Code No.: **70205** MR17

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

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

II B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2019

Subject: **DC Machines and Transformers**

Branch: **EEE**

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

PART – A

Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. What is meant by statically and dynamically induced e.m.f.
2. What is Commutation?
3. What is the current drawn by a 220V DC motor if armature resistance is 0.5Ω and Back EMF is 200V?
4. What is polarity test?
5. Explain the concept of inrush current.

PART-B

Answer **ALL** questions of the following **5x10 Marks= 50Marks**

1. a) Describe energy in magnetic systems.
   b).Write a short notes on MMF of distributed windings?

OR

2. Explain the principle of energy conversion of electromechanical system.
3. Describe the constructional view of DC machine with its functions clearly.

OR

4. Draw the O.C.C. of a D.C. shunt generator and determine the critical field resistance.
5. Draw and explains the Brake test on DC machine.

OR

6. Define torque, Write expressions for shaft Torque, Armature Torque.
7. (a) Explain the principle operation of single phase transformer.
   (b) A single phase 150 kVA transformer has efficiency of 96 % at full load, 0.8 pf and at half load with 0.8 pf lagging. Find maximum efficiency of transformer and corresponding load.

OR

8. What is voltage regulation? Derive condition for maximum voltage regulation and also draw regulation curve.
9. (a) Explain the working operation of scott-connection with neat diagram.
   (b) Explain the working operation of star/delta transformer.

OR

10. Compare Auto transformer with two winding transformer in all aspects.

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II B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2019

Subject: **Power Generation and Distribution**

Branch: **EEE**

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

PART – A

Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. What is the function of air preheater in thermal power plant?
2. Explain about surge tank?
3. Write the advantages of GIS.
4. What are the Advantages of Ring main systems
5. Define plant utilization factor and Average load?

PART-B

Answer **ALL** questions of the following **5x10 Marks= 50Marks**

1. Briefly describe the functions of nuclear reactor components.

(OR)

2. Explain in detail about Coal handling plant?
3. a) Explain about pumped storage plants?
   b) Explain mass curve?

(OR)

4. Draw the Layout of Hydel power plant and explain?
5. Explain the constructional aspects of Gas Insulated Substation.

(OR)

6. Draw a layout of indoor substation and explain its operation?
7. Explain the voltage drop calculation of DC distribution system for radial DC distribution fed one end and at the both ends.

(OR)

8. Draw the substation layout showing the locations of all the equipment and explain.
9. Discuss the desirable characteristics of tariff method and explain the features of three-part and power factor tariff methods.

(OR)

10. a) Explain about Load curve and load duration curve.

    b) A 1000MW power station delivers 1000MW for 2 hours, 500MW for 6 hours and it is shut down for rest of each day. It also shut down for maintenance for 60 days annually. Calculate the annual load factor.

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II B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2019

Subject: **Power Transmission Systems**

Branch: **EEE**

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

PART – A

Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. Explain about load factor?
2. Discuss Ferranti effect?
3. What are advantages and disadvantages of corona
4. What are reflected and refracted waves referred to long transmission line?
5. What are methods of grading in cables and represent where each method is preferred

PART-B

Answer ALL Questions of the following **5x10 Marks= 50Marks**

1. **(a)** A domestic lighting installation having fifteen, 60 watt lamps operated as follows:

   5 lamps from 6 p.m. till 8p.m.
   10 lamps from 8 p.m. till 10p.m.
   6 lamps from 10 p.m. till 12p.m.

   Determine the connected load, the maximum demand, the daily load factor and plot the load curve. [7M]

   (b) Also determine the improved load factor if a 2KW immersion heater is used from1p.m. till 5 p.m. and a 2 KW heater from 8 p.m. till 11 p.m. [3M]

OR

2. Discuss about different load modeling and their characteristics?
3. a) Derive the constants for short transmission line with neat circuit and phasor diagram.

   b) A load of three impedances each $(6 + j9)$ is supplied through a line having an impedance of $(1 + j2)$ ohm. The supply voltage is 400 volts 50 Hz. Determine the power input and output when the load is (*i*) star connected and, (*ii*) delta connected.

OR

4. Evaluate the A, B, C, D constants of Medium Transmission line for nominal π Method with relevant diagrams.

5. (a) Define corona and explain the factors affecting corona loss?

   (b) A single phase overhead line has two conductors of dia 1 cm with spacing of 1 meter between centres. If the dielectric strength of air is 21 kV/cm, determine the line Voltage for which corona will commence on the line.

OR

6. a) Explain how the effect of ice and wind can be included in sag calculation of transmission lines

   b) Define sag? Explain how can calculate sag and tension when the supports are at equal level with neat derivation.

7. a) Derive the expression for coefficient of reflection and refraction for current and voltage waves for the line of surge impedance Z terminated through the Resistance R.

   b) Find the values of voltages and currents waves when they have travelled Through a distance of x units over the overhead line?

OR

8. Derive the equation for the velocity of propagation of travelling wave over Overhead transmission line .

9. a) Derive the formula for the capacitance of single core cable

   b) A 3-core cable gives on test a capacitance of 3μf between two cores. Find the line charging current per phase of the cable when connected to 11 KV, 50Hz Bus-bars.

OR

10. A 66kV concentric cable with two inter sheaths has a core diameter 1.8 cm. Di-electric material 3.5 mm thick constitutes the three zones of insulation. Determine the maximum stress in each of the three layers if 20kV is maintained across each of the inner two layers.

Code No.: 70207 | MR17

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II B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2019

Subject: **Electrical Measurements and Instrumentation**

Branch: EEE

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

PART – A

Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. What are the Errors in moving iron Instruments.
2. Explain the process of standardization of potentiometer.
3. What are the main characteristics the transducers?
4. What are the methods to calculate different types of Resistance?
5. Define Electronic Measurement?

PART-B

Answer **ALL** questions of the following **5x10 Marks= 50Marks**

1. a) Derive the balance conditions of Wheatstone's bridge. State its limitations.
   b) Explain the advantages and disadvantages of a PMMC instrument.

OR

2. Explain about Electrostatic Voltmeter?
3. a) Explain the loss of charge method for measuring high resistance.
   b) How Schering Bridge is used for the measurement of unknown capacitor

OR

4. Explain the method to calculate inductance using Maxwell Bridge?
5. a) Explain the constructional features used in potential transformers to reduce the ratio and phase angle errors.
   b) With a neat sketch, describe the construction and working principle of AC polar type potentiometer.

OR

6. Explain CT and derive the expressions for the ratio and phase angle errors Transformer?
7. a) Explain the with neat sketch Successive approximation DVM
   b) Explain with neat diagram of Digital frequency meter

OR

8. a) Explain the working of CRT with a neat sketch.
   b) Explain in detail about wave analyzer and spectrum analyzer
9. a) Explain the working principle of Thermistors.
   b) Describe the principles of operation of capacitive transducers.

OR

10. a) What is a L.V.D.T ? With a neat circuit diagram, explain the principle of operation of a L.V.D.T. Mention its applications.
    b) Write short notes on the concept of Smart Sensors.

Code No.: **70B05** **MR17**

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II B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2019

Subject: **Special Functions and Complex Variable**

Branch: **Common to EEE & ECE**

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

PART – A

Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. Evaluate $\int_0^2 \frac{x^2}{\sqrt{2-x}}dx$ using β and Γ functions.
2. Prove that $J_n(-x) = (-1)^n J_n(x)$.
3. Verify C-R equations for the function $f(z) = e^{-x}(\cos y - i\sin y)$.
4. Evaluate $\int_0^{1+2i} z^2\,dz$
5. State Laurent's Theorem.

PART-B

Answer **ALL** questions of the following **5x10 Marks= 50Marks**

1. (a) Evaluate $\int_0^1 x^{5/2}(1-x^2)^{3/2}\,dx$.

   (b) Show that $\int_0^\infty x^4 e^{-x^2}\,dx = \frac{3\sqrt{\pi}}{8}$

.OR

2. Prove that $\beta(m,n) = \frac{\Gamma(m)\Gamma(n)}{\Gamma(m+n)}$
3. (a) state and prove the orthogonal properties of the Legendre polynomial.
   (b) Show that $P_n(-x) = (-1)^n P_n(x)$.

OR

4. Derive the Rodrigues Formula
5. (a) Find the bilinear transformation that maps points $\infty, i, 0$ into $0, i, \infty$.
   (b)Show that the function $u(x,y) = e^x \cos y$ is harmonic. Determine its harmonic conjugate $v(x,y)$ and the analytic function $f(z) = u + iv$.

OR

6. Show that the function $w = \frac{4}{z}$ transforms the straight line x=c in the z-plane into a circle in the W – plane.
7. a) Evaluate $\int_c \frac{e^{2z}}{(z-1)(z-2)}dz$ where C is $|z| = 4$.

   b) Evaluate $\int_c \frac{dz}{z^8(z+4)}$ when C is $|z| = 2$.

OR

8. Verify Cauchy's integral theorem for $f(z) = z^2$ taken over the boundary of the square with vertices at $-1 \pm i$ and $1 \pm i$
9. State and prove Cauchy's Residue theorem

OR

10. Evaluate $\int_0^{2\pi} \frac{\cos 2\theta\ d\theta}{5+4\cos\theta}$

Code No.: **70408**

MR17

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II B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2019

Subject: **Pulse & Digital Circuits**
Branch: **Common to EEE & ECE**

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

PART – A

Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. How high pass RC circuit used as a differentiator?
2. Explain the basic series clipper circuit below reference voltage?
3. Write the applications of Schmitt trigger?
4. What is meant by sampling gate and give its applications?
5. List the methods of generating a time base waveform.

PART-B

Answer **ALL** questions of the following **5x10 Marks= 50Marks**

1. Why does a resistive attenuator need to be compensated? Explain different methods of Compensation. What is the effect of the output resistance of the generator on an attenuator output?

(OR)

2. Draw and explain the outputs of the low pass RC circuit for different time constant to
   a) Pulse input. b) Step voltage input.
3. Explain the response of the clamping circuit when a square wave input is applied under steady state conditions.?

(OR)

4. a) With the help of a neat circuit diagram, explain the working of a two-level diode clipper.
   b) Draw a circuit, to transmit that part of a sine wave which lies between -3V and +6V.
5. Explain how a compensation circuit improves the linearity of a Bootstrap voltage time base generator?

(OR)

6. a) Derive expression for the UTP and LTP of a Schmitt trigger.
   b) What are the advantages and drawbacks of direct connected binary?
7. a) Design the universal gates using DTL logic and verify the truth tables.
   b) Verify the truth table of RTL AND gate with the circuit diagram of two inputs.

(OR)

8. a) Compare unidirectional and bidirectional sampling gates.
   b) Write the advantages and disadvantages of unidirectional diode gate.
9. a) With the help of a circuit diagram and wave forms, explain frequency division by an astable multivibrator.
   b) How does the sync signal affect the frequency of operation of the sweep generator?

(OR)

10. a) With neat sketch, explain about transistor miller time base generator. **6M**
    b) Write notes on Monostable relaxation circuits. **4M**

210
64
274

Code No.: **70M03** **MR17**

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II B.TECH II SEMESTER REGULAR END EXAMINATIONS, MAY-2019

Subject: **Environmental Science**

Branch: **Common to EEE, ECE, CSE & IT**

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

PART – A

Answer **ALL** questions of the following **5x2Marks=10 Marks**

1. Define eco system and give its classification.
2. Define pollutant? Give two examples?
3. What is sustainable development? Mention any two threats to sustainability?
4. What is ocean thermal energy?
5. Write the reaction involving in the depletion of ozone layer.

PART-B

Answer **ALL** questions of the following **5x10 Marks= 50Marks**

1. Explain different types of ecological pyramids with neat labeled diagrams.

OR

2. a) Analysis the role of food chain & food web contributes the energy flow in the universe.
   b) Explain why pyramid of energy is always upright.
3. Discuss the major environmental impacts of mineral extraction.

OR

4. a) What is meant by biodiversity? Explain various types of biodiversities in an ecosystem.
   b) How can we conserve biodiversity?
5. a) What is water pollution? Discuss various sources of water pollution.
   b) Write about drinking water quality standards.

OR

6. To any industry what are devices to be established to control air pollution at source.
7. What are major implications of enhanced global warming?

OR

8. Discuss the natural formation and occurrence of ozone in the stratosphere.
9. Discuss the following a) crazy consumerism b) role of IT in environment.

OR

10. a) Write a short note on human health.
    b) "Only if we take care of nature , nature will take care of us"