AR13

Code No: 13MTE1002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I M.Tech. I Semester Regular/Supplementary Examinations, February,2016

ADVANCED THERMODYNAMICS

(Thermal Engineering)

Time : 3 Hours **Max Marks: 60**

Answer any FIVE questions

All questions carry equal Marks

1. (a) A system at 450 K receives 225 kJ/s of heat energy from a source at 1500K, and the temperatures of both the system and source remain constant during heat transfer process .Represent the process on T-s diagram and determine: [4M]
   (i) Net change in entropy,
   (ii) Available energy of heat sources and system, and
   (iii) Decrease in available energy.
   Take atmospheric temperature equal to 300 K.
   (b) Derive Maxwell's equations and state their importance in thermodynamics. [8M]

2. (a) Write a short note on Van der Waal's equation. [6M]
   (b) A balloon of spherical shape 6m in diameter is filled with hydrogen gas at a Pressure of 1 bar abs. At a later time, the pressure of gas is 94% of its original pressure at the same temperature: [6M]
   i) What mass of original gas must have escaped if the dimensions of the balloon are not changed?
   ii) Find the amount of heat to be removed to cause the same drop in pressure at constant volume.

3. (a) What is a psychometric chart? What information does it provide? [4M]
   (b) Explain the following process and represent these on psychometric chart; [8M]
   (i) Adiabatic mixing of two streams
   (ii) Heating and humidification
   (iii) Cooling and dehumidification

4. (a) Explain with a neat diagram the working of a Binary vapour cycle. [7M]
   (b) A refrigerator system operating on reversed carnot cycle produces 400 kg/hr of ice at -5C from water at 30C.Make calculation for [5M]
   (i) The power required to drive the machine,
   (ii) The heat rejected from the system.
   Take latent heat of freezing=335kJ/kg and specific heat of ice=2.1 kJ/kgK.

5. (a) What is photo voltaic cell? Explain in detail [6M]
   (b) Explain with a neat diagram the working of a thermoelectric generator. [6M]

6. (a) Discuss about enthalpy formation and enthalpy of combustion. [9M]
   (b) Distinguish between CNG, LNG and LPG. [3M]

7. (a) Discuss about Combined-Gas vapour power cycles. [6M]
   (b) A dual combustion cycle operates with a volumetric compression ratio 12 and with a cut-off ratio 1.615.The maximum pressure is given by $P_{max}=54P_1$ where P_1 is the pressure before compression. Assuming indices of compression and expansion of 1.35. show that the m.e.p of the cycle $P_m=54P_1$.Hence evaluate [6M]
   (i) Temperatures at cardinal points with $T_1=335K$
   (ii) Cycle efficiency

8. (a) What is fuel cell? Describe a hydrogen-oxygen cell [6M]
   (b) Explain with a neat diagram the working of a open cycle MHD system. [6M]

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AR13

Code No: 13MPE1002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. I Semester Regular/Supplementary Examinations, February, 2016

ANALYSIS OF POWER ELECTRONIC CONVERTERS
(Power Electronics and Electric Drives)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions
All questions carry EQUAL marks

1.	a)	Explain the operation of a single phase AC voltage controller when connected with a RL load with neat sketches.	[6M]
	b)	Explain the effect of source inductance on the operation of a single phase AC voltage controller with neat sketches.	[6M]
2.	a)	Analyze the operation of three phase voltage controller when connected with a delta connected R load with neat sketches.	[6M]
	b)	Explain the operation of single phase ac voltage controller with PWM control. Give any three applications of single phase and three phase voltage controllers.	[6M]
3.	a)	Derive the expressions for input power factor and harmonic factor for a single phase fully controlled rectifier when connected with a R load.	[6M]
	b)	Explain about extinction angle control and symmetrical angle control of a single phase ac to dc converter.	[6M]
4.	a)	Explain the operation of a three phase ac to dc half controlled converter when connected to a RL load with neat sketches.	[6M]
	b)	Explain the continuous and discontinuous mode of operation of a three phase ac to dc converter.	[6M]
5.		Explain the operation of a Single-phase single stage boost power factor corrected rectifier with neat sketches.	[12M]
6.		Write short notes on a)Phase displacement Control b) harmonic injection c) delta modulation	[12M]
7.		Explain the Voltage Control of Three-Phase Inverters by means of Space Vector Modulation	[12M]
8.	a)	What are different types of multilevel inverters and explain the operation of Cascaded Multilevel Inverter with neat sketches.	[6M]
	b)	Compare merits and demerits of different types of multilevel inverters.	[6M]

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AR13

Code No: 13MVL1002 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. I Semester Regular/Supplementary Examinations, February,2016

VLSI TECHNOLOGY AND DESIGN

(Common to VLSI System Design and Digital Electronics & Communication Systems)

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

Answer any FIVE questions
All questions carry equal marks

1.	(a)	Explain Lithography, Metallization and diffusion techniques?	[6M]
	(b)	What is latch up condition in CMOS circuits? How it can be eliminated?	[6M]
2.	(a)	Explain about scalable Design rules related to NMOS and CMOS Technologies?	[6M]
	(b)	What are various switch logic circuits? Compare their merits and demerits?	[6M]
3.	(a)	Explain the delay in combinational logic network and how combinational delay can be reduced?	[6M]
	(b)	What are the varieties of design layout of wiring trees in the wires and delay?	[6M]
4.		Explain about 1-φ clocking rules for flip-flops and 2-φ clocking disciplines for Latches?	[12M]
5.	(a)	What are various floor planning methods? Discuss in brief.	[6M]
	(b)	Explain High level synthesis?	[6M]
6.	(a)	Explain chip design methodology with the help of flow chart?	[6M]
	(b)	Explain briefly how the hardware/software Co-simulation and co-synthesis issued are addressed?	[6M]
7.		Write a short note on	
	(a)	Architecture for low power	[6M]
	(b)	Architecture testing	[6M]
8.	(a)	What are the various issues in system-on-chip design? Explain it briefly.	[6M]
	(b)	Develop a sequence of tests for the '01' string recognizer which tests every combinational gate for both stuck -at -0 and stuck -at-1 faults?	[6M]

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AR13

Code No: 13MCS1002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. I Semester Regular/Supplementary Examinations, February, 2016

COMPUTER ORGANIZATION AND ARCHITECTURE
(Computer Science and Engineering)

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

Answer any FIVE questions
All questions carry equal marks

1.	a)	Explain the functional units of a computer.	6M
	b)	Briefly discuss about performance of computer.	6M
2.		Explain in detail about different arithmetic micro operations.	12M
3.		Explain how stack organization take place in CPU.	12M
4.		Explain briefly about floating point numbers, their operations and implementations.	12M
5.	a)	Write about mapping procedures of cache memories.	6M
	b)	Explain about virtual memory in detail.	6M
6.	a)	Briefly discuss about various modes of transfer.	6M
	b)	Explain about input output processor serial communication.	6M
7.		Explain in detail about various array processors.	12M
8.		Write short notes a) Addressing modes. b) Read only memories. c) Asynchronous data transfer	12M

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Code No: 13MSE1002 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. I Semester Regular Examinations, February, 2016

THEORY OF ELASTICITY AND PLASTICITY

(STRUCTURAL ENGINEERING)

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

Answer any FIVE questions
All questions carry equal marks

1. (a) Explain the Stress compatibility equations for plane stress conditions without body forces?

   (b) Derive the compatibility equations for a two dimensional state of Strain?

2. Explain the Saint venants principle and its importance?

3. (a) Write about the applications of generalized solution in Polar coordinates?
   (b) Explain about the Strain components in Polar coordinates?

4. (a) What are the Octahedral shear stresses? Give its importance?
   (b) Derive the compatibility expression for two dimensional problem in polar coordinates?

5. Explain about the torsion of Prismatical bars of non circular section?

6. Explain and derive the equation for Torsion of the Hollow Shaft?

7. Write a short note on:
   (a) Uniqueness of Solution and
   (b) Stress- Strain displacement relations.

8. Write a short note on:
   (a) Generalized Hooke's Law and
   (b) Principle of Superposition.

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