

☆ CAT-2 (/CAT-2)

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Dear Students,

Find information below for CAT-2. If you have any questions, feel free to ask using the discussion button or you can also approach me in person and clarify any questions you have.

Regards,
Balaji.

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• CAT-2 Slides

- For CAT-2 exam you need to read the book to start with. Nevertheless, for the sake of completion, I have included here some class notes and slides (https://drive.google.com/open?id=0B-2dPTXnV_COd2lyZDd2dnIqUVU) which you may find it useful.

• CAT-2 Syllabus

- For CAT-2, we have units 2, 3 from the syllabus (/syllabus). All topics included under Unit 2, 3 in the official syllabus (/official+syllabus) are included for CAT-2
- The page numbers in the Wayne Wolf book will be updated in this page routinely. If there are additional material to be included as the part of the main reading, the details of those additional material also will be noted down here routinely.

▪ Unit 2

- (Chapter 5, Subsections 5.2, 5.3, 5.4 and 5.5) (Additional Class Notes)
- Representation of program: Control and Data Flow: Chapter 5, Subsection 5.2, Pages 215-220, Title: Models of Program.
- The program translation process: assembly, compiling, and linking: Chapter 5, Subsection 5.3, Pages 220-227, Title: Assembly, Linking, and Loading.
- Fundamental concepts of assembly language and linking labels, address management: (covered in the above pages, that is, 220 to 227).
- Compilation tasks: mapping variables to memory, managing data structures, translating control structures, and translating expressions: Chapter 5, Subsection 5.4 and 5.5, Pages 227-239, Title: Basic Compilation Techniques and Program Optimization.
- Embedded Software Tools. **Not Included for CAT-2**

▪ Unit 3

- (Chapter 6: Subsections 6.2, 6.3, 6.4, 6.6; Chapter 3: Subsections 3.6; An Published Paper)
- Real Time Operating Systems (Pages 308-315) (Pages 316-329)
 - Context Switching Mechanisms
 - Scheduling Policies
 - Rate Monotonic Scheduling: theory and practice
 - Priority Inversion
 - EDF
 - Video Lecture for Scheduling Policies

(<http://savefrom.net/?url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv=oHMC2aO8GII>)

<https://www.youtube.com/watch?v=oHMC2aO8GII> chrome&utm_medium=extensions&utm_campaign=lii

- Link 1 (<https://www.youtube.com/watch?v=oHMC2aO8GII>)
- Link 2 (<https://www.youtube.com/watch?v=oHMC2aO8GII>)

- Message passing versus shared memory communication
- Interprocess communication styles such as Semaphores, Message Passing, Mailbox, and RPC

(<http://savefrom.net/?url=https%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv=lcRqHwln5Dk>)

<https://www.youtube.com/watch?v=lcRqHwln5Dk> chrome&utm_medium=extensions&utm_campaign=lii

- Video Lecture Link 1 (<https://www.youtube.com/watch?v=lcRqHwln5Dk>)
- Video Lecture Link 2 (<https://www.youtube.com/watch?v=lcRqHwln5Dk>)

- Low Power Computing (Pages 333 to 336)(Pages 129 to 134)(Pages from Published paper)

(http://savefrom.net/?

url=https%3A%2F%2Fwww.youtube.com%2F

- Video Lecture Link (<https://www.youtube.com/watch?v=ncCSHcLWrYM>) chrome&utm_medium=extensions&utm_cam
- Sources of energy consumption: toggling, leaking
- Instruction level Power management
- Function unit management
- Memory system power consumption: Caches, off-chip memory
- Power consumption with multiple process
- System-Level Power management: Deterministic and Probabilistic Methods
 - L. Benini, A. Bogliolo, and G. De Micheli, "A survey of design techniques for systemlevel dynamic power management,"IEEE Transactions on VLSI Systems 8(3) (2000): 299–316.
(<http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=845896>)

• CAT-2 Difficulty

- Let us first rate the level of difficulty of CAT-1 from 0 to 10 (where 0 is the easiest question paper that I can set and 10 is the most difficult question paper that I can set). I rate the difficulty of CAT-1 as 2. The level of difficulty of CAT-2 is expected to be 8-4.

• How to prepare for CAT-2?

- *Step 1:* Read on a daily basis the recommended chapters starting from today until CAT-2.
- *Step 2:* Complete the three quizzes on a weekly basis starting from this week until the week before CAT-2.
- *Step-3:* Do further reading on a bi-weekly basis on the reference material posted (/Reference+Text+Books) in the reference books page.
- *Step-4:* Prepare for Practice CAT-2 (<https://balaji-esd.wikispaces.com/event/view/3362048>) as you would prepare for the actual CAT-2; Show up for the exam; Note down the difficulties you are facing; Discuss with your friends and faculty how to handle the difficulty.
- *Step-5:* A week before CAT-2 and on the day before CAT-2 do multiple revisions, redo the quizzes, revise further readings, solve practice CAT-2.
- *Step-6:* Have a good sleep (7 or 8 hours) on the night before CAT-2 and enjoy your exam.

• CAT-2 Format

- There are two parts. Part A with four five mark questions. Part B with three ten mark questions.
- That is, Part A ($4 * 5 = 20$); Part B ($3 * 10 = 30$)
- You have to **answer all** questions.
- All questions are problems. There are **no descriptive** answer questions.

• Predict Your CAT-2 Score

Effort Label	Effort Description
A	Read thoroughly Wayne Wolf Book <i>(pages as recommended in the CAT-2 Wikispace)</i>
B	Workout the examples problems in the text book
C	Workout the exercise problems in the text book
D	Do the online quizzes
E	Workout the practice CAT-2 question papers for both the batches
F	Revise all that you did for efforts A, B, C, D, and E
G	A quick look at the Reference Reading <i>(as mentioned in Wikispace for Unit 2&3)</i>

Efforts Completed	Predicted CAT-2 Score (out of 50)
A	0 to 5
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- **Practice CAT-2 Question Papers**

```

START MOV R7,#4FH ; R7 has total items count
      MOV R0,#51H ; storage location of second term
; Sum first two terms of the series. This is done by following three instructions.
      MOV @R0,#01H ; use second term
      DEC R0 ; location for first term
      MOV @R0,#00H ; use first term
; Initialize the storage pointer (R1) and adjust the counter (R7) for two terms, already stored.
      MOV R1,#2FH ; R1 pointing location for third term
      MOV R7,#2 ; use two terms by 2
      DEC R7 ; two terms already generated
; Now, R0 pointing to the first of the two generated terms and R1 pointing to the storage area of the
; third term, which is yet to be generated.
; Iteration for generating and storing term start from here.
MAIN MOV A,@R0 ; get first term in register A
      INC R0 ; point to next term
      ADD A,@R0 ; add first term to get the next one
      MOV @R1,A ; store new term
      INC R1 ; location for next new term, if any
      DJNZ R7,MAIN ; generate all N terms
; R7 indicate all N terms that are generated and stored. Terminate the program.
      OVER SMP OVER ; terminate here

```

- For the assembly program given in Question 2, construct the control flow graph.
- Prove that for Rate Monotonic scheduling the processor utilization is below 100%

5. Construct the ge program. Show the
traversal of the data flow graph for at least one arithmetic operation and generate the

- **Unit 2 Quiz**

Unit 2 Easiest Quiz

This quiz tests you the basics of data flow graphs and control flow graphs.

NEXT

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