Code No.: **50214**

MR15-2015-16 Batch

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(Affiliated to JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD)

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

III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, JUNE-2018

Subject: **Power Electronics**

Branch: **EEE**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer **ALL** questions of the following **5x2Mark=10 Marks**

1. Outline the merits and demerits of IGBT.
2. What is meant by the effect of source inductance?
3. Sketch the DC equivalent circuit of 3-ϕ full converter with the help of average output voltage expression when the source inductance presents.
4. Outline the merits and demerits of TRIAC
5. Describe the functions of Chopper and Inverter.

PART-B

Answer any **FIVE** Questions of the following **5x10 Marks= 50Marks**

1. Explain the two-transistor analogy of SCR and derive the equation for anode current in terms of gate current.
2. a) Explain the operation of single phase, half wave converter for R-load with circuit diagram and waveforms.

   b) A Single-Phase Full Converter is Supplies R-Load. By assuming the constant output current is I_O.Find the following performance factors if the supply voltage is 230V and if the firing angle is $\pi/6$ and R=5Ω (i)Average o/p voltage (E_{dc}) ii)Supply rms current. Iii) Input power factor iv)displacement factor
3. Explain the effect of source inductance on the operation three - phase controlled converter.
4. Explain the operation of step up/down chopper with circuit diagram and waveforms.
5. Derive the expression for steady state maximum and minimum output currents for a step down chopper.
6. a) What is the importance of snubber circuits in respect of Thyristors?

   b) Explain the operation of Single-Phase half-controlled bridge rectifier with R-Load with neat Sketch
7. a) Explain sinusoidal PWM technique used for inverter voltage control. Mention the advantages of this control over multiple pulse width modulation.

   b) Explain the operation of 1-ϕ half wave controlled converter for RL-Load with neat waveforms.
8. **Write a short note on any TWO of the following** **2x5 Marks= 10Marks**

   a) Time Ratio Control b) Cyclo Converter c) Power MOSFET

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

III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Power Transmission Systems**

Branch: **EEE**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. What are the advantages of bundle conductors.
2. What are the units of ABCD (generalized) constants of a transmission line.
3. What is corona effect?
4. Mention the applications of Bewley's lattice diagram.
5. What are different insulation materials used in cables for high voltage and medium voltage?

PART-B

Answer any FIVE Questions of the following **5x10 Marks= 50Marks**

1. a) Derive the expression for capacitance of a 1-ϕ transmission line.
   b) Determine the inductance per km of a 3-ϕ transmission line using 20 mm diameter conductors
2. a) Draw and explain the equivalent circuit and phasor diagram of a nominal-T method.
   b) What is meant by generalized constants of a transmission line? Write their significance.
3. a) Derive the expression for string efficiency of a string of 3- insulators.
   b) A three phase overhead line is being supported by three discs suspension insulators, the potential across the first and second insulators are 12 and 18 kV respectively. Calculate (i) the line voltage, (ii) the ratio of capacitance between pin and earth to self-capacitance of each unit, (iii) the string efficiency.
4. a) What is a travelling wave and explain the development of such a wave along a overhead transmission line.
   b) A surge of 100 kV is incident on a line having a surge impedance of 400 Ω. The line is terminated with a cable having surge impedance of 40 Ω. Determine the transmitted voltage and reflected voltage of the wave.
5. a) Prove that the ratio of internal sheaths diameter to conductor diameter for a single core cable for most economical section is 2.718.
   b) A single core lead sheath cable has a conductor diameter of 1 cm and has insulation of two layers of different materials each 1.5 cm thick. The relative permittivities are 2.5 and 3.5. Calculate potential gradient at the surface of the conductor with a potential difference of 65 KV between conductor and sheath.

6. a) What are ACSR conductors? Explain the merits of ACSR conductors, when used for overhead lines.

b) Define regulation and efficiency of a short transmission line and write its expressions.

7. a) What is corona? Explain the theory of corona formation in detail.

b) Explain different types of system transients and their effects.

8. **Answer any TWO Questions of the following** **5x2Marks= 10Marks**

a) Inter-sheath grading

b) Attenuation and Distortion

c) Bundled conductors

Code No.: **50213**

MR15-2015-16 Batch

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

III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **AC Machines**

Branch: **EEE**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. List the differences between Slip ring and Squirrel cage Induction motor.
2. Enumerate possible reasons if a 3ϕ induction motor fails to start
3. What are the types of single phase induction motors?
4. What are the desired conditions to connect the synchronous generators in parallel?
5. What material is used to make slip-rings and brushes in a synchronous motor?

PART-B

Answer any FIVE Questions of the following **5x10 Marks= 50Marks**

1. a) A 30 HP induction motor has full load efficiency of 84%. The stator and rotor copper losses each equal the stator iron loss at full load. The total mechanical losses are one fifth of the no load loss. Determine the full load slip of the motor.
   b) Derive the Rotor EMF equation of a three phase Induction motor at stand still and running conditions.
2. a) A 3 phase star connected induction motor has 55V across its slip rings on open circuit when normal stator voltage is applied. The rotor is star connected and has impedance (0.7+j5) Ω per phase. Find the rotor current when the machine is
   i) At stand still with the slip rings connected to a star connected starter with a phase impedance of (5+j4) Ω ii) Running normally with 4% slip.
   b) Explain various Power stages of a 3 phase induction motor.
3. Explain in a single phase induction motor why the forward flux wave is several times greater than backward flux wave at normal rotor speed, but are equal at stand still condition.
4. a) Derive the expression for E.M.F. equation of a synchronous generator.
   b) What are the principle advantages of rotating field system type of construction of synchronous machines?
5. a) Explain briefly the methods of starting a synchronous motor.
   b) Derive the expression for power delivered by a synchronous motor in terms of load angle (α).
6. a) What is the effect of slip on rotor losses and explain
   b) Explain the procedure for drawing the circle diagram of a 3phase induction motor.
7. a) Explain the principle of operation of a single phase induction motor.
   b) Compare the method of predetermining the regulation of an alternator by EMF method with MMF method
8. **Write a short note on any TWO of the following** **2x5 Marks= 10Marks**
   a) What is synchronous condenser? Give its applications.
   b) Working Principle of alternator.
   c) No Load and Blocked Rotor Test of induction motors.

Code No.: **50212**

MR15-2015-16 Batch

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III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Power System Analysis**

Branch: **EEE**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. Define graph and co- tree.
2. Write the advantages and disadvantages of load flow analysis using Gauss - Seidal method?
3. Write the disadvantages of load flow analysis using Newton- Raphson method.
4. Mention the reasons for occurrence of faults.
5. Brief transient stability of the power system.

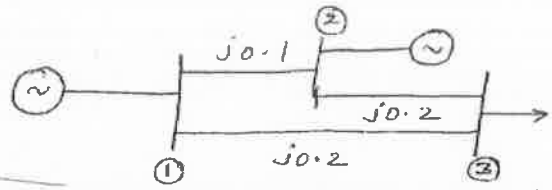
PART-B

Answer any FIVE Questions of the following **5x10 Marks= 50Marks**

1. Form Z_{bus} for the following network with the following data by building algorithm

Bus code	Impedance
1-2	j0.30
1-0	j0.15
2-3	j0.30
2-0	j0.15

2. For the system shown in the figure .use Gauss-siedel method express voltages for bus 2 and bus 3 at the end of first iteration.



3. a)Deduce the load flow equations of Newton Raphson rectangular coordinates.
   b) Write short notes on Sequence impedance
4. a) Write short note on symmetrical components and how it is used to solve unsymmetrical faults in power system.
   b) Explain the importance of per unit system.
5. a) Explain the methods to improve steady state stability.
   b) Write the steps to improve steady state stability.
6. a) Explain the advantages of using the bus admittance matrix in load flow studies
   b) Write short note on DC load flow ?
7. a) Q-limit violation in load flow
   b) Write a short note on unsymmetrical faults.
8. **Answer any TWO Questions of the following** **2x5 Marks= 10Marks**
   a) Write short notes on equal area criteria
   b) Differentiate different methods of load flow study methods
   c) Derive the static flow equations for the load flow analysis

Code No.: **50416**

MR15-2015-16 Batch

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

III B.TECH I SEMESTER SUPPLEMENTARY EXAMINATIONS, MAY-2018

Subject: **Linear & Digital Integrated Circuits Applications**

Branch: **Common to EEE & ECE**

Time: 3 hours **Max. Marks: 60**

PART – A

Answer ALL questions of the following **5x2Mark=10 Marks**

1. State the difference between open loop and closed loop configurations of op-amp.
2. Draw the characteristics of an ideal comparator and that of a commercially available comparator.
3. What are the advantages of Active filters over Passive filters?
4. Discuss the characteristics of three terminal IC regulators.
5. Draw 2- input CMOS AND gate?

PART-B

Answer any FIVE Questions of the following **5x10 Marks= 50Marks**

1. Draw the basic block diagram of a general op-amp and explain the operation of each block
2. a) With the help of a neat circuit diagram, explain the operation of a three op-amp instrumentation amplifier and obtain the expression for its output voltage? 5M
   b) Write a short note on Sample and hold circuit
3. a) Design a wide band pass filter with f_L = 200 Hz, f_H = 1KHz and a pass band gain = 4. Draw the frequency response and calculate 'Q' factor for the filter. 7M
   b) Define capture range, lock in range and pull in time of PLL. 3M
4. a) Draw the schematic block diagram of dual-slope A/D converter and explain its operation. Derive expression for its o/p voltage 'V_0'. What parameters decide its conversion speed and accuracy. 7M
   b) Discuss about the switching regulator. 3M
5. a) Mention the logic levels of CMOS. Design a CMOS inverter and explain its operation.
   b) Verify the truth table of CMOS NOR gate with the help of neat sketch.
6. a) Explain frequency compensation techniques used in Op-Amps.
   b)Explain the RC phase shift oscillator
7. a) Explain the working principle of Astable multivibrator using IC 555 timer.
   b) Write short notes on DAC specifications
8. **Answer any TWO Questions of the following** **2x5 Marks= 10Marks**
   a) Write short notes on Universal shift register(IC74194)
   b) Design a butter worth second order high pass filter
   c) Explain the AC amplifier

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