Code No.: **402C1**

MR 14

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)
Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad.

IV B.Tech I Sem Regular End Examinations, NOVEMBER-2017

SUBJECT: **ELECTRICAL DISTRIBUTION SYSTEMS**

(Branch: **EEE**)

Time: **3 Hours** Max Marks: **75 Marks**

PART-A

I. Answer all the questions **5 x1=5M**

1. Define Diversity factor.
2. Mention different standard voltage level of primary distribution system.
3. Write the power loss relation between single phase to 3-phase?
4. Define Circuit breaker.
5. What is the importance of shunt capacitor compensation.

II Answer all the questions **10 x 2=20M**

1. Define coincidence Factor.
2. Briefly explain the importance of load duration curve in distribution networks.
3. Write advantages and disadvantages of a typical ring bus scheme.
4. Define the terms feeder and distributor.
5. Derive the expression for voltage drop in 3-phase balanced system?
6. What are the power losses in AC distribution.
7. Explain operation of fuse.
8. Write Reclosure-circuit breaker coordination.
9. Write short notes on power factor correction.
10. Write the differences between shunt capacitor and synchronous phase modifier.

PART-B

Answer all the questions **5 x 10=50M**

1. Define and derive the relationship between load and loss factors.

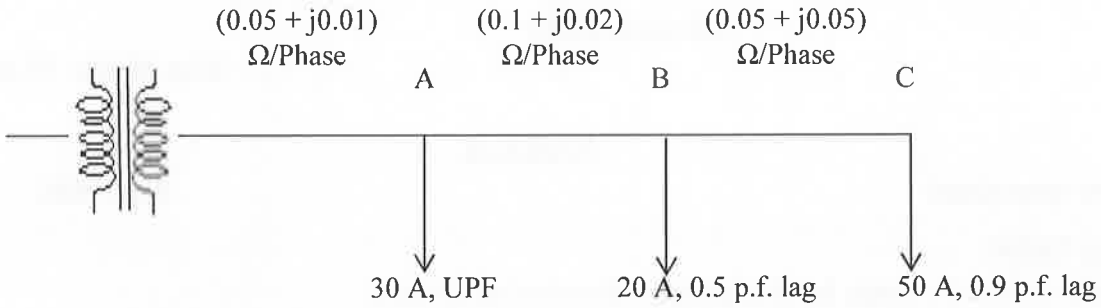
(OR)

2. a) Write the relation between coincidence factor and diversity factor.
   b) The input the distribution substation if 90,600MWh annually. On the peak load day of the year the peak is 30MW and the energy input that day is 300.5 MWh.Find the load factor of the year and for the peak load day
3. How the rating of distribution substation can be calculated. Explain taking a general case with 'n' number of feeders.

(OR)

4. Explain the criteria for location of a substation and what are the benefits obtained through optimal location of substation.

5. A three phase three wire 240 V secondary system with balanced load is shown in figure below. Determine the following:
   a) Calculate the total voltage drop in one phase of the lateral using the approximate method.
   b) Calculate the real power per phase for each load.
   c) The reactive power per phase for each load.
   d) The kilovolt ampere output and load power factor of the distribution transformer.



(OR)

6. Electrical energy is supplied to a consumer from a substation at a distance of 250m. If the power required by the consumer is three phase 100kW at 415v unity pf and resistance of single conductor of the connecting cable is 0.1/1000Ω/m, calculate i) the voltage at the bus bar of the substation ii)the power loss in the cable .

7. What are the types of common faults that occur in a distribution system. Explain them with proper line diagram.

(OR)

8. a) Discuss about the procedure for fault current calculation in case of three phase faults.
   b) Per unit values of positive, negative and zero sequence reactances of a network at fault are 0.08, 0.07 and 0.05 respectively. Determine the fault current if the fault is double line to ground.

9. a) Explain the effect of shunt capacitors
   b) A 400V, 50Hz, three phase line delivers 207 kW at 0.8 p.f lagging. It is desired to bring the line p.f to unity by installing shunt capacitors. Determine the capacitance, if they are (i) Star connected and (ii) Delta connected.

(OR)

10. How an AVR can control the voltage? With the help of suitable diagram explain it's function.

Code No: **402B1**

MR14

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad.

IVB.TECH I SEMESTER REGULAR END EXAMINATIONS, OCTOBER - 2017

SUBJECT: **HIGH VOLTAGE ENGINEERING**

(BRANCH: **EEE**)

Time: **3 Hours** Max Marks: **75 Marks**

PART-A

I. Answer all the questions **5 x1=5M**

1. Give some examples for liquid dielectric.
2. What is a post breakdown phenomenon in gases?
3. What is the limitation of half wave rectifier?
4. Is surge arrester a linear or non linear element?
5. Propose a suitable test for testing of cables.

II Answer all the questions **10 x 2=20M**

1. How electric stress is estimated.
2. What are the applications of insulating materials?
3. What are the different dielectric materials according to their physical nature?
4. Compare elastic and inelastic collision.
5. Draw the circuit of voltage doubler.
6. Define voltage regulation.
7. What is meant by insulation co-ordination?
8. What are the characteristics of switching surges?
9. What are the tests involved in testing transformer?
10. Define creepage distance.

PART-B

Answer all the questions **5 x 10=50M**

1. What are the gases mainly used in insulating medium at high pressures? Which is more suitable? Why?

(OR)

2. Explain Finite Element Method. Also mention the merits and demerits.
3. Explain Electromechanical breakdown and thermal breakdown in solid dielectrics.

(OR)

4. Explain the phenomenon 'treeing and tracking' in solid insulating materials under electrical stress. How does it lead to breakdown?
5. Explain Vande Graff generator with neat diagram.

(OR)

6. Explain the measurement of high dc voltages by series resistance micro ammeter method and resistance potential divider method.
7. Explain about surge arrester with its characteristics.

(OR)

8. Explain about the types of surge arresters. Explain the protection of lines with surge arrester.
9. Explain balance detection method.

(OR)

10. Explain the partial discharge tests on high voltage cables. How is a fault in the insulation located in this test?

Code No.: **404B3**

MR 14

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad.

IV B.Tech I Sem Regular End Examinations, NOVEMBER-2017

SUBJECT: **EMBEDDED SYSTEM DESIGN**

(Branch: **Common to EEE & ECE**)

Time: **3 Hours** Max Marks: **75 Marks**

PART-A

I. Answer all the questions **5 x1=5M**

1. Classify embedded system based on triggering?
2. List various General purpose operating systems
3. Define Oscillator
4. What is a Process?
5. What is Deadlock?

II Answer all the questions **10 x 2=20M**

1. Explain the different classifications of embedded systems?
2. Mention examples of embedded systems
3. What is programmable logic device?
4. What is Masked ROM?
5. Write the steps involved in assembly language programming.
6. What is an ASIC mention any two examples?
7. Define interrupts.
8. Compare the operation of Zigbee and Wi-Fi networks.
9. What is waiting time in task scheduling?
10. What is inter task communication

PART-B

Answer all the questions **5 x 10=50M**

1. Write the history of embedded systems.

OR

2. Discuss operational and non operational quality attributes of embedded system.

3. What are different types of PLDs? Explain the role of PLDs in embedded system design?

OR

4. Explain components of typical embedded system in detail.

OR

5. Give the examples for situations demanding mixing of C with assembly? Explain the techniques for mixing of C with assembly?

OR

6. Explain the different 'Embedded firmware design' approaches in detail.

7. Explain thread context switch and the various activities performed in thread context switching for user level and kernel level threads?

OR

8. What is task scheduling in the operating system context? Explain the different scheduling algorithms in detail.

9. Explain the interlocked functions for locked based mutual under windows OS?

OR

10. Explain the architecture of device driver, with neat sketch

Code No.: **40222 /30222**

MR14 - Regular & MR13 - Supply

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad.

IVB.TECH I SEMESTER REGULAR & SUPPLEMENTARY EXAMINATIONS, NOVEMBER - 2017

SUBJECT: **POWER SYSTEMS OPERATION AND CONTROL**

(BRANCH: **EEE**)

Time: **3 Hours** Max Marks:**75**

PART-A

I. Answer all the questions **5 x1=5M**

1. What is optimum generation allocation?
2. Define optimal flow solution.
3. How the ALFC loop is affected by AVR loop?
4. What is ACE?
5. What is impedance and reactive power?

II Answer all the questions **10 x 2=20M**

1. Write the assumptions involved in deriving loss formula coefficients.
2. What is cost curve and draw its characteristics?
3. Define short range hydro scheduling problem.
4. Define Spinning Reserve.
5. What is load frequency control?
6. Draw the block diagram of a power system showing the governor, turbine and Synchronous generator, indicating their transfer functions.
7. Write the difference between steady state response of load frequency control with Integral Control and without integral control.
8. What are the two area control?
9. Explain about effect of excitation control.
10. What is static excitation system?

PART-B

Answer all the questions **5 x 10=50M**

1. a) Explain about the heat rate curve and cost curve? [5+5]

   b) A power system consists of two 120MW units whose input cost data is represented by the equations

   $C_1=0.004P_1^2+22P_1+800$ Rs/hr

   $C_2=0.004P_2^2+22P_2+1000$ Rs/hr

   If the total received power is 200MW .Determine the load sharing between the units for most economic operation

OR

2. Derive an expression for optimal scheduling loss less transmission. [10]

3. In a two plant operation system, the hydro plant is operated for 8 hrs. during each day and the steam plant is operate all over the day . the characteristics of the steam and hydro plants are:

$C_T = 0.04P_{GT}^2 + 30P_{GT} + 20$ Rs/hr

$W_H = 0.0012P_{GH}^2 + 7.5P_{GH}$ m^3/sec

When both plants are running the power flow from steam plant to load is 190MW and the total quality of water is used for the hydro plant operation during 8hrs is $220 \times 10^6 m^3$? Determine the generation of hydro plant and cost of water used. Neglect the transmission losses. [10]

OR

4. Explain Optimum Hydrothermal system scheduling. [10]

5. Draw a schematic diagram of single area control with economic dispatch control. Write function of local economic dispatch and central economic dispatch control. [10]

OR

6. a) With a schematic diagram of speed governing systems develop linear mathematical model of speed governing systems. [5+5]

b) With first order approximation explain the dynamic response of an isolated area for load frequency control

7. Explain two area frequency control
   a) tie line bias control method.
   b) controlled case. [5+5]

OR

8. Explain the principle, involved in tie line frequency control in case of two area system. [10]

9. What is static compensator? Explain with diagrams the working principle of various types of static compensators? [10]

OR

10. Briefly explain how the reactive power is generated & explain the significance of reactive stability and regulation. [10]

Code No.: **40220/30220**

MR14 –Regular & MR13- Supplementary

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad.

IVB.TECH I SEMESTER REGULAR & SUPPLEMENTARY EXAMINATIONS, OCTOBER - 2017

SUBJECT: **SWITCH GEAR AND PROTECTION**

BRANCH: **EEE**

Time: **3 Hours** Max Marks: **75 Marks**

PART-A

I. Answer all the questions **5 x1M=5M**

1. Define Circuit Breaker.
2. What is difference between fuse and relay?
3. Why protection of transformer is required?
4. What are the advantages of resonant grounding?
5. Define BIL.

II Answer all the questions **10 x 2M=20M**

1. Write the expressions for Restriking voltage and Making capacity of a circuit breaker.
2. What are the types of circuit breakers based on voltage?
3. Explain principle of mho relay.
4. A relay is connected to a 400/5A CT with a current setting of 150%. Calculate the PSM when circuit carries a fault current of 4000A.
5. Define incipient fault and through fault in transformers.
6. Why it is necessary to suppress field immediately after disconnection of faulty alternator from the system?
7. What are the disadvantages of Peterson Coil grounding?
8. What are the factors causing arcing grounds?
9. Draw the Standard Impulse Test Wave.
10. Why lightening accompanied by a thunder?

PART-B

Answer all the questions **5 x 10M=50M**

1. Explain various methods of arc extinction in circuit breaker.

(OR)

2. Explain the terms Recovery voltage, Restriking Voltage and RRRV. Derive an expression for the restriking voltage in terms of system capacitance and inductance.

3. (a) Determine the actual time of operation of a 5A, 3 second over current relay having a current setting of 125% and a TSM of 0.6 connected to supply circuit through a 400/5A CT when the circuit carries a fault current of 4000A. Time of operation is 3.5 seconds or the estimated value of PSM.
   (b) State and explain briefly the requirements and characteristics of protective relaying.

(OR)

4. (a) Describe Instantaneous, DMT and IDMT type Over current Relays with characteristics.
   (b) Explain the principle of operation of Differential and Percentage differential relays.

5. (a) Explain percentage biased differential protection applied to 3-phase transformer with diagram. Also give different types of CT connections used for various combinations of transformer primary and secondary winding connections.

(b) Describe Three-zone distance relay protection of lines using Impedance relays.

(OR)

6. (a) Explain a protection scheme provided against stator internal faults of an Alternator with its diagram.

(b) A star-connected, 3-phase, 10-MVA, 6·6 kV alternator has a per phase reactance of 10% It is protected by Merz-Price circulating-current principle which is set to operate for fault currents not less than 175 A. Calculate the value of earthing resistance to be provided in order to ensure that only 10% of the alternator winding remains unprotected.

7. Explain various methods of Neutral Grounding.

(OR)

8. Discuss and compare Solid, Resistance and Reactance methods of neutral grounding and also draw their circuit and phasor diagrams.

9. Explain Valve type and Zinc-Oxide Lighting Arresters.

(OR)

10. (a) Describe the construction and operation of metal oxide surge arrester with its diagram? [6M]

(b) Explain the causes of overvoltages. [4M]

Code No.: 40221/30221

MR14 –Regular & MR13- Supply

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad.

IV B.TECH I SEMESTER REGULAR & SUPPLEMENTARY EXAMINATIONS, OCTOBER- 2017

SUBJECT: **UTILIZATION OF ELECTRICAL ENERGY**

(BRANCH : **EEE**)

Time: **3 Hours** **Max Marks: 75**

PART-A

I. Answer all questions. **5 x1=5M**

1. Define Load Equalization.
2. Define Radiation
3. What is the normal life of a fluorescent tube?
4. Define plugging,
5. Define dead weight.

II. Answer all questions **10 x 2=20M**

1. Write about armature control speed control of DC shunt motor.
2. Write the advantages of group drives.
3. List the various forms of heat transfer.
4. List the various forms of electric heating.
5. Define Luminous Intensity.
6. Define Mean spherical candle power.
7. List out the various periods of speed time curve.
8. List the different types of electric braking methods?
9. Define coefficient of adhesion.
10. Define specific energy consumption.

PART-B

Answer any 5 questions. **5 x 10=50M**

1. a) Write particular applications of electric drives. **(5M)**
   b) A 220V, 15HP (metric) shunt motor has field and armature resistance of 100ohms and 0.50 ohms respectively. Calculate the resistance to inserted in the armature circuit to reduce the speed to 900rpm to 1050 rpm, if the full load efficiency is 90% and the torque varies as the square of speed. **(5M)**

(OR)

2. Describe the selection of various types of motors for the following services. **(2+2+2+2+2)**

   a) Rolling Mills b) Textile Mills c)Cement Mill d) Paper Mill e)Lift, Cranes

3. a) List the advantages of electric heating. **(5M)**

b) Explain the resistance heating with diagram. **(5M)**

(OR)

4. Write about different types of electric welding..

5. (a) Comparison between tungsten filament lamps and fluorescent tubes. **(5M)**
(b) Discuss the (i) Specular reflection principle (ii) Diffusion principle of street lighting. **(5M)**

(OR)

6. a) State and explain laws of illumination. **(5M)**

b) A lamp having a uniform candle power of 100 in all directions is provided with a reflector which directs 60% of the light uniformly on to a circular area of 10 m diameter. The lamp is hung 5 m above the area. Calculate the illumination at the centre. **(5M)**

7. a) Discuss why a DC series motor is ideally suited for traction services. **(5M)**
b) State the different types of electric braking. Explain each of them in detail. **(5M)**

(OR)

8. (a) How does plugging used for DC series traction motors differ from the plugging as used for dc shunt motors? **(5M)**
(b) Make a comparison of DC and AC traction. **(5M)**

9. a) Define specific energy consumption and discuss the factors which effect the specific energy consumption of trains operating at a given scheduled speed. **(5M)**

b) A suburban electric train has a maximum speed of 60kmph. The scheduled speed including a station stop of 20sec is 40kmph. If the acceleration is 1.5 kmph, determine the value of retardation, if the average distance between stops is 3kms. **(5M)**

(OR)

10. For a quadrilateral speed-time curve of an electric train, derive expression for the distance between stops and speed at the end of the coasting period. **(10M)**

Code No.: **40418**

MR14- Regular & MR13-Supply

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad.

IVB.TECH I SEMESTER REGULAR & SUPPLEMNTARY EXAMINATIONS, NOVEMBER - 2017

SUBJECT: **DIGITAL SIGNAL PROCESSING**

(BRANCH: **EEE**)

Time: **3 Hours** Max Marks: 75

PART-A

I. Answer all the questions **5 x 1 = 5 M**

1. Write mathematical representation for discrete time sinusoidal signal.
2. Write expression of z-transform for $x(n)=a^n u(n)$.
3. What is impulse invariant transformation?
4. State the limitations of Direct form-II Structure.
5. What do you mean by decimation?

II Answer all the questions **10 x 2 = 20 M**

1. Explain about quantization process in DSP System.
2. Define energy and power signals.
3. Calculate the number of complex additions and multiplications in a 256-point radix-2 FFT.-
4. Find the linear convolution of the sequences $x(n)= \{1,3\}$ and $h(n)= \{2,1\}$.
5. Write mathematical expressions for bilinear transformation.
6. Draw the Direct form-I realisation structure of a 3^{rd} order system.
7. Compare FIR & IIR filters.
8. What is Gibbs Phenomenon?
9. Define Dead Band.
10. What is interpolation?

PART-B

Answer all the questions **5 x 10 = 50 M**

1. Determine if the systems described by the below input-output equations are linear or nonlinear.

(a) $y(n)= n\ x(n)$; (b) $y(n)= x^2(n)$

(OR)

2. Find the complete response of the system described by the difference equation $y(n)=5/6y(n-1)-1/6y(n-2)+x(n)-x(n-1)$ when the input signal $x(n)=2^n u(n)$.

   The initial conditions are $y(-1)=1$ and $y(-2)=1$.

3. Compute the four point DFT of the sequence x(n)= {0,1,2,3}

(OR)

4. a. Explain Decimation in Time Radix-2 FFT algorithm [4M]

   b. Find IDFT of the sequence X(k) = {4,1-j2.414,0,1-j0.414,0,1+j0.414,0,1+j2.414} using DIF algorithm [6M]

5. (a) Determine H (Z) using the impulse invariant technique for the analog system function

$$H(S) = \frac{1}{(s+0.5)(s^2+0.5s+2)}$$ [5M]

   (b) Discuss design of IIR Digital Filters from Analog Filters [5M]

(OR)

6. Determine the system function $H(z)$ of the Chebyshev's low pass digital filter with the specifications

   α_p= 1 dB ripple in the pass band $0 \leq \omega \leq 0.2\pi$

   α_s = 15 dB ripple in the stop band $0.3\pi \leq \omega \leq \pi$

   using bilinear transformation (assume T= 1 sec).

7. Determine the lattice coefficients corresponding to the FIR filter with system function

$$H(z) = A_3(z) = 1 + \frac{13}{24}z^{-1} + \frac{5}{8}z^{-2} + \frac{1}{3}z^{-3}$$

(OR)

8. Design a FIR filter with following desired specification using a Hanning window with N=5.

$$Hd(e^{jw}) = \begin{cases} 0 & , \frac{-\pi}{4} \leq w \leq \frac{\pi}{4} \\ e^{-j2w} & , \frac{\pi}{4} \leq w \leq \pi \end{cases}$$

9. Discuss the process of Decimation by a factor D and hence explain how the aliasing effect can be avoided.

(OR)

10. Explain in detail about the poly phase implementation of FIR filter for interpolator and decimator.

Code No: **40424/30424**

MR14 – Regular & MR13-Supply

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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Gundlapochampally (H), Maisammaguda (V), Medchal (M), Medchal-Malkajgiri (Dist), Hyderabad.

IV B.TECH I SEMESTER REGULAR & SUPPLEMENTARY EXAMINATIONS, OCTOBER- 2017

SUBJECT: **VLSI Design**

(BRANCH: **Common to EEE & ECE**)

Time: **3 Hours** Max Marks: **75 Marks**

PART-A

I. Answer all the questions **5 x1=5M**

1. What is the relation between drain to source current I_{ds} & drain to source voltage V_{ds} ?
2. What is meant by contact cut and via.
3. What is Fan-in? give an example.
4. What is the function of parity generator's?
5. Difference between PAL &PLA?

II Answer all the questions **10 x 2=20M**

1. What are the advantages of IC Technology?
2. Define channel length modulation.
3. Discuss the CMOS design style?
4. What is Pass Transistor?
5. Differentiate between gate logic and switch logic.
6. Write the advantages & disadvantages of Pseudo NMOS logic?
7. Draw the architecture of a serial adder ?
8. Give an example based on CMOS ROM ?
9. What is Stuck-at –Fault?
10. What are the types of PLD_S?

PART-B

Answer all the questions **5 x 10=50 Marks**

1. Explain the fabrication process of n-well CMOS technology with neat schematics.

(OR)

2. Explain the process steps for BiCMOS fabrication in an n-well process.
3. Discuss about the scaling of MOS Circuits in detail.

(OR)

4. What is the difference between ' α' and ' β ' scaling factors? Give some examples?
5. Explain about various Switch logic circuits.

(OR)

6. Design a layout diagram for two input NMOS NAND gate?
7. Explain the advantages and disadvantages of NAND ROMs as compared to NOR ROMs.

(OR)

8. How is the Parity generator designed as a linear column of XOR gates with a Tree routing channel and draw the layout of it?
9. Explain about Boundary scan testing.

(OR)

10. Explain the manufacturing Test of a Chip with suitable examples?