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10CS62

Sixth Semester B.E. Degree Examination, Jan./Feb. 2021
UNIX System Programming

Time: 3 hrs. Max. Marks:100

Note: *Answer any FIVE full questions, selecting at least TWO questions from each part.*

PART – A

1 a. What are the major difference between ANSI 'C' and K and R 'C'? Explain with an example. (08 Marks)

b. What do you understand by the term feature test macros? List all the five features test macro along with their meanings. (06 Marks)

c. What are the API common characteristics? List any five values of the global variable errno along with their meanings whenever API fails. (06 Marks)

2 a. What are the different types of files available in UNIX or POSIX system? Explain with an example. (08 Marks)

b. What is the necessary of indoes in UNIX system V? (05 Marks)

c. Define how UNIX Kernal that supports for files and explain them. (07 Marks)

3 a. Explain the following API's with prototypes.
i) open ii) fseek iii) chown iv) access. (08 Marks)

b. Explain how fcntl API is used in file and record locking. (06 Marks)

c. Explain C++ fstream class can be used to define objects that represent file system. (06 Marks)

4 a. Explain the memory layout of C program with a neat diagram. (06 Marks)

b. With an example program, explain the use of setjmp and longjmp functions. (08 Marks)

c. Describe the UNIX Kernal support for a process. Show the related data structure. (06 Marks)

PART - B

5 a. What is the difference between fork and vfork function? Explain with an example C/C++ program each. (08 Marks)

b. What is race condition? Write a program in C/C++ to illustrate a race condition. (06 Marks)

c. How UNIX operating system keeps process accounting? (06 Marks)

6 a. What is signals? Discuss any five POSIX defined signals. Explain how to setup a signal handler. (10 Marks)

b. What is daemon? Briefly explain the coding rules. (10 Marks)

7 a. What is FIFO? Explain how it is used in IPC. Discuss with an example the client – server communication using FIFO's. (10 Marks)

b. What are the different system calls available to create and manipulate semaphores? Explain them. (10 Marks)

8 Write short notes on the following :

a. Shared memory

b. Stream pipes

c. Client–server connection function

d. Network login. (20 Marks)

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10CS63

Sixth Semester B.E. Degree Examination, Jan./Feb. 2021
Compiler Design

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. List the phases of a Compiler. Describe the a analysis part and synthesis part of the compiler. **(05 Marks)**

b. Write a note on Compiler Construction tools. **(05 Marks)**

c. Draw the transition diagram for relation operators in C : < , > , < = , > = , = = , ! =. **(05 Marks)**

d. Explain the concept of Input buffering scheme. **(05 Marks)**

2 a. Enlist the error recovery strategies in parser and briefly explain any three recovery strategies in parser. **(06 Marks)**

b. Construct FIRST and FOLLOW set for the following grammar :

$D \rightarrow T$ id ; $D \mid \in$

$T \rightarrow BC \mid$ Struct id {D}

$B \rightarrow$ int | float | char

$C \rightarrow$ [num] $C \mid \in$. **(06 Marks)**

c. Write down the algorithm for construction of predictive parsing table and also construction the parsing table for the given grammar.

$E \rightarrow T\ E'$ $E' \rightarrow +\ T\ E' \mid \in$ $T \rightarrow$ id|(E). **(08 Marks)**

3 a. Construct LR(0) automaton using CLOSURE and GOTO functions for the grammar given below. Check whether the grammar is in SLR. Justify your answer.

$S \rightarrow L = R \mid R$

$S \rightarrow * R \mid$ id

$R \rightarrow L$. **(08 Marks)**

b. Figure out different types of conflicts occur during shift reduce parsing. Discuss the situations in which these conflicts occur. **(04 Marks)**

c. Write down the algorithms for constructing SLR parsing table and LR parsing for the given input. **(08 Marks)**

4 a. What are the limitations of SLR parser? How do you overcome these limitations? Write down the method to calculate look ahead token for canonical items. **(06 Marks)**

b. Construct the canonical LR(1) items and the GOTO graph as well as canonical LR(1) parsing table for the following grammar $S \rightarrow (S)\ S \mid \in$. **(10 Marks)**

c. Build LALR automaton or parsing table for the grammar given in Q4(b). **(04 Marks)**

PART – B

5 a. Explain the concept of Syntax directed definition and translation. Define synthesized and inherited attributes. Mention the types of attributes used in bottom up and top down parsers. **(08 Marks)**

b. Write down the Syntax directed definition for simple calculator. Construct annotated parse tree and the Syntax tree for the input string 5 * 6 + 2 * 7. **(06 Marks)**

c. Give semantic rules for declaration of data types and Syntax directed translation for the same using the given grammar.
$T \rightarrow B\ C \quad B \rightarrow int \mid float$
$C \rightarrow [num]\ C \mid \in$. **(06 Marks)**

6 a. Demonstrate the concept of three address code, quadruples. Translate the arithmetic expression f = a – (b + c) * d into i) Quadruples ii) Triples iii) Indirect triples. **(08 Marks)**

b. Describe the Syntax directed translation for switch statement. **(08 Marks)**

c. Justify the role of control statements in programming language. Write down the Syntax directed definition for flow of control statements. **(04 Marks)**

7 a. Describe the structure of activation record with neat diagram. **(05 Marks)**

b. List out the functions and properties of memory manager, a subsystem of heap management. **(05 Marks)**

c. Mention the steps involved in calling a function and returning from a function with the diagram. **(05 Marks)**

d. Using the below given code for finding n^{th} Fibonacci number, build activation tree for finding 5^{th} Fibonacci number.

```
int fib (int n)
        {if (n < 2) return 1;
         else return (fib (n-1) + fib (n-2));}.
```
(05 Marks)

8 a. For the following program

```
For I = 1 to 10 do
For J = 1 to 10 do
        A[I, J] = 0
    For I = 1 to 10 do
        A = [I, I] = 1.
```
(10 Marks)

b. Explain the concept of dead code elimination and finding local common sub expressions with examples. **(10 Marks)**

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10CS65

Sixth Semester B.E. Degree Examination, Jan./Feb. 2021
Computers Graphics and Visualization

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO full questions from each part.***

PART – A

1 a. What is Computer Graphics? List and explain the applications of the same. (06 Marks)
b. Discuss the physical Imaging Systems and show the process of Image formation with pinhole camera. (06 Marks)
c. With a neat sketch, discuss the major steps in Graphics Pipeline Architecture. (08 Marks)

2 a. List and explain the major groups of OpenGL API functions along with an example for each. (07 Marks)
b. Discuss the subtractive and Additive color models. (05 Marks)
c. What is Sierpinski Gasket? Write an OpenGL program for 3D gasket. (08 Marks)

3 a. Discuss the logical classification of input devices with their interaction types. (06 Marks)
b. What are input modes? Explain the event driven input for keyboard and window events. (06 Marks)
c. With a neat sketch, explain the display processor architecture along with the display lists creation and execution. (08 Marks)

4 a. What are scalar, points and vectors? Explain the procedure for converting a world object frame into camera or eye frame. (10 Marks)
b. What do you mean by affine Transformation? Discuss the basic 2D transformations such as Rotation, Scaling and Translation along with their matrix representations. (10 Marks)

PART – B

5 a. Why do we require homogeneous coordinate system? Derive the composite transformation matrix for rotation about a fixed point (x_f, y_f) by an angle θ. (06 Marks)
b. Explain the 3D rotations with their representations in matrix form. Show how rotation about an arbitrary axis is done. (06 Marks)
c. How OpenGL does support transformations. Write an OpenGL program to rotate a cube about x and y axes. Use mouse buttons to select the axis of rotation. (08 Marks)

6 a. With a neat diagram, explain the different types of views that are employed in computer graphics systems. (10 Marks)
b. Derive the equations for perspective and parallel projections. Represent the same in matrix form. (10 Marks)

7 a. What are light sources? Explain the phong lighting model. (08 Marks)
b. Explain any two methods for shading polygons. (06 Marks)
c. How is sphere approximated? Explain. (06 Marks)

8 a. Explain the Cohen-Sutherland line clipping algorithm with a neat pseudo code. (10 Marks)
b. Digitize the line from (5, 8) to (10, 10) using the DDA algorithm. (05 Marks)
c. Write a note on Z-buffer algorithm for hidden surface removal. (05 Marks)

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