1789   *Your Roll No. ....*

B.Sc. (Hons.) / III Sem./Computer Sc.   A
Paper 302 – SYSTEM SOFTWARES
(Admissions of 2001 and onwards)

Time : 3 Hours   *Maximum Marks : 75*

(Write your Roll No. on the top immediately
on receipt of this question paper.)

*Attempt **all** questions.*
Parts of question should be answered together.

Section I
(27 marks)

1. (a) State the purpose of each of the following commands :

    (i) <u>file.</u>

    (ii) <u>wait.</u>

    (iii) <u>du.</u>   3

    (b) Write the use of any **one** of the following commands :

    (i) <u>sed '//s/^/ →/$ *</u>

    (ii) <u>"% get –e s.lang"</u>   2.

(c) Assume that a file test.txt is available in the current directory and has the following contents :

great fleas have little fleas

upon meir backs to bite 'em

And little fleas have lesses fleas,

and so ad infinitum.

Give a command to list lines that

(i) have the word 'fleas' in them

(ii) do not have the word 'fleas' in them. 2

2. Write a shell script to modify cal command to accept the following input 3

$ cal jan mar nov

Or

Write an awk program to print input in backward line order. For example the following input file

hello

world

simple

living

on execution of the program would be transformed to follows

living

simple

world

hello 3

3. (a) What is the use of <u>no hup</u> command ? Illustrate with the help of an example.   2

   (b) Assuming that a file's current permissions are rw_r_x_r_ _, specify the chmod expression required to change menu to :

   (i) rwx rwx rwx

   (ii) r_ _ r _ _ _ _ _

   using both relative and absolute methods of assigning permissions.   2+2

4. (a) Write a sed script which inserts a blank line after each line of text of the input file.   2

   (b) Write a shell script to take a file name on its command line, and edit it using sed so that every line that begins with the string server, for example,

   <u>Server other text.</u>

   is edited so that anything after "server" (i.e. "other text") is replaced with the string "clock.tyict.vtc.edu.hk". so that the above line looks like this :

   <u>server clock.tyict.vtc.edu.hk</u>   5

   (c) Write a code using a wk to print only the odd numbered lines of a file.   4

Section II

5. With the help of a diagram, describe how loading and calling of a subroutine is done in Dynamic linking. 5

Or

State and explain the Pass I algorithm of an assembler for the hypothetical machine SIC. 5

6. (a) Write SIC– assembly language instructions to do the following :

   (i) Assign storage area to BETA and ALPHA.

   (ii) Set ALPHA. (Storage area) to

   $4 \star BETA + 9.$ 2

   (b) Describe the general format of lex program. 3

Or

Write a YACC program to evaluate an expression formed by the grammar as follows : 3

$E \rightarrow E + E$

$E \rightarrow E - E$

$E \rightarrow .DIGIT$

Assume that appropriate tokens are returned by lex program.

(c) Give the format of Text Record. 2

7. (a) "M00.000705" is an example of modification record. Describe its parts. 2

(b) Assume a hypothetical computer with the given instruction format and op code (operation code) table. Write the object code for the given assembly code of the computer.

opcode	n i x b p e	address
8	6	18

|— bits — | ———— bits ———— | ——— bits——— |

Addressing mode

n	i	x	b	p	e	Addressing Mode
0	0	0	1	0	0	Base Relative
0	0	0	0	1	0	PC Relative
0	0	1	0	0	0	Indexed
0	1	0	0	0	0	Immediate
1	0	0	0	0	0	Indirect
1	1	0	0	0	0	Direct

STRCPY	START	1000
FIRST	LDX	ZERO
MOVE CH	LDCH	STR1,X
	STCH.	STR2, X
	TIX	ELEVEN

	JLT.	MOVECH
STRI.	BYTE.	C' TEST STRING'
STR2	RES B	11
ZERO.	WORD	0.
ELEVEN	WORD	11.
	END	FIRST.

Opcode Table

Symbol	Code (6 bits)
LDX m.	00000100
LDCH.m	01010000
TIX m.	00101100
JLT m.	00111000
STCH.m	01010100

7

(c) State the functions of loaders and linkers. 3

Section III

8. Write a script that breaks a user entered text into words and prints menu on different lines in a text area. 6

9. (a) Write the output of the following perl script.

$ search= "Now is the time",

print ("Test string is : '$ search'\n\n");

if ($ search = ~ /New/) {

print ("string 'Now' was found/n"). 3

}

If ($ search = ~ / \b(\w + ow\b/x) {

print ("word found ending in 'OW' : $|\n");

}

(b) The following DTD gives. Structure of an XML document relating to a book :

```
<! ELEMENT book (title, (author+/
editor+), publisher, price)>
< ! ATTLIST book year
CDATA#REQUIRED>
< ! ELEMENT author (last, first)>
< ! ELEMENT editor(last, first,
affiliation)>
< ! ELEMENT title (#PCDATA)>
< ! ELEMENT last (#PCDATA)>
< ! ELEMENT first (#PCDATA)>
< ! ELEMENT affiliation
(#PCDATA)>
< ! ELEMENT publisher (#PCDATA)>
< ! ELEMENT price (#PCDATA)>
```

Write a valid XML document corresponding to the above DTD. 5

10. (a) What is the purpose of XML Name space ? Describe using an example. 3

(b) What is the significance of the following metacharacters in Perl - 2

(i) $

(ii) \d.

(c) Write the syntax and use of the following Java Script functions in

(i) indexof( )

(ii) split ( ) in string object 4

(d) What is the format and use of 'scalar' datatype in Perl ? 1