



**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING**  
(AUTONOMOUS)

L.B. Reddy Nagar :: Mylavaram-521 230 :: Krishna Dist. :: A.P  
Approved by AICTE, New Delhi. Affiliated to JNTUK, Kakinada

**M.Tech.(I Semester)(R14) Supplementary Examinations, December 2018/January 2019**  
(R14 : Applicable for 2015, 2016 regular admitted batches only)

A.Y. 2018-19

**TIME TABLE**

**TIME : 10.15 AM TO 1.15 PM**

DATE	Computer Science and Engineering	Software Engineering	Systems and Signal Processing	VLSI and Embedded Systems	Thermal Engineering	Power Electronics and Drives
31-12-2018 Monday	MTCS101 - Advanced Data Structures	MTIT101- Advanced Problem Solving	MTEC101 - Advanced Digital Signal Processing	MTVL101 - VLSI Technology and Design ✓	MTME101 - Mathematical Methods in Engineering	MTEE101- Machine Modeling and Analysis
02-01-2019 Wednesday	MTCS102 - Advanced Database Management Systems	MTIT102 - Software Architecture	MTEC102- Digital Signal Processors	MTVL102 - CPLD and FPGA Architectures and Applications	MTME102- Advanced Thermodynamics ✓	MTEE102- Power Converters ✓
04-01-2019 Friday	MTCS103 - Data Mining	MTIT103- Software Process Management	MTEC103- Linear Algebra for Signal Processing	MTVL103 - Microcontrollers for Embedded System Design	MTME103 - Advanced Heat & Mass Transfer	MTEE103 - Control of Motor Drives-I
07-01-2019 Monday	MTCS104 - Advanced Computer Networks	MTIT104- Object Oriented Software Engineering	MTEC104- Soft Computing Techniques	MTVL104 - Embedded Real Time Operating Systems	MTME104- Advanced IC Engines	MTEE104 - Computational Mathematics
09-01-2019 Wednesday	Elective-I MTCS1054 - Software Project Management	Elective - I MTIT1052- Mobile Computing	Elective-I MTEC1052 - Image and Video Processing	Elective - I MTVL1051 - Wireless Communications & Networks	Elective - I MTME1051 - Advanced Fluid Mechanics	Elective - I MTEE1052 - Reliability Systems Engineering  MTEE1051 - Reactive Power Management
11-01-2019 Friday	Elective-II MTCS1063 - Artificial Intelligence	Elective - II MTIT1063 - Digital Image Processing	Elective-II MTEC1063 - Speech Processing  MTEC1061 - Bio-Medical Signal Processing	Elective - II MTVL1061 - Modern DSP	Elective - II MTME1061 - Advanced Power Plant Engineering	Elective - II MTEE1062 - Modeling and simulation of Power Electronics  MTEE1061 - Industrial Electronics

- NOTE:**(i) Any omissions or clashes in this time table may please be informed to the Controller of Examinations immediately.  
(ii) Even if government / JNTUK declares holiday on any of the above dates, the examinations shall be conducted as notified.  
(iii) For any clarification in respect of the above examinations, please contact the Controller of Examinations.

*slc*  
*Kanbar*  
Date : 18-12-2018

*YVU*  
CONTROLLER OF EXAMINATIONS

*A m r*  
PRINCIPAL

Copy to: 1.M.TECH. Notice Boards, 2. M.TECH. H.O.Ds for N.A.,

2 JAN 2019

H.T.No

R14

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M.Tech. I Semester ~~Regular~~/Supplementary Examinations

**MTEE102-POWER CONVERTERS**

(PED)

*J. m. w. a*

Time : 3 hours

Max. Marks : 60

Answer all the questions  
All questions carry equal marks

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- 1(a) Analyse the single phase full converter to RL load with the help of circuit diagram and waveform. [12M]  
(OR)  
(b) Describe the operation of rectifier in inverting mode briefly with suitable diagrams. [12M]
- 2(a) Illustrate the operation of Six pulse or double star rectifier for RL load with suitable voltage and current waveforms and derive the expression for average load voltage. [12M]  
(OR)  
(b) Describe the operation of three phase half controlled bridge converter for RL load with suitable circuit diagram and wave forms. [12M]
- 3(a) Discuss the working of delta corrected 3-  $\phi$  AC voltage controller with suitable power diagrams for a firing angle 120 degrees assuming R-load. [12M]  
(OR)  
(b) Analyse 1- $\phi$  voltage controller with RL-load with neat circuit and wave forms. [12M]
- 4(a) What is the need for controlling the output at the output terminals of an inverter? Discuss briefly and compare the various methods employed for the control of output voltage of inverters. [12M]  
(OR)  
(b) The single phase half-bridge inverter has a resistive load of  $R=2.4$  ohm and the dc input voltage is  $V_s=48V$ . Determine  
(i) the rms output voltage at the fundamental frequency  $V_{01}$   
(ii) the output power  $P_0$ , (iii) the average and peak currents of each transistor (iv) the peak reverse blocking voltage  $V_{BR}$  (v) the THD, (vi) the DF [12M]
- 5(a) List the different types of multilevel inverters. [6M]  
(b) List the advantages and disadvantages of cascaded multilevel inverter. [6M]  
(OR)  
(c) Draw and explain the circuit diagram of a Single-phase multilevel cascaded H-bridge inverter. [12M]

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M.Tech. (I Semester) Supplementary Examinations

**MTME102-ADVANCED THERMODYNAMICS**

(TE)

Time : 3 hours

Max. Marks : 60

Answer all the questions  
All questions carry equal marks

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- 1(a) Why does free expansion have zero work transfer. [6M]  
(b) Differentiate between Energy and Exergy. [6M]  
(OR)
- (c) The internal energy of a certain substance is given by the following equation  $U=3.56PV+84$ , Where  $U$  is given in kJ and  $P$  in kPa and  $V$  is in  $m^3/kg$ . A system composed of 3 kg of this substance expands from an initial pressure of 500 kPa and volume of 0.22  $m^3/kg$  to a final pressure of 100 kPa in a process in which pressure and volume are related by  $PV^{1.2} = \text{Constant}$ .  
(i) If the expansion is quasi-static, find  $Q$ ,  $\Delta U$  and  $W$  for the process  
(ii) In another process the same system expands according to the same pressure-volume relationship as in part (i) and from the same initial state to the same final state as in part (i), but the heat transfer in this case is 30 kJ. Find the work transfer for this process.  
(iii) Explain the difference in work transfer in parts (i) and (ii) [12M]
- 2(a) Formulate the Maxwell relations and explain its significance. [6M]  
(b) Enunciate the availability equation for non – flow process. [6M]  
(OR)
- (c) A 10 kg mass of water is heated electrically by using an electric heating coil. The temperature of water rises from an initial value of 298 K to 363 K. Determine  
i) First law efficiency of the process  
ii) Second law efficiency of the process [12M]
- 3(a) Comprehend the Mach Number and Mach Angle. [6M]  
(b) Air is accelerated isentropic ally from 100 m/s to 400 m/s in a nozzle. If the temperature at the initial state is 400 K and Mach Number is 1.5, Determine i) Initial Mach Number ii) Final Temperature. [6M]  
(OR)
- (c) Air enters the compressor of a gas turbine at 1 bar, 30°C and leaves the compressor at 4 bar. The compressor has an efficiency of 82%. Calculate per kg of air i) the work of compression ii) the reversible work of compression iii) the Irreversibility. [12M]

**MTME102-ADVANCED THERMODYNAMICS**

- 4(a) A gaseous mixture contains 21% by volume of  $N_2$ , 50% by volume of Hydrogen and 29% by volume of  $CO_2$ . Calculate the molecular weight of mixture, the characteristic gas constant  $R$  for the mixture and the value of reversible adiabatic index. (At  $10^\circ C$  the  $C_p$  values of  $N_2$ , Hydrogen and  $CO_2$  are 1.039, 14.23 and 0.828 kJ/Kg K respectively). [12M]

**(OR)**

- (b) Differentiate between enthalpy of formation and enthalpy of reaction. [6M]
- (c) Methane  $CH_4$  is burned with dry air. The molar analysis of the products on a dry basis is  $CO_2$  : 9.7% ,  $CO$ :0.5%,  $O_2$  :2.95% and  $N_2$ : 86.85%. Determine i) the air –fuel ratio on both a molar and mass basis ii) the percent theoretical air. [6M]
- 5(a) Distinguish the differences between the jet engines and Rockets. [6M]
- (b) What is cogeneration plant? What are the thermodynamic advantages and limitations of such a plant? [6M]

**(OR)**

- (c) Steam enters the turbine of a cogeneration plant at 7 MPa and  $500^\circ C$ . One-fourth of the steam is extracted from the turbine at 600-kPa pressure for process heating. The remaining steam continues to expand to 10 kPa. The extracted steam is then condensed and mixed with feedwater at constant pressure and the mixture is pumped to the boiler pressure of 7 MPa. The mass flow rate of steam through the boiler is 30 kg/s. Disregarding any pressure drops and heat losses in the piping, and assuming the turbine and the pump to be isentropic, determine the net power produced and the utilization factor of the plant. [12M]

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M.Tech. I Semester ~~Regular~~/Supplementary Examinations

**MTVL101-VLSI TECHNOLOGY AND DESIGN**  
(VLSI&ES)

*u.s.g*

Time : 3 hours

Max. Marks : 60

Answer all the questions  
All questions carry equal marks  
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- 1(a) Define threshold voltage of a MOS device and explain body effect. [6M]  
 (b) Illustrate the scaling factors trans conductance  $g_m$ , drain conductance  $g_{ds}$ , figure of merit  $w_o$ . [6M]  
 (OR)  
 (c) Determine the pull-up to pull-down ratio for an NMOS inverter driven by another NMOS inverter. [6M]  
 (d) Discuss the electrical behavior of the MOS transistor with necessary equations of drain currents, [6M]
- 2(a) Describe in detail the Pseudo nmos logic DCVSL with neat diagram. [6M]  
 (b) Explain inductive interconnect delay and resistive interconnect in modern chips. [6M]  
 (OR)  
 (c) Explain how Cascaded inverters drive large capacitive loads. [6M]  
 (d) Explain TG based 2 to1 multiplexer with function table. [6M]
- 3(a) Compare different CMOS combinational circuit families. [6M]  
 (b) Define logical effort of a gate and list out the logical effort of common gates. [6M]  
 (OR)  
 (c) Draw Elmore delay model RC ladder circuit and derive the total delay. [6M]  
 (d) Explain circuit pitfalls that can cause chips to fail. [6M]
- 4(a) Explain three different methods of sequencing blocks of a combinational logic. [6M]  
 (b) What are the various controls in latches and flip flops and explain them? [6M]  
 (OR)  
 (c) What is the function of a synchronizers in sequencing elements and explain a simple synchronizer? [6M]  
 (d) Draw and explain conventional CMOS transparent latches and flip flops. [6M]
- 5(a) Explain power distribution and clock distribution in floor planning. [6M]  
 (b) Explain global and local interconnects in wire planning. [6M]  
 (OR)  
 (c) Briefly explain the PAD frame architectures for off chip connections. [6M]  
 (d) Explain different floor plan tips with diagrams. [6M]