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TED (21) -2031 (Revision- 2021)

A23-2106220063A

| Reg.No | | |
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DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/ COMMERCIAL PRACTICE – APRIL - 2023

FUNDAMENTALS OF ELECTRICAL & ELECTRONICS ENGINEERING

(Maximum Marks : 75)

[Time : 3 hours]

(9x1=9 marks)

PART-A

I. Answer all the following questions in one word or sentence. Each question carries 1 mark.

| | | Module Outcome | Cognitive level |
|---|--|-------------------|--------------------|
| 1 | State ohm's law. | M 1.01 | R |
| 2 | Given the equation for instantaneous voltage of an AC circuit as | M 1.04 | Α |
| | e(t)=100 Sin (314t), the maximum value of voltage is | | |
| 3 | The equation for power in a three phase AC circuit is | M2.02 | R |
| 4 | Commercial unit of electrical energy is | M2.03 | R |
| 5 | | M3.01 | А |
| | The colour coding on the above resistor are as follows | | |
| | Band 1=Brown | | |
| | Band $2 = Black$ | | |
| | Band $3 = $ Orange, | | |
| | Band $4 = \text{Gold}$ | | |
| | The resistance value is | | |
| 6 | Three capacitors 4,6,7 micro farads connected in parallel, the | M3.02 | U |
| 7 | | M4.01 | Ъ |
| / | I ne device used to convert AC to DC is called as | M4.01 | К |
| 8 | Draw the symbol of Zener diode. | M4.02 | R |
| 9 | Transistor work as an amplifier when it is operated in | M4.03 | R |
| | region. | | |

PART B

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

| | | (8x3=24) | |
|---|---|----------|-----------|
| | | Module | Cognitive |
| | | Outcome | level |
| 1 | With a neat diagram explain the generation of alternating voltage | M 1.03 | U |
| | in a coil placed in a magnetic field. | | |
| 2 | Define service connection and state its purpose. | M 2.01 | U |
| | | | |



| 3 | Explain Active | power, Reactive | e Power and Apparen | t Power with | M2.02 | R |
|----|---|--|-------------------------|--------------|----------|---|
| | respect to single | e phase AC circu | iit. | | | |
| 4 | Three 60 W lan | Three 60 W lamps connected across a 230 V supply. Find the | | M2.03 | Α | |
| | number of Unit | s consumed if th | e three lamps are ope | erated for | | |
| _ | 5hrs. | | <u> </u> | | 2.62.0.4 | |
| 5 | State the impor | tance of electric | safety in a work plac | e. | M2.04 | R |
| 6 | List the classifi | cation of Resisto | prs. | | M3.01 | R |
| 7 | Write any three comparisons between half wave and full wave | | M4.01 | R | | |
| 8 | Draw the symb | ol of semicondu | ctor diode and illustra | ate its | M4.01 | U |
| | operation under | r forward biased | condition. | | | |
| 9 | List any three a | pplications of Ze | ener diode. | | M4.02 | R |
| 10 | Match the follo | wing | | | | |
| | | | | | | |
| | (a1) AND | (a2) $Y = A + B$ | ^ | | | |
| | | | (a3) a Y | | | |
| | | | | | M4.04 | R |
| | (b1) OR | (b2) Y= <u>AB</u> | (b3) • | | | |
| | | | | | | |
| | (c1)NAND | (c2) Y=AB | AV | | | |
| | | | (c3) B-2-1 | | | |
| | L | | | | | |
| | | | | | | |

PART C

Answer **all** questions from the following. Each question carries 7 marks.

(6x7=42marks)

| | | Module Outcome | Cognitive level |
|-----|--|-------------------|--------------------|
| III | Draw an alternating voltage waveform and mark the following | M 1.04 | U |
| | parameters on it. Write the Definition for each of them. | | |
| | 1. Frequency | | |
| | ii. Maximum value | | |
| | iii. Time period | | |
| | iv. Cycle | | |
| | OR | | |
| IV | Draw the circuit diagram of the following combinations of three | | |
| | resistors connected in | | TT |
| | (a) series | M11.02 | U |
| | (b) parallel | | |
| | Give any three comparison between these two circuits. | | |
| V | A resistor of 12Ω is connected in series with a combination of | | |
| | 15Ω and 20Ω resistor in parallel. When voltage of 120 V is | M1 02 | |
| | applied across the whole circuit, find | WI1.02 | A |
| | (a) the equivalent resistance of the combinations. | | |
| | (b) the total current taken from the supply | | |
| 1 | (c) are total callent and norm the supply. | | |



| | OR | | |
|------|---|--------|----|
| VI | An alternating voltage is represented by the following expression. | | |
| | V=100 Sin 628 t. | | |
| | Calculate the following | | |
| | (a) Amplitude (b) Frequency (c) Time period | M1.04 | А |
| | (d) instantaneous value of voltage at t=3s. | | |
| VII | A residential Building has the following electrical load and | | |
| | appliances are operated as per the load details given. Calculate | | |
| | the following. | | |
| | 1. Total Connected Load in kW. | M2 02 | |
| | 11. Energy Consumption in Kwn in one day. | M2.03 | А |
| | of Rs. 7 per kWh. | | |
| | Sl.No. Load Details | | |
| | 1 5 Tube lights each 60 watts working 8 | | |
| | hours/day | | |
| | 2 An electric Iron 750 Watts working 1 hour/day. | | |
| | 3 4 fans each 60 watts working 10 hours/day. | | |
| | 4 A Mixer- 750 Watts working 2 hours/day. | | |
| | OR | | |
| | A circuit consisting of resistance 70Ω and inductive reactance | | |
| VIII | 50Ω in series is supplied with an AC voltage of 300 V. | | |
| | Determine | M2.02 | Α |
| | (a) Impedance of the circuit | | |
| | (b) Power factor of the circuit | | |
| | (c) Active power. | | |
| IX | C Define inductance of a coil and distinguish between self and | | U |
| | mutual inductance. | | |
| | OR | | |
| Х | Summarize the working of a transformer. Also define the turns | M2 04 | ТT |
| | ratio of the transformer. | | U |
| XI | Define capacitance and explain any four specifications of | M3.02 | U |
| | capacitors. | | |
| VII | UK Explain colour coding of resistors by hand system with avamples | M3 01 | ΙT |
| | Specify the tolerance also | WI3.01 | U |
| VIII | Explain the marking of Explanation and the sectific provide in the | | IT |
| | Explain the working of Full wave bridge rectifier with circuit diagram and waveform | | U |
| | OR | | |
| XIV | Explain the basic operation of transistor as an amplifier with | M4.03 | U |
| | sketches. | | |
| | | | |
