AR13 SET-02

Code No: 13MTE1007

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech., I Semester Regular Examinations, January-2014
SOLAR ENERGY TECHNOLOGY
(Thermal Engineering)

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

Answer any FIVE questions
All questions carry equal marks

1. a) Explain why solar energy is considered as an alternate option and give its potential in context to India.
   b) What is the difference between Pyrheliometer and a Pyranometer? Describe the principle of Angstrom type Pyrheliometer .

2. Calculate the overall loss coefficient for a flat plate collector with two glass covers with the following data. Size of the absorber plate :1.90mx 0.90m, spacing between plate and the first glass cover: 4 cm, spacing between plate and the second glass cover: 4 cm, plate emissivity : 0.92, glass cover emissivity ; 0.88, Collector tilt: 20 °, Mean plate temperature : 70°C, ambient temperature of air :24°C, Wind speed:2.5m/sec, Back insulation thickness: 8 cm., Side insulation thickness: 8 cm Thermal conductivity of insulation :0.05 W/mK.

3. a) Explain the principle of conversion of solar energy into heat
   b) What are the advantages and disadvantages of concentrating collectors over flat plate collectors?

4. a) What is the principle of working of solar pond?
   b) What are the main applications of a solar pond?

5. Enumerate the different main applications of solar energy.

6. a) Explain principles of different types of solar cells
   b) Explain the conversion efficiency and power output of solar cells.

7. a) Explain with a neat diagram, working of a solar refrigeration system
   b) Explain with a neat diagram, working of a solar air heating system.

8. a) What is payback period and how it is calculated.
   b) A solar PV street lighting system consisting of two lamps, three PV modulus, a battery and other associated component costs Rs.55,000/-. The cost of conventional energy saved due to its installation is Rs. 4000/- in the first year and these costs inflates at the rate of 5% per year. Calculate the payback period, with and without discount of the system. Assume discount rate of 9%.

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AR13 **SET-01**

CODE: 13MIT1005

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

I M.Tech I Semester Regular Examinations, January-2014

CODE OPTIMIZATION

(Information Technology)

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

Answer Any Five Questions

All Questions Carry Equal Marks

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1. a)Explain the importance of Code Optimization with an example
   b)Draw and Explain the two high level structures of an optimizing compilers

2. a)With an example explain the issues in designing an intermediate language.
   b)Construct an abstract syntax tree for a C routine

3. Explain the following concepts
   a)Medium level intermediate representations
   b)High level intermediate representations
   c)Low level intermediate representations

4. a)Explain the approaches to control flow analysis
   b)Explain Depth first search and Breadth first search in control flow analysis

5. a)Explain iterative data flow analysis
   b)Explain different flow functions in structural analysis

6. a)What is dependence testing? Explain
   b)Write in brief about dependence in loops

7. a)With an example explain loop simplifications
   b)Explain loop inversions

8. a)Write about procedure integration
   b)What is inline expansion? Explain.

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AR13 SET –01

Code: 13MPE1005

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TEKKALI

(AUTONOMUS)

I M.Tech.I Semester Regular Examinations, January – 2014

MODERN CONTROL THEORY

(Power Electronics and Electric Drives)

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

Answer any FIVE questions

All questions carry Equal marks

1. Explain in detail about the fields, vectors and vector space with examples. [12M]

2 a) Obtain the state variable model in phase variable form for the following system. [6M]

$$\dddot{Y} + 2\ddot{Y} + 3\dot{Y} + 4Y = U(t)$$

b) Derive state transition matrix and write its properties. [6M]

3. Determine whether the system given below is completely controllable and observable.

$$\dot{X} = \begin{bmatrix} -6 & -18 & -6 \\ 2 & 3 & 1 \\ -4 & -8 & -3 \end{bmatrix} X + \begin{bmatrix} 2 \\ -3 \\ 7 \end{bmatrix} U \quad [12M]$$

4. a) What is a Non-linear system. Describe the common physical non-linearities [6M]
b) Derive the describing function of Dead-zone and saturation Non linearity [6M]

5. Construct phase trajectory for the system described by the equation

$$\frac{dx_2}{dx_1} = \frac{4x_1 + 3x_2}{x_1 + x_2}$$

Comment on the stability of the system [12M]

6. a) State and explain the Lyapunov's stability theorem. [6M]
b) Determine the stability of the system described by the following equation using Lyapunov's direct method. [6M]

$$\dot{X} = AX \qquad A = \begin{bmatrix} -1 & -2 \\ 1 & -4 \end{bmatrix}$$

7. a) Derive the Euler equation for the fixed end point by using calculus of variation [6M]
b) Determine the smooth curve of smallest length connecting the point $x(0) = 1$ to the line

$t = 5$ t_f is fixed and x_f is free. [6M]

8. a) Explain steps required for the solution of optimal control problem. [6M]
b) Explain state regulator problem in optimal control theory. [6M]

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AR13 SET-01

13MVL1006

ADITA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech I Semester Regular Examinations, January- 2014
Embedded and Real Time Systems
(Common to VLSI System Design & DECS)

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

Answer any FIVE questions
All questions carry EQUAL marks

1. a) Explain the differences between microprocessor and microcontroller.
   b) Explain various components of an Embedded System with suitable diagram.

2. a) List the various computational models in Embedded Design.
   b) Explain state machine model with suitable example.

3. a) What is a Kernel? What are the different functions handled by the general purpose Kernel.
   b) Explain Mail boxes, Message queues, pipes, signals with the help of suitable examples.

4. Explain the following communication interfaces elaborately
   a) RS232 (b) IEEE 802.11 (c) Blue tooth

5. a) What are the time management functions in RTO's?
   b) What is priority inversion problem? How it can be eliminated explain.

6. a) What is hardware-software co-design? Explain fundamental issues in Hardware/software co-design.
   b) Explain about reuse of Intellectual property codes.

7. a) What is the difference between Semaphore and Mutex
   b) Write about tasks and task schedule related toRTOS.

8. Explain different debugging techniques of RTOS in detailed.

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AR13 SET-02

Code No: 13MCS1005

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TEKKALI

(AUTONOMUS)

I M.Tech.I Semester Regular Examinations, January – 2014

Operating Systems

(Computer Science and Engineering)

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

Answer any FIVE questions
All questions carry equal marks

1	a) Write about Simple Batch processing	[7 M]
	b) Write about Parallel systems	[5 M]
2	a) Briefly write about file handling utilities	[6 M]
	b) Write about tar, du,cmp commands with suitable examples	[2+2+2 M]
3	a) Write about shell responsibilities	[6 M]
	b) Write about mkdir , rmdir commands with suitable examples?	[3+3 M]
4	a) Write about achieving Interprocess communication by shared memory	[6 M]
	b) Write about preemptive Shortest Job First scheduling algorithm with an example.	[6 M]
5	a) Write about contiguous memory allocation	[6 M]
	b) Write about allocation of frames	[6 M]
6	a) Write about implementation of Monitor using Semaphores	[6 M]
	b) Write about alarm , abort system calls	[3+3M]
7	a) Write about Tree,Acyclic-Graph and General Graph directory structures	[3+3+3 M]
	b) Write about allocation methods of disk space to files	[6 M]
8	a) What is a message queue? Write code to create private message queue	[6 M]
	b) Write about file locking	[6 M]

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