has the following electrical load and appliances are operated as per the load details given . Calculate the following

a) Total connected load in kW
b) Energy consumption in kWh in one day
c) Monthly electricity bill for the month of april at the rate of Rs 3 per kWh

<table><tr><td>Sl No</td><td>Load details</td></tr><tr><td>(a)</td><td>4 Tube lights each 40 watts working 6 hours /day</td></tr><tr><td>(b)</td><td>An Electric Iron -750 watts working 1 hour/day</td></tr><tr><td>(c)</td><td>4 Fans each 60 watts working 10 hours /day</td></tr><tr><td>(d)</td><td>A Mixie -750 watts working 1 hour/day</td></tr></table></td><td>M2.03</td><td>A</td></tr>
<tr><td>IX</td><td>Explain colour coding of resistors by band system. Use this information to determine the value of resistors with following bands

(i) Brown Black Green Silver
(ii) Red Red Gold Gold

OR</td><td>M3.01</td><td>A</td></tr>
<tr><td>X</td><td>Three capacitors A, B, C have capacitances 10, 50 and 25 μF respectively. Calculate the total capacitance if they are connected in

(i) Series
(ii) Parallel</td><td>M3.02</td><td>A</td></tr>
</table>

XI	Define inductance of a coil and distinguish between self and mutual inductance. **OR**	M3.03	U
XII	Illustrate the working of transformer	M3.04	U
XIII	Illustrate with waveforms operation of full wave bridge rectifier circuits **OR**	M4.01	U
XIV	Draw the symbol and write the truth tables of following logic gates (i) OR gate (ii) XOR gate	M4.04	U

TED (21) – 2031 REVISION 2021

SECOND SEMESTER DIPLOMA EXAMINATION IN ENGINEERING
AND TECHNOLOGY
(Common to BM / EE / IE / PT / TT / CC / CF / CM / CN / CT /
EC / EL / IF / PL / RA / RE / RP)

FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGINEERING

MODEL QUESTION PAPER – SET-2

Time: 3 hours Maximum Marks: 75

PART A

I. Answer all questions in one word or one sentence. Each question carries one mark.

(9 x 1 = 9 Marks)

<table>
<tr><td>1</td><td>Match the following
<table><tr><td>(a) Current</td><td>(A) Ohm</td></tr><tr><td>(b) Voltage</td><td>(B) Ampere</td></tr><tr><td>(c) Resistance</td><td>(C) Watts</td></tr><tr><td>(d) Power</td><td>(D) Volts</td></tr></table></td><td>M1.01</td><td>R</td></tr>
<tr><td>2</td><td>Name of the scientist who discovered electromagnetic induction</td><td>M1.03</td><td>R</td></tr>
<tr><td>3</td><td>General expression for alternating voltage is _____</td><td>M1.04</td><td>R</td></tr>
<tr><td>4</td><td>The expanded form of ELCB is _____</td><td>M2.01</td><td>R</td></tr>
<tr><td>5</td><td>The active power in a single phase ac circuit is given by the expression _____</td><td>M2.02</td><td>R</td></tr>
<tr><td>6</td><td>Base unit used to measure inductance of a coil is _____</td><td>M3.03</td><td>R</td></tr>
<tr><td>7</td><td>Define turns ratio of a transformer</td><td>M3.04</td><td>R</td></tr>
<tr><td>8</td><td>A zener diode is usually operated in the _____ biased condition</td><td>M4.02</td><td>R</td></tr>
<tr><td>9</td><td>Draw the symbol of PNP transistor</td><td>M4.03</td><td>R</td></tr>
</table>

PART B

II. Answer any eight questions from the following. Each question carries 3 marks

(8 x 3 = 24 Marks)

1	State Ohms law and write its mathematical expression	M1.01	R
2	Write any three comparisons between electric circuit and magnetic circuit	M1.02	U
3	Explain with diagram generation of alternating voltage in a coil	M1.03	U
4	Define the followings with respect to an alternating voltage (a) Instantaneous value (b) Frequency	M1.04	R
5	State any three harmful effects of electric shock on a human body	M2.04	R
6	Define active and passive components. Give two examples for each	M3.01	R
7	Explain the classification of capacitors .	M3.02	U
8	Draw the symbol of an inductor and list any two specifications.	M3.03	R
9	List any three applications of transformers in electronics.	M3.04	R
10	Write the truth table of NOR Gate	M4.04	R

PART C

Answer all questions. Each question carries seven marks

(6 x 7 = 42 Marks)

III	Determine the equivalent resistance and total current taken by the circuit if two resistors of 8Ω and 4Ω are connected across a 16 V supply as follows (a)Parallel (b) Series.	M1.02	A
	OR		
IV	An alternating voltage is represented by the following expression. V= 25 Sin 628 t Calculate the following (a)Amplitude (b) Frequency (c) Time period	M 1.04	A

<table>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>V</td><td>A residential building has the following electrical load and appliances are operated as per the schedule . Calculate the followings

a) Total connected load in kW
b) Energy consumption in kWh in one day
c) Monthly electricity bill for the month of March at the rate of Rs 5 per kWh

<table>
<tr><th>Sl no</th><th>Item</th><th>Wattage</th><th>Nos</th><th>Daily operating hours</th></tr>
<tr><td>a</td><td>TV</td><td>60</td><td>1</td><td>6</td></tr>
<tr><td>b</td><td>Tube light</td><td>40</td><td>6</td><td>8</td></tr>
<tr><td>c</td><td>Heater</td><td>1000</td><td>1</td><td>2</td></tr>
<tr><td>d</td><td>Fan</td><td>60</td><td>4</td><td>4</td></tr>
<tr><td>e</td><td>Cooler</td><td>100</td><td>1</td><td>4</td></tr>
</table>

OR</td><td>M 2.02</td><td>A</td></tr>
<tr><td>VI</td><td>A circuit consisting of resistance 50Ω and inductive reactance 30Ω in series is supplied with an ac voltage of 250 V . Determine

(a) Impedance of the circuit
(b) Power factor of the circuit
(c) Active power</td><td>M 2.03</td><td>A</td></tr>
<tr><td>VII</td><td>List two classifications of conduit wiring system and explain each

OR</td><td>M 2.01</td><td>U</td></tr>
<tr><td>VIII</td><td>List any seven general safety precautions to be followed while working with electricity</td><td>M 2.04</td><td>U</td></tr>
<tr><td>IX</td><td>With neat sketch outline the constructional details of carbon composition resistor

OR</td><td>M 3.01</td><td>U</td></tr>
<tr><td>X</td><td>Define capacitance and explain any three specifications</td><td>M 3.02</td><td>U</td></tr>
<tr><td>XI</td><td>Draw the circuit of a half wave rectifier circuit and explain its operation with waveforms

OR</td><td>M 4.01</td><td>U</td></tr>
<tr><td>XII</td><td>Illustrate the operation of zener diode</td><td>M 4.02</td><td>U</td></tr>
</table>

XIII	Explain the basic operation of transistor as an amplifier with sketches. **OR**	M 4.03	U
XIV	Draw the symbol and write the truth table of following logic gates (i) AND gate (ii) NOT gate	M 4.04	U