MALLA REDDY UNIVERSITY

SCHOOL OF ENGINEERING

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

MINOR- II QUESTION BANK

UNIT-III

1. a) How a single phase transformer works? Explain.
   b) A 2200/220 V, 50Hz single phase transformer has emf per turn of approximately 10 V. Calculate a) the number of primary and secondary turns b) the cross-sectional area of the core if the maximum flux density is limited to 1.5 T.

2. Explain working Principle and operation of DC motor.

3. a) Derive an emf equation of a single-phase transformer.
   b) An Ideal 25 kVA transformer has 500 turns on the primary winding and 40 turns on secondary winding. The primary is connected to 3000 volts, 50 Hz supply.
   Calculate i) Primary and secondary currents on full load ii) Secondary emf
   iii) Maximum core flux

4. a) List out the applications of Induction motor, Stepper motor and BLDC motor.
   b) A Single Phase 2200/250 V, 50Hz Transformer has net core area of 36 cm^2 and maximum flux density of 6 Weber / m^2 . Calculate the number of turns on primary and secondary.

5. a) Explain the Constructional details of DC generator.
   b) Explain about the construction of single-phase Transformer.

6. a) Derive the Torque equation of DC motor.
   b) Calculate the value of Torque established by armature of a 4 pole motor having 774 conductors, 2 paths in parallel, 24 mwb flux per pole, when the total armature current is 50 A.

UNIT-IV

1. a) Illustrate the operation of Zener diode and explain its V−I characteristics.
   b) Draw the forward and reverse characteristics of a p-n junction diode and explain them.

2. a) Explain the operation of Center-tapped full wave rectifier with relevant waveforms.
   b) Derive expression for ripple factor for a full wave rectifier.

3. a) Explain the operation of Half Wave Rectifier with necessary waveforms.
   b) Compare Half wave rectifier and Full wave rectifier in any four aspects .

4. a) Explain the construction and principle of operation of NPN transistor with neat diagram.
   b) Explain the construction and principle of operation of PNP transistor with neat diagram.

UNIT-V

1. a) Convert the following numbers

   i) $(7562.45)_{10} = (X)_8$ ii) $(101001110)_2 = (X)_{16}$ iii) $(BDCE)_{16} = (x)_{10}$

   iv) $(754.25)_{10} = (X)_2$ v)$(11110111.010)_2 = (x)_{10}$

   b) Solve for X

   i) $(F3A7C2)_{16}=(X)_{10}$ ii) $(2AC5)_{16}=(X)_2$ iii) $(0.93)_{10}=(X)_8$

   iv) $(4057.06)_8=(X)_{10}$

2. a) Perform the following conversions $(476.64)_{10}=(X)_2=(X)_8$

   b) Convert $(946)_{10}$ into binary and Hexadecimal.

3. i) Convert the given Octal number $(2564.603)_8$ to Hexa decimal number.

   ii) Given that $(81)_{10} = (100)_b$, Find the value of b.

4. a) Solve for x

   i) $(367)_8=(x)_2$ (ii)$(378.93)_{10}=(x)_8$ (iii)$(B9F.AE)_{16}=(x)_8$ (iv) $(16)_{10}= (100)_x$

   b) Convert $(163.875)_{10}$ to binary, octal and hexa decimal.

   c) Perform binary subtraction by using 1's and 2 's complement method

   i) $(10101000)_2$ - $(11101000)_2$

   ii) $(111010)_2$ - $(110100)_2$

5. a) Convert the following to Decimal and then to octal.

   i)$(125F)_{16}$ ii)$(10111111)_2$ iii)$(4234)_{16}$.

   b) Express the following numbers in decimal: $(101110.0101)_2$, $(46.5)_{16}$, $(26.24)_8$.

6. a) Explain about BCD,Excess-3and Unit distance code(gray code) in detail.

   b) Convert following binary to equivalent GRAY CODE

   i) $(10001011011)_2$ ii)$(111101010111)_2$ iii) $(11101000)_2$ iv) $(1111101000)_2$

   v) $(101010101000)_2$

7. a) Explain about AND,OR,NOT,NAND, NOR and EX-OR gates in detail.

   b) Given 2 binary numbers $X=(1010100)_2$ and $Y= (1000011)_2$.

   Perform 2's complement subtraction for: i)X-Yii)Y-X.