IS631

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INSTITUTE OF TECHNOLOGY

(Autonomous Institute, Affiliated to VTU)
Bangalore – 560 054

SEMESTER END EXAMINATIONS – MAY/JUNE 2017

Course & Branch	:	B.E : Information Science and Engineering	Semester	:	VI
Subject	:	System Software	Max. Marks	:	100
Subject Code	:	IS631	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1. a) Illustrate with an example the instruction formats and data formats of SIC /XE Machine. CO1 (06)

b) Generate the Object code for SIC machine CO1 (07)

```
WRREC   START   105D
        LDA     LENGTH
WLOOP   TD      OUTPUT
        JEQ     WLOOP
        LDCH    BUFFER, X
        WD      OUTPUT
        JLT     WLOOP
        RSUB
OUTPUT  BYTE    X '05'
BUFFER  RESB    400
LENGTH  RESB    2
        END     WRREC
```

Instruction	opcode
LDA	00
TD	E0
JEQ	30
LDCH	50
WD	3C
JLT	38
RSUB	4C

c) i) Write a SIC/XE program to read value of X and Y from memory and evaluate the expression Z=X*4+ Y*3 CO1 (07)

ii) Explain the use of SVC and TD instruction in SIC/XE?

2. a) Develop an assembly language program in SIC/XE machine to add the contents of 2 arrays, **IntArr1** and **IntArr2**, and store the added result in **ResArr**. CO1 (06)

b) Generate the Object code for SIC machine. CO1 (07)

SUM	START	4000
FIRST	LDX	ZERO
	LDA	ZERO
	LDCH	CHARZ
LOOP	ADD	TABLE,X
	TIX	COUNT
	JLT	LOOP
	STA	TOTAL
	RSUB	
CHARZ	BYTE	C'ABC'
TABLE	RESW	2000
COUNT	RESW	1
ZERO	WORD	0
TOTAL	RESW	1
	END	

Instruction	Opcode
LDX	04
LDA	00
LDCH	50
ADD	18
TIX	2C
JLT	38
STA	0C
RSUB	4C

c) What are assembler directives? Describe any five assembler directives used in SIC/XE instructions. CO1 (07)

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UNIT - II

3. a) Generate the object code for each statement in the following program: Opcodes:LDX-04;LDA-00;LDB-68;ADD-18;TIX-2C;JLT-38;STA-0C;RSUB-4C CO2 (08)

```
SUM     START   0
FIRST   LDX     #0
        LDA     #0
        +LDB    #TABLE2
        BASE    TABLE2
LOOP    ADD     TABLE, X
        ADD     TABLE2,X
        TIX     COUNT
        JLT     LOOP
        +STA    TOTAL
        RSUB
COUNT   RESW    1
TABLE   RESW    2000
TABLE2  RESB    2000
TOTAL   RESW    1
        END     SUM
```

b) Provide the format of the modification record. With suitable illustrations indicate why modification records are generated only for Format 4 instructions. CO2 (04)

c) Describe the working of Load and go assembler. CO2 (08)

4. a) Generate the symbol table and the object code(each statement) for the following assembly language program- CO2 (08)

OPcodes:
CLEAR: B4, STL: 14, LDB: 68, JSUB: 48, LDA: 00, STA: 0C, J: 3C

```
SUM     START   0
FIRST   CLEAR   S
        LDB     #5
        +JSUB   RESULT
        STA     LOC,X
        J       @NUM
NUM     RESW    1
TEMP    WORD    20
LOC     BYTE    X'12'
RESULT  RESB    2
        END     SUM
```

b) Referring to the following program that uses control section (CSECT) assembler directive, provide different records of object code and program for subroutine 'COPY'. Given STL-14, CLEAR-B4,JSUB-48. CO2 (08)

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```
Location   Source Statement                                  Object Code
0000       COPY    START    0
                   EXTDEF   BUFFER, BUFEND
                   EXTREF   RDREC
0000       FIRST   STL      RETADR
0003       CLOOP   +JSUB    RDREC
.                  .
.                  .
.                  .
002A       RETADR  RESW     1
.                  .
.                  .
.                  .
0033       BUFFER  RESW     4096
1033       BUFEND  EQU      *
1033       MAXLEN  WORD     BUFEND-BUFFER
           .       Subroutine to Read Record into Buffer
0000       RDREC   CSECT
                   EXTREF   BUFFER, BUFEND
0000                CLEAR    X
0002       MAXLEN  EQU      BUFEND-BUFFER
```

c) State the differences between literals and immediate operands. CO2 (04)

UNIT - III

5. a) Provide the algorithm for a linking loader. Discuss the data structures used. CO3 (10)

b) For the given object program explain how relocation is achieved using bit masks. Provide the output of the relocation loaders given that the starting address given by the operating system is 3000. CO3 (05)

Input File:

H COPY 000000 00

T 000000 12 C40 141033 481039 901776 921765 345610 571765

T 002011 0F E00 232838 432979 892060 662849 340000

E 000000

c) With a flowchart discuss the processing of an object program using linkage editors. CO3 (05)

6. a) Provide and describe the source code of the bootstrap loader for SIC/XE. CO3 (10)

b) What is dynamic linking? Describe the process of loading and calling of a subroutine using dynamic linking. CO3 (10)

UNIT – IV

7. a) Expand the following macro invocation statements using the given macro definition- CO4 (06)

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Function f2,Q,(10,20,30) followed by
Function f1,R, 40

Macro definition

```
Function   MACRO   &I, &Len, &List
&C1        SET     %NITEMS(&List)
+LDT       #4096
$Loop      TD      =X'&I'
JEQ        $Loop
RD         =X'&I'
&C2        SET     1
WHILE ( &C2  LE  &C1)
COMP       =X'0000&List[&C2]'
JEQ        $Exit
&C2        SET     &C2+1
ENDW
TIXR       T
JLT        $Loop
&Exit      STX     &Len
MEND
```

b) Illustrate the concept of recursive macro expansion. CO4 (05)

c) Write the one-pass macroprocessor algorithm. CO4 (09)

8. a) Write a note on General purpose macro processors. CO4 (06)

b) Elaborate on the various data structures required by the macro processor. For the given macro and the macro call (RDB F3, BUFF, LEN) discuss about the data stored in these data structures. CO4 (08)

```
RDB   MACRO &IN, &BU, &REC
CLEAR X
CLEAR A
+LDT #4096
TD =X'&IN'
JEQ *-3
RD =X'&IN'
COMPR A,S
JEQ *+11
STCH &BU,X
TIXR T
JLT *-19
STX &REC
MEND
```

c) Discuss the features of the MASM macroprocessors. CO4 (06)

UNIT - V

9. a) Discuss the following with respect to Lex and Yacc. CO5 (06)
   i) yywrap() ii) yylex() iii) yyerror()

b) Write a Yacc program to recognize the given arithmetic expression having =,-,*, / and unary operators. CO5 (07)

c) What is regular expression? Explain any 5 characters that form regular expression CO5 (07)

10 a) With an example explain the structure of YACC program. CO5 (06)

b) Describe shift/reduce parsing with an example. CO5 (07)

c) Write a Lex program to count the number of characters, words and lines in a given input file. CO5 (07)

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IS62B2

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MAKEUP EXAMINATIONS – MAY/JUNE 2017

Course & Branch	:	B.E : Information Science and Engineering	Semester	:	VI
Subject	:	Distributed Storage Technologies	Max. Marks	:	100
Subject Code	:	IS62B2	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1.	a)	Define data and give some examples of data. Also list and explain the factors contributing to the growth of digital data.	CO1	(04)
	b)	What are the key characteristics of a Data Center? Explain in detail.	CO1	(08)
	c)	Discuss in detail about the Volume manager.	CO1	(08)
2.	a)	What are the core elements of a Data Center? Explain with an example of Online Order Transaction System.	CO1	(08)
	b)	Consider the disk specifications as average seek time 5ms, disk rotation speed 7200 rpm and the internal data transfer rate 40 MB/s. Calculate the maximum IOPS serviced for different block sizes 4KB, 8KB, 16KB, 32KB, 64KB.	CO1	(08)
	c)	Discuss the benefits and limitations of DAS.	CO1	(04)

UNIT - II

3.	a)	What is Write Penalty? Mention the Write Penalty for RAID 1, RAID 5 and RAID 6.	CO2	(02)
	b)	Consider an application that generates 5200 IOPS, with 60% of them being reads. Compute the disk load for RAID 1, RAID 5 and RAID 6. Also calculate the number of disks required to meet the workload for RAID 1, RAID 5 and RAID 6 if the HDD having maximum of 180 IOPS.	CO2	(10)
	c)	Define Cache and explain Read Operation with a neat diagram.	CO2	(08)
4.	a)	Give the comparison of all the RAID Levels with respect to minimum of 5 parameters.	CO2	(10)
	b)	With neat diagrams, explain the types of Intelligent Storage Systems.	CO2	(10)

UNIT - III

5.	a)	List and Explain the different Switched Fabric Ports with a neat diagram.	CO3	(07)
	b)	Discuss the Switched Fabric Login types.	CO3	(04)
	c)	Categorize the topologies used to implement iSCSI and explain.	CO3	(09)
6.	a)	What is Zoning? Explain the types of Zoning with a neat diagram.	CO3	(10)
	b)	Explain in detail the Components of an FCoE Network.	CO3	(10)

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UNIT - IV

7.	a)	What are the factors affecting the NAS performance? Explain.	CO4	(10)
	b)	Discuss how a health care organization deployed CAS to store patient details.	CO4	(05)
	c)	How the data storage process performed in OSD system? Explain	CO4	(05)
8.	a)	Illustrate the NAS I/O Operation with a neat diagram.	CO4	(05)
	b)	Discuss the features and benefits of CAS.	CO4	(10)
	c)	Explain the NFS Protocol in detail.	CO4	(05)

UNIT - V

9.	a)	Discuss the various activities in BC planning life cycle.	CO5	(10)
	b)	Write a note on Threats.	CO5	(04)
	c)	Explain the four security goals that built around Information Security Framework.	CO5	(06)
10.	a)	Classify the Cloud Service Offerings and explain with neat sketches.	CO5	(10)
	b)	What is Information Lifecycle Management? Describe the key challenges to be addressed with ILM. Also mention the ILM benefits.	CO5	(10)

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IS631/IS52A3/IS513

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SUPPLEMENTARY SEMESTER EXAMINATIONS – AUGUST 2017

Course & Branch	:	B.E : Information Science and Engineering	Semester	:	VI
Subject	:	System Software	Max. Marks	:	100
Subject Code	:	IS631/IS52A3.IS513	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1. a) Write a SIC program to add the corresponding elements of the two arrays Aarray and Barray and store the result in the elements of Carray. CO1 (06)

   b) Discuss the pass 1 of a two pass SIC assembler. CO1 (06)

   c) Illustrate the role of the following assembler directives: CO1 (08)
   i. RESW ii. RESB iii. BYTE iv. WORD.

2. a) Generate the object code and the symbol table for the following SIC program. Also given below is opcode table. CO1 (10)

```
LDX ZERO
INLOOP   TD INDEV
JEQ INLOOP
RD INDEV
STCH DATA
MOVE     LDCH STR1, X
STCH STR2, X
TIX MOVE

STR1 BYTE C'ABCD'
STR2 RESB 4
ZERO WORD 0
INDEV BYTE X'F1'
DATA RESB 1
```

Instruction	Opcode
LDX	04
LDCH	50
JEQ	30
RD	D8
STCH	54
TIX	2C
TD	E0

   b) Discuss the SIC machine architecture. CO1 (10)

UNIT - II

3. a) With examples explain the role of the 'n', 'i', 'x', 'b' flags in the SIC/XE instructions. CO2 (08)

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b) Generate the object code and the symbol table for the following SIC/XE program using two-pass assemblers. Given below is opcode table. CO2 (12)

```
SIC/XE Program
FIRST   CLEAR X
        CLEAR A
        LDCH =X '04'
        RMO A,S
        +LDT #4096
LOOP    TD =X 'F3'
        JEQ LOOP
        RD =X 'F3'
        COMPR A,S
        JEQ EXIT
        STCH BUF,X
        TIXR T
        JLT LOOP
EXIT    STX RECL

USE CDATA
LTORG
RECL RESW 1
BUF RESB 4096
```

Instruction	Opcode
CLEAR	B4
LDCH	50
RMO	AC
LDT	74
TD	E0
JEQ	30
RD	D8
COMPR	A0
STCH	54
TIXR	B8
JLT	38
STX	10

4. a) Obtain the object program for the following SIC/XE code. Given below is the SIC/XE program with address and object code of each of the instructions. CO2 (08)

Address	Instruction	Object code
0000	PROGA START 0 EXTDEF LA,EA EXTREF LB,EB,LC,EC	
0020	REF1 LDA LA	03201D
0023	REF2 +LDT LB+4	77100004
0027	REF3 LDX #EA-LA	050014
0040	LA EQU *	
0054	EA EQU *	
0054	REF4 WORD EA-LA+LC	000014
0057	REF5 WORD EC-LC-10	FFFFF6
005A	REF6 WORD EC-LC+LA-1	00003F
005D	REF7 WORD EA-LA-(EB-LB)	000014
0060	REF8 WORD LB-LA	FFFFC0
	END	

b) Discuss the working of load and go one pass assembler. CO2 (08)

c) Define the terms: CO2 (04)

i. Literals ii. Program blocks iii. Control section iv. Forward Reference

UNIT - III

5. a) Explain the two methods for specifying relocation as a part of object program. CO3 (10)

b) Write the two pass linking loader assembler algorithm. CO3 (10)

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6. a) What is a bootstrap loader? Write an algorithm of bootstrap loader for SIC/XE machine. CO3 (10)

b) Illustrate with an example, the concept of program linking. CO3 (10)

UNIT – IV

7. a) Illustrate with an example and explain the data structures involved in one pass macro processor algorithm. CO4 (07)

b) Write the expanded file for the following code CO4 (07)

```
P8          START   0
MOVE        MACRO   &FROM,&TO
&LENGTH     SET %SIZEOF(&FROM)
IF  (&LENGTH EQ 1)
LDCH &FROM
STCH &TO
ELSE
LDX #&LENGTH
LDS #FROM
LDT #TO
JSUB
ENDIF
MEND
FIRST       MOVE A,B
MOVE C,D
RSUB
A           RESB 1
B           RESB 500
C           RESB 500
D           RESB 500
END
```

(%SIZEOF returns the number of byte occupied by the corresponding argument)

c) Explain the advantage and disadvantage of general purpose macro processor. CO4 (06)

8. a) Using the following definition, expand the following macro invocation statement. CO4 (06)

i. RDBUFF F2, BUF, LENG, (00, 03, 04)

ii. RDBUFF F1, BUF, LENG, (O4, 12)

```
RDBUFF   MACRO   &INDEV,&BADR,&RECL,&EOR
&EORCT   SET %NITEMS(&EOR)
CLEAR X
CLEAR A
+LDT #4096
$LOOP    TD =X'&INDEV'
JEQ $LOOP
&CTR     SET 1
WHILE (&CTR LE &EORCT)
COMP =X'0000&EOR[&CTR]'
JEQ $EXIT
&CTR     SET &CTR+1
ENDW
STCH &BADR, X
TIXR T
JLT $LOOP
$EXIT    STX &RECL
MEND
```


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b) What are the independent macro features? Explain any three with an example. CO4 (06)

c) Write a short note on MASM macro processor. CO4 (08)

UNIT - V

9. a) Explain the structure of lex program supported with a typical example. CO5 (08)

b) What do the following notations of regular expression match? Describe with an example. CO5 (06)

i) . ii) * iii) ^ iv) $ v) {} vi) ?

c) Write a lex program to recognize following list of verbs. CO5 (06)

is, was, do, am, are.

10. a) Explain the structure of a YACC program. CO5 (06)

b) Give the LEX and YACC specifications to recognize parenthesized arithmetic expressions. CO5 (08)

c) Write a LEX program to count the number of vowels and consonants in a given string. CO5 (06)

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IS61B1

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SUPPLEMENTARY SEMESTER EXAMINATIONS – AUGUST 2017

Course & Branch	:	B.E.–Information Science & Engineering	Semester	:	VI
Subject	:	Information Storage and Management	Max. Marks	:	100
Subject Code	:	IS61B1	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1.	a)	What is Big Data? Identify the components of the Big Data Ecosystem.	CO1	(06)
	b)	The average I/O size of an application is 16 KB. The following specifications are available from the disk manufacturer: average seek time = 6 ms, 10000 rpm, transfer rate of 40 MB/s. Determine the maximum IOPS that could be performed with the disk for this application.	CO1	(08)
	c)	Discuss the basic components of a LVM.	CO1	(06)
2.	a)	With a block diagram of an example system, briefly explain the five core elements of a data center.	CO1	(07)
	b)	Distinguish with diagrams Block level and File level access of data over a network.	CO1	(08)
	c)	Discuss the command queuing methods implemented to improve disk performance.	CO1	(05)

UNIT – II

3.	a)	Discuss the RAID 5 and RAID 6 storage technologies with suitable diagrams.	CO2	(08)
	b)	What is a HOT Spare? Discuss its' implementation methods.	CO2	(06)
	c)	Discuss with a diagram the structure of the cache in an ISS.	CO2	(06)
4.	a)	Distinguish the Hardware and Software implementation techniques for RAID.	CO2	(06)
	b)	Discuss the RAID 3, RAID 4 and RAID 5 storage technologies with suitable diagrams.	CO2	(08)
	c)	Briefly discuss the cache data protection methods.	CO2	(06)

UNIT – III

5.	a)	Describe the common FC fabric services.	CO3	(08)
	b)	Describe the different types of login in a FC switched network.	CO3	(06)
	c)	Illustrate with the help of a diagram the role of an FCoE switch in an FCoE network.	CO3	(06)
6.	a)	Describe data transmission in a Switched Fabric configuration involving four nodes with a sample diagram.	CO3	(06)

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	b)	Why is it required to have an iSCSI discovery process? What are the possible ways of implementing it?	CO3	(08)
	c)	Discuss FCIP with the help of a topology diagram.	CO3	(06)

UNIT – IV

7.	a)	Illustrate with the help of diagrams how File-level virtualization helps non-disruptive file mobility.	CO4	(10)
	b)	Explain the object storage and retrieval process in OSD using diagrams.	CO4	(10)
8.	a)	Illustrate with the help of a diagram how the Scale-out NAS implementation helps in addressing the NAS scalability issue.	CO4	(06)
	b)	Describe with the help of a diagram the components of an OSD.	CO4	(04)
	c)	Describe the process of handling Block, File and Object I/O requests in a unified storage system with a diagram.	CO4	(10)

UNIT – V

9.	a)	Describe briefly with diagrams public and private cloud deployment models.	CO5	(10)
	b)	Discuss threats and the strategies for security in the three storage security domains.	CO5	(10)
10.	a)	Discuss with example diagrams the issue of Single Point of Failure and the Fault Tolerant Solution to mitigate it.	CO5	(10)
	b)	Discuss with diagrams Intra-array and Inter-array storage tiering.	CO5	(10)

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4 Sem

IS61B1

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SUPPLEMENTARY SEMESTER EXAMINATIONS – AUGUST 2017

Course & Branch : B.E.-Information Science & Engineering
Subject : Information Storage and Management
Subject Code : IS61B1

Semester : VI
Max. Marks : 100
Duration : 3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1.	a)	What is Big Data? Identify the components of the Big Data Ecosystem.	CO1	(06)
	b)	The average I/O size of an application is 16 KB. The following specifications are available from the disk manufacturer: average seek time = 6 ms, 10000 rpm, transfer rate of 40 MB/s. Determine the maximum IOPS that could be performed with the disk for this application.	CO1	(08)
	c)	Discuss the basic components of a LVM.	CO1	(06)
2.	a)	With a block diagram of an example system, briefly explain the five core elements of a data center.	CO1	(07)
	b)	Distinguish with diagrams Block level and File level access of data over a network.	CO1	(08)
	c)	Discuss the command queuing methods implemented to improve disk performance.	CO1	(05)

UNIT – II

3.	a)	Discuss the RAID 5 and RAID 6 storage technologies with suitable diagrams.	CO2	(08)
	b)	What is a HOT Spare? Discuss its' implementation methods.	CO2	(06)
	c)	Discuss with a diagram the structure of the cache in an ISS.	CO2	(06)
4.	a)	Distinguish the Hardware and Software implementation techniques for RAID.	CO2	(06)
	b)	Discuss the RAID 3, RAID 4 and RAID 5 storage technologies with suitable diagrams.	CO2	(08)
	c)	Briefly discuss the cache data protection methods.	CO2	(06)

UNIT – III

5.	a)	Describe the common FC fabric services.	CO3	(08)
	b)	Describe the different types of login in a FC switched network.	CO3	(06)
	c)	Illustrate with the help of a diagram the role of an FCoE switch in an FCoE network.	CO3	(06)
6.	a)	Describe data transmission in a Switched Fabric configuration involving four nodes with a sample diagram.	CO3	(06)

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	b)	Why is it required to have an iSCSI discovery process? What are the possible ways of implementing it?	CO3	(08)
	c)	Discuss FCIP with the help of a topology diagram.	CO3	(06)

UNIT – IV

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	b)	Explain the object storage and retrieval process in OSD using diagrams.	CO4	(10)
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	b)	Describe with the help of a diagram the components of an OSD.	CO4	(04)
	c)	Describe the process of handling Block, File and Object I/O requests in a unified storage system with a diagram.	CO4	(10)

UNIT – V

9.	a)	Describe briefly with diagrams public and private cloud deployment models.	CO5	(10)
	b)	Discuss threats and the strategies for security in the three storage security domains.	CO5	(10)
10.	a)	Discuss with example diagrams the issue of Single Point of Failure and the Fault Tolerant Solution to mitigate it.	CO5	(10)
	b)	Discuss with diagrams Intra-array and Inter-array storage tiering.	CO5	(10)

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4th sem

IS624

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SEMESTER END EXAMINATIONS – MAY/JUNE 2017

Course & Branch	:	B.E : Information Science and Engineering	Semester	:	VI
Subject	:	Java and J2EE	Max. Marks	:	100
Subject Code	:	IS624	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1. a) Create a class called hospital with the data members (patient_no – integer, patient_name String, phone_no: integer, treatment: string), and following methods : CO1 (10)
   i) getInput() to record the data of the patient.
   ii) suggestTreatment() method which suggests a treatment for certain diseased like headache, body pain, fever, common cold.
   iii) Deposit() method to deposit the treatment amount.
   iv) Throw exception for depositing amount less than 5000.

   b) Explain the keywords: this, super, static, final and throws. Write a program to create a class called shape and find area of square and rectangle. Use the above mentioned keywords in the program. CO1 (10)

2. a) Explain different level of access specifiers in different levels of accessing classes and packages with a neat table. Also write small snippets of code to demonstrate the role of access specifiers used in java. CO1 (10)

   b) Write a java program to implement push, pop and display functions on a ***dynamic stack***. Define push, pop and display in an interface and implement the interface in a class. Also use parameterized constructor to allocate and initialize the variables. CO1 (10)

UNIT - II

3. a) Create a collection (LinkedList) of customers. Customer details include name, age, profession and salary. Traverse through the collection. If the salary is < 1,00,000 print a message saying "Not eligible for loan". CO2 (08)

   b) Discuss the methods of the Map interface. CO2 (06)

   c) Discuss any 3 exceptions that would occur while using the methods of the Collection Interface. CO2 (06)

4. a) Explain the constructors of the HashSet and LinkedList collection classes. CO2 (06)

   b) Create an array of 10 integers. Store values -3*I at location (index)I. Using the methods of the Arrays class do the following CO2 (08)
      i) Search for an element -27 in this array
      ii) Copy the contents of this array to another array
      iii) Compare the two arrays
      iv) Place element -1 from index location 2 to 6
      v) Sort the elements from location 3 to 9.

      Write a function Display to display the elements of the array after every step.

   c) Write a java program to read an array of integers. Generate a hashmap<Integer,Integer> from the array holding the integer and the number of times it occurred in the array. CO2 (06)

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UNIT - III

5.	a)	What are the Swing Basic Containers? Explain any three components of the root pane class.	CO3	(10)
	b)	Write a Java program to create four checkboxes named 'INDIA', 'CHINA', 'KOREA', 'JAPAN' and a text field with flow layout left. When you click, any of these checkboxes, the label of the respective check box will get displayed in the text field.	CO3	(10)
6.	a)	Illustrate the working of option dialog box with an example.	CO3	(07)
	b)	List any four methods provided by the JTextArea class.	CO3	(06)
	c)	Develop a java program to create a frame to find the factorial of a number which is entered in text field 1.When you press button captioned "find factorial" result is displayed in text field 2.When you press button captioned "clear" then values present in the text field should clear.	CO3	(07)

UNIT – IV

7.	a)	Explain the different types of JDBC Drivers.	CO4	(08)
	b)	What are the three different ways to execute a query when you establish a database connection? Write the syntax of each. Illustrate these statements with an example.	CO4	(07)
	c)	Create a login page to check for valid login id and password using Servlets.	CO4	(05)
8.	a)	With the diagram explain the interaction of JDBC with the databases.	CO4	(08)
	b)	Discuss the life cycle of a Thread.	CO4	(06)
	c)	Write a program to add n numbers where the job is distributed among two threads. Use Runnable interface.	CO4	(06)

UNIT - V

9.	a)	Explain the usage of JSP directives with code snippets.	CO5	(10)
	b)	Write a JSP program to buy a mobile online. Display 10 models of phones and upon selection of a particular phone the page is redirected to checkout. Create an order number and display a success message on purchase or redirect to error page on failure of purchase.	CO5	(10)
10.	a)	Write a Java Bean program to convert a currency amount entered by user in INR to USD.	CO5	(10)
	b)	With a neat diagram explain Stateless Session Bean and Stateful Session Bean.	CO5	(10)

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RAMAIAH
INSTITUTE OF TECHNOLOGY

(Autonomous Institute, Affiliated to VTU)
Bangalore – 560 054

MAKEUP EXAMINATIONS – MAY/JUNE 2017

Course & Branch	:	B.E : Information Science and Engineering	Semester	:	VI
Subject	:	Java and J2EE	Max. Marks	:	100
Subject Code	:	IS624	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1.	a)	Write an interface Queue with methods insert_front() and delete_rear(). Define a QueueImplement class that implements the interface Queue based on the operations of the float type queue data structure. Raise IsFullException and IsEmptyException when the queue is full and empty respectively.	CO1	(10)
	b)	Explain the role of enumerations with suitable illustrations.	CO1	(04)
	c)	How are packages created in java? Write a java program that addresses the categories of visibility for class members in a package.	CO1	(06)
2.	a)	Write a java program to read a file "input.txt" and copy every alternate character to an output file "out1.txt". Also, from the second half of the "input.txt" copy a character that is a number or a special character to an output file "out2.txt".	CO1	(08)
	b)	Indicate the usage of final keyword in class, interface and methods.	CO1	(06)
	c)	Differentiate between: i) interface and abstract classes. ii) Autoboxing and type casting.	CO1	(06)

UNIT - II

3.	a)	Use Linked List class and create a list of 20 participants applied for sports at university sports meet. Sort the list according to number of medals won in previous events and shortlist first 7 athletes who have won more than 4 medals. Copy on to another list of shortlisted candidates and display the same.	CO2	(10)
	b)	Define Collection Interfaces. List and explain 10 collection methods.	CO2	(10)
4.	a)	List and explain any Array class algorithms.	CO2	(10)
	b)	Write a Program that simulates a telephone that records missed incoming calls. For each missed call, store the time of call, telephone number of origin, and name of the caller if the name is available. Choose or extend the most appropriate collection class and provide the following features. i) Numbers are recalled in the order they arrive ii) Up to 10 numbers are recorded. When the eleventh call comes in, it is stored and the oldest call is deleted so that no more than 10 numbers are ever recorded. iii) Display the call details.	CO2	(10)

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UNIT - III

5. a) Create a Java Swing application to record the details of books and various documents which are available under the library room. Maintain the list of the students on a LinkedList who will take the services of their library campus. Show creation of database and its tables. CO3 (10)

   b) Compare between Swing and AWT. Also Explain Swing basic containers with a neat diagram. CO3 (10)

6. a) Explain any 10 swing components. CO3 (10)

   b) Create a swing based application to get details of a person like Basic,TA,DA and HRA. Calculate the eligibility of loan based on Total pay, If a person is drawing CO3 (10)

      i) Less than 5 lakh pa, he is not eligible.

      ii) More than 5 lakh pa, less than 10 lakh pa ,eligible for loan of 10 lakh.

      iii) Above 10 lakh pa eligible for loan above 10 lakh.

      Display the information on JOptionPane.

UNIT – IV

7. a) List any 4 advantages of JDBC. With a diagram explain the interaction of the JDBC with databases. CO4 (10)

   b) Write a Java Program that creates two threads. One thread asks the user to enter a number, count the digits of the number and reverse the number. Second thread finds the number of vowels in a given string. CO4 (10)

8. a) Discuss the different stages of Thread Life cycle. CO4 (06)

   b) Indicate the role of the ServletRequest and ServletResponse interfaces. Create a Servlet to accept personal information, insurance information and medical health details from the user and write the information of the person on the HTML page. CO4 (10)

   c) Define: CO4 (04)
      i) Servlet ii) JDBC iii) Multithreading
      iv) Servlet Application Programming Interface.

UNIT - V

9. a) Write the syntax of <jsp:forward> action tag without parameter. Illustrate with an example. CO5 (10)

   b) Write a program to that forms java based client application and invokes the helloAdvise() method in the deployed bean. CO5 (10)

10. a) Create a front end to enter train booking details and print confirmation along with booking details on the web page using JSP. CO5 (10)

    b) Discuss the three types of enterprise beans defined in the EJB architecture. CO5 (10)

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RAMAIAH
INSTITUTE OF TECHNOLOGY

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Bangalore – 560 054

SUPPLEMENTARY SEMESTER EXAMINATIONS – AUGUST 2017

Course & Branch	:	B.E : Information Science and Engineering	Semester	:	VI
Subject	:	Java and J2EE	Max. Marks	:	100
Subject Code	:	IS624/IS624E	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1. a) Illustrate with an example the uses of super keyword. CO1 (06)

   b) What will be the output of the following program? Explain your answer. CO1 (08)

```
i) import java.util.*;
public class Sample
{
        public static void main(String[] args)
        {
            ArrayList list=null;
            try{
                list.add(1,new Integer(1));
            }catch(Exception ex){
            System.out.println(ex);
            }
        }
    }
ii) class A{
final void math(){
    System.out.println("Class A");
 }
 }
class B extends A{
void math(){
    System.out.println("Class B");
 }
 }
```

   c) Write a java program to traversing ArrayList in forward direction using List Iterator. CO1 (06)

2. a) Discuss with an example four methods defined by List interface. CO1 (08)

   b) i) Find the errors in the following code. CO1 (06)

```
class ThrowsDemo{
        static void throwOne(){
        System.out.println("inside throwOne");
        throw new IllegalAccessException("demo");}
        public static void main(String args[]){
        throwOne();
        }
        }
```

   ii)Is the following code legal?

```
try {
    ---
} finally {
}
```


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c) Explain dynamic method dispatch with an example. CO1

UNIT - II

3. a) What is Map? Discuss the interfaces which support maps. CO2
   b) Write a Java program to copy the contents of one HashMap to another HashMap. CO2
   c) Write a Java program to demonstrate storing user-defined Objects in a collection. CO2

4. a) With an example discuss how do you obtain an array from an ArrayList. CO2
   b) What are the different ways to traverse a List? Illustrate each with an example. CO2
   c) Implement the Queue data structure using LinkedList class. CO2

UNIT - III

5. a) Write java code to display a form accepting customer details (custid, name, rating (use checkbox), benefits_offered(text area) and a button submit). On clicking on the submit button CO3
      i) if rating is 2 star display dialog box indicating the benefits offered as 200points.
      ii) If rating is 4 star display dialog box indicating the benefits offered as 400 points.
      iii) If rating is 5 star display dialog box indicating the benefits offered as 500 points.

      Place the consolidated details of the customer in another dialog box.
   b) Explain the key features of Java Foundation Classes and Swings. CO3
   c) With a suitable diagram, explain the components of the root pane class. CO3

6. a) Create a Swing program to enter patient information. It should receive the following inputs from the user. (i) Patient Name (ii) Patient Address (iii) Create checkboxes which specify the tests to be conducted: Blood test, Urine Test, Ultra-sound scan, MRI scans (iv) Specialist to be consulted in list- Neurologist, Gynacologist, Dentist and Surgeon. (v) Radio buttons to enter payment options: Cash, Cheque and Credit Card. (vi) Provide a submit button: CO3
      - If the radio button cash is selected, insert the remaining amount of cash to be paid in the text area.
      - If the radio button cheque is selected, allow the user to enter cheque number, bank and branch details.
      - If the radio button credit card is selected, forward to the payment gateway and allow the user to enter the CVV, Expiry date and Name_on_the_card details.
   b) List and Explain any 10 Swing Components. CO3

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UNIT – IV

a) Explain Lifecycle of a Servlet with a neat diagram. List any two classes and interfaces required for the Servlet. CO4 (10)

b) Create a Servlet to file IT returns that accepts personal information, salary information and Tax deduction details from the user and write the information into a file. Also accept the name of the person and display in on the page. CO4 (10)

a) Write a Java program to create two threads. One thread displays the current time after a sleep of 5 seconds and the second thread displays random message stored on an array list. CO4 (10)

b) Write a Servlet program to grade a student based on marks with following parameters: CO4 (10)

i) Above 90% is S grade

ii) Within 80% to 90% is A grade

iii) Within 70% to 80% is B grade

iv) Within 60% to 70% is C grade

v) Within 50% to 60% is D grade

vi) Less than 50% is F grade.

UNIT - V

9. a) Create a jsp file that allows the user to enter the starting and destination location. On the click of the submit button check the starting and destination values. If not same, then forward to the train_details.jsp to display the list of other trains running from source station to destination station. Else print a message indicating "Incorrect Details". CO5 (10)

b) Explain the different types of Enterprise beans in java. CO5 (10)

10. a) With help of a neat diagram, explain life cycle of a JSP Page. CO5 (06)

b) Illustrate the working of Enterprise Bean with an example. CO5 (08)

c) Create a main.jsp (included file) which fetches the name, account number and amount to be withdrawn as parameters from included file bankdetails.jsp. Assume a balance amount of Rs 2500/-. Display appropriate message to indicate whether the person can withdraw the amount or not. CO5 (06)

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M S RAMAIAH INSTITUTE OF TECHNOLOGY

(AUTONOMOUS INSTITUTE, AFFILIATED TO VTU)

BANGALORE – 560 054

MAKEUP EXAMINATIONS – JULY 2016

Course & Branch	: B.E. – Information Science & Engg.	Semester	: VI
Subject	: Java and J2EE	Max. Marks	: 100
Subject Code	: IS624 / IS624E	Duration	: 3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1. a) Explain data type conversion and casting feature of java with an example — CO1 (06)

   b) Write a java program to read 20 marks and store them in an array. Define your own exception. Make use of your own exception when a marks is < 0 and >100. — CO1 (08)

   c) Differentiate between with an example — CO1 (06)
      i. Interface and abstract class
      ii. Default and public access specifier.

2. a) Write a java program to read a string from the user. Count the number of consonants and vowels in this string. — CO1 (06)

   b) Create a user defined package to find all roots of quadratic equation. Write a program to use this package. — CO1 (08)

   c) i. Write a program to show with comparison operators (< or >). — CO1 (06)
      ii. Write a program to show the working of enumerations.

UNIT – II

3. a) Write a java program to create a list of addresses using Collections. If the **city** field of the address is "Bangalore", remove it from the existing list and add it to a new list. Display both the lists. — CO2 (10)

   b) Create an array of 10 integers with data being stored at an index I is -3*I. Using the methods of the Arrays class do the following — CO2 (10)
      i. Search for an element -27 in this array
      ii. Copy the contents of this array to another array
      iii. Compare the two arrays
      iv. Place element -1 from index location 2 to 6
      v. sort the elements from location 3 to 9.
      Write a function Display to display the elements of an array after every step.

4. a) Write a java program to help the shop owner to create a Map of his customer's id with the credit point. The customer id's are in the range 100 to 200. For customer's id from 105 to 120 update the credit points by 20 . For customer's id from 125 to 200 update the credit points by 30.
   Display the customer map. — CO2 (08)

   b) Explain the constructors of the HashSet and LinkedList collection classes. — CO2 (06)

   c) Discuss any 3 exceptions that would occur while using the methods of the Collection Interface. — CO2 (06)

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UNIT – III

5. a) List any five Commonly used Methods of AbstractButton class in swings and write a program for displaying image on the button in the frame window and clicking on image button the hello message should display in JDialog. CO3 (10)

   b) Discuss JFC. Write a program to handle mouse events for capturing a button click and display the approximate messagebox by capturing the position of button click. CO3 (10)

6. a) Create a swing application to convert the entered degree Celsius in a JTextField to Fahrenheit on click of a button and display the result in a JDialog. CO3 (10)

   b) Discuss three commonly used Constructors of JComboBox class. Write a program to create a JFrame and insert JComboBox class for displaying country list and insert a text box to take value to generate odd number from starting till enter valued by clicking on JButton. CO3 (10)

UNIT – IV

7. a) List any 4 advantages of JDBC. With a diagram explain the interaction of the JDBC with databases. CO4 (10)

   b) Write a Servlet program to accept details like patient_id, patient_name, price of an treatment from a HTML page and receive the parameters to a servlet. Calculate the percentage of discount based on following: CO4 (10)

   i) 10000 to 50000 Rs. Discount 10%
   ii) 50000 to 2,00,000 Rs Discount 20%
   iii) 2,00,000 to 10,00,000 Rs. Discount 35%

8. a) Indicate the role of the ServletRequest and ServletResponse interfaces. Create a Servlet to accept personal information, insurance information and medical health details from the user and write the information of the person on the HTML page. CO4 (10)

   b) Write a multi-threading program using Runnable Interface, to display odd and even numbers for a given value 'N'. Also create a new thread to print the square of even numbers. CO4 (10)

UNIT – V

9. a) Explain types of Enterprise Beans in Java. CO5 (10)

   b) Write a JSP application to acceptdetails of driver renting a car with following attributes Driver_Info(Name, DLno, Address, Phone_Number) and Car_Details(CarNo, RegisterNo, Type_of_car, Name_of_Car) and store it in the database. Also on click of submit the page should redirect to display page to show the entire booking details. CO5 (10)

10. a) Write a JSP application to search an e-book and subscribe it from a particular publication. Create three tables Books(ISBN, Title, Author, Publication), Users(UserID, Name, Age, Sex), Subscription(UserID, ISBN). Display the e-book to a particular user based on the subscription details. CO5 (10)

    (Assume the appropriate fields and files)

    b) With a neat diagram explain life cycle of JSP. CO5 (05)

    c) List and explain any 5 action elements in JSP. CO5 (05)

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4th Sem

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M S RAMAIAH INSTITUTE OF TECHNOLOGY

(AUTONOMOUS INSTITUTE, AFFILIATED TO VTU)

BANGALORE – 560 054

MAKEUP EXAMINATIONS – JULY 2016

Course & Branch	: B.E. – Information Science & Engg.	Semester	: VI
Subject	: Java and J2EE	Max. Marks	: 100
Subject Code	: IS624 / IS624E	Duration	: 3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1.	a)	Explain data type conversion and casting feature of java with an example	CO1	(06)
	b)	Write a java program to read 20 marks and store them in an array. Define your own exception. Make use of your own exception when a marks is < 0 and >100.	CO1	(08)
	c)	Differentiate between with an example i. Interface and abstract class ii. Default and public access specifier.	CO1	(06)
2.	a)	Write a java program to read a string from the user. Count the number of consonants and vowels in this string.	CO1	(06)
	b)	Create a user defined package to find all roots of quadratic equation. Write a program to use this package.	CO1	(08)
	c)	i. Write a program to show with comparison operators (< or >). ii. Write a program to show the working of enumerations.	CO1	(06)

UNIT – II

3.	a)	Write a java program to create a list of addresses using Collections. If the **city** field of the address is "Bangalore", remove it from the existing list and add it to a new list. Display both the lists.	CO2	(10)
	b)	Create an array of 10 integers with data being stored at an index I is -3*I. Using the methods of the Arrays class do the following i. Search for an element -27 in this array ii. Copy the contents of this array to another array iii. Compare the two arrays iv. Place element -1 from index location 2 to 6 v. sort the elements from location 3 to 9. Write a function Display to display the elements of an array after every step.	CO2	(10)
4.	a)	Write a java program to help the shop owner to create a Map of his customer's id with the credit point. The customer id's are in the range 100 to 200. For customer's id from 105 to 120 update the credit points by 20 . For customer's id from 125 to 200 update the credit points by 30. Display the customer map.	CO2	(08)
	b)	Explain the constructors of the HashSet and LinkedList collection classes.	CO2	(06)
	c)	Discuss any 3 exceptions that would occur while using the methods of the Collection Interface.	CO2	(06)

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UNIT – III

5. a) List any five Commonly used Methods of AbstractButton class in swings and write a program for displaying image on the button in the frame window and clicking on image button the hello message should display in JDialog. CO3 (10)

   b) Discuss JFC. Write a program to handle mouse events for capturing a button click and display the approximate messagebox by capturing the position of button click. CO3 (10)

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UNIT – IV

7. a) List any 4 advantages of JDBC. With a diagram explain the interaction of the JDBC with databases. CO4 (10)

   b) Write a Servlet program to accept details like patient_id, patient_name, price of an treatment from a HTML page and receive the parameters to a servlet. Calculate the percentage of discount based on following: CO4 (10)
   i) 10000 to 50000 Rs. Discount 10%
   ii) 50000 to 2,00,000 Rs Discount 20%
   iii) 2,00,000 to 10,00,000 Rs. Discount 35%

8. a) Indicate the role of the ServletRequest and ServletResponse interfaces. Create a Servlet to accept personal information, insurance information and medical health details from the user and write the information of the person on the HTML page. CO4 (10)

   b) Write a multi-threading program using Runnable Interface, to display odd and even numbers for a given value 'N'. Also create a new thread to print the square of even numbers. CO4 (10)

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9. a) Explain types of Enterprise Beans in Java. CO5 (10)

   b) Write a JSP application to acceptdetails of driver renting a car with following attributes Driver_Info(Name, DLno, Address, Phone_Number) and Car_Details(CarNo, RegisterNo, Type_of_car, Name_of_Car) and store it in the database. Also on click of submit the page should redirect to display page to show the entire booking details. CO5 (10)

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    (Assume the appropriate fields and files)

    b) With a neat diagram explain life cycle of JSP. CO5 (05)

    c) List and explain any 5 action elements in JSP. CO5 (05)

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MAKEUP EXAMINATIONS – MAY/JUNE 2017

Course & Branch	: B.E : Information Science and Engineering	Semester	: VI
Subject	: Java and J2EE	Max. Marks	: 100
Subject Code	: IS624	Duration	: 3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1. a) Write an interface Queue with methods insert_front() and delete_rear(). Define a QueueImplement class that implements the interface Queue based on the operations of the float type queue data structure. Raise IsFullException and IsEmptyException when the queue is full and empty respectively. CO1 (10)

   b) Explain the role of enumerations with suitable illustrations. CO1 (04)

   c) How are packages created in java? Write a java program that addresses the categories of visibility for class members in a package. CO1 (06)

2. a) Write a java program to read a file "input.txt" and copy every alternate character to an output file "out1.txt". Also, from the second half of the "input.txt" copy a character that is a number or a special character to an output file "out2.txt". CO1 (08)

   b) Indicate the usage of final keyword in class, interface and methods. CO1 (06)

   c) Differentiate between: CO1 (06)
      i) interface and abstract classes.
      ii) Autoboxing and type casting.

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3. a) Use Linked List class and create a list of 20 participants applied for sports at university sports meet. Sort the list according to number of medals won in previous events and shortlist first 7 athletes who have won more than 4 medals. Copy on to another list of shortlisted candidates and display the same. CO2 (10)

   b) Define Collection Interfaces. List and explain 10 collection methods. CO2 (10)

4. a) List and explain any Array class algorithms. CO2 (10)

   b) Write a Program that simulates a telephone that records missed incoming calls. For each missed call, store the time of call, telephone number of origin, and name of the caller if the name is available. Choose or extend the most appropriate collection class and provide the following features. CO2 (10)
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      ii) Up to 10 numbers are recorded. When the eleventh call comes in, it is stored and the oldest call is deleted so that no more than 10 numbers are ever recorded.
      iii) Display the call details.

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UNIT - III

5. a) Create a Java Swing application to record the details of books and various documents which are available under the library room. Maintain the list of the students on a LinkedList who will take the services of their library campus. Show creation of database and its tables. CO3 (10)

   b) Compare between Swing and AWT. Also Explain Swing basic containers with a neat diagram. CO3 (10)

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   b) Create a swing based application to get details of a person like Basic,TA,DA and HRA. Calculate the eligibility of loan based on Total pay, If a person is drawing CO3 (10)

      i) Less than 5 lakh pa, he is not eligible.

      ii) More than 5 lakh pa, less than 10 lakh pa ,eligible for loan of 10 lakh.

      iii) Above 10 lakh pa eligible for loan above 10 lakh.

      Display the information on JOptionPane.

UNIT – IV

7. a) List any 4 advantages of JDBC. With a diagram explain the interaction of the JDBC with databases. CO4 (10)

   b) Write a Java Program that creates two threads. One thread asks the user to enter a number, count the digits of the number and reverse the number. Second thread finds the number of vowels in a given string. CO4 (10)

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   b) Indicate the role of the ServletRequest and ServletResponse interfaces. Create a Servlet to accept personal information, insurance information and medical health details from the user and write the information of the person on the HTML page. CO4 (10)

   c) Define: CO4 (04)
      i) Servlet ii) JDBC iii) Multithreading
      iv) Servlet Application Programming Interface.

UNIT - V

9. a) Write the syntax of <jsp:forward> action tag without parameter. Illustrate with an example. CO5 (10)

   b) Write a program to that forms java based client application and invokes the helloAdvise() method in the deployed bean. CO5 (10)

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    b) Discuss the three types of enterprise beans defined in the EJB architecture. CO5 (10)

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SUPPLEMENTARY SEMESTER EXAMINATIONS – AUGUST 2017

Course & Branch	:	B.E : Information Science and Engineering	Semester	:	VI
Subject	:	Java and J2EE	Max. Marks	:	100
Subject Code	:	IS624/IS624E	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1. a) Illustrate with an example the uses of super keyword. CO1 (06)

   b) What will be the output of the following program? Explain your answer. CO1 (08)

```
i) import java.util.*;
public class Sample
{
        public static void main(String[] args)
        {
            ArrayList list=null;
            try{
                list.add(1,new Integer(1));
            }catch(Exception ex){
            System.out.println(ex);
            }
        }
    }
ii) class A{
final void math(){
    System.out.println("Class A");
 }
 }
class B extends A{
void math(){
    System.out.println("Class B");
 }
 }
```

   c) Write a java program to traversing ArrayList in forward direction using List Iterator. CO1 (06)

2. a) Discuss with an example four methods defined by List interface. CO1 (08)

   b) i) Find the errors in the following code. CO1 (06)

```
class ThrowsDemo{
        static void throwOne(){
        System.out.println("inside throwOne");
        throw new IllegalAccessException("demo");}
        public static void main(String args[]){
        throwOne();
        }
        }
```

   ii)Is the following code legal?

```
try {
    ---
} finally {
}
```


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c) Explain dynamic method dispatch with an example. CO1 (06)

UNIT - II

3. a) What is Map? Discuss the interfaces which support maps. CO2 (07)
   b) Write a Java program to copy the contents of one HashMap to another HashMap. CO2 (07)
   c) Write a Java program to demonstrate storing user-defined Objects in a collection. CO2 (06)

4. a) With an example discuss how do you obtain an array from an ArrayList. CO2 (04)
   b) What are the different ways to traverse a List? Illustrate each with an example. CO2 (07)
   c) Implement the Queue data structure using LinkedList class. CO2 (09)

UNIT - III

5. a) Write java code to display a form accepting customer details (custid, name, rating (use checkbox), benefits_offered(text area) and a button submit). On clicking on the submit button CO3 (08)
      i) if rating is 2 star display dialog box indicating the benefits offered as 200points.
      ii) If rating is 4 star display dialog box indicating the benefits offered as 400 points.
      iii) If rating is 5 star display dialog box indicating the benefits offered as 500 points.

      Place the consolidated details of the customer in another dialog box.
   b) Explain the key features of Java Foundation Classes and Swings. CO3 (06)
   c) With a suitable diagram, explain the components of the root pane class. CO3 (06)

6. a) Create a Swing program to enter patient information. It should receive the following inputs from the user. (i) Patient Name (ii) Patient Address (iii) Create checkboxes which specify the tests to be conducted: Blood test, Urine Test, Ultra-sound scan, MRI scans (iv) Specialist to be consulted in list- Neurologist, Gynacologist, Dentist and Surgeon. (v) Radio buttons to enter payment options: Cash, Cheque and Credit Card. (vi) Provide a submit button: CO3 (10)
      - If the radio button cash is selected, insert the remaining amount of cash to be paid in the text area.
      - If the radio button cheque is selected, allow the user to enter cheque number, bank and branch details.
      - If the radio button credit card is selected, forward to the payment gateway and allow the user to enter the CVV, Expiry date and Name_on_the_card details.
   b) List and Explain any 10 Swing Components. CO3 (10)

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UNIT – IV

7. a) Explain Lifecycle of a Servlet with a neat diagram. List any two classes and interfaces required for the Servlet. CO4 (10)

   b) Create a Servlet to file IT returns that accepts personal information, salary information and Tax deduction details from the user and write the information into a file. Also accept the name of the person and display in on the page. CO4 (10)

8. a) Write a Java program to create two threads. One thread displays the current time after a sleep of 5 seconds and the second thread displays random message stored on an array list. CO4 (10)

   b) Write a Servlet program to grade a student based on marks with following parameters: CO4 (10)

      i) Above 90% is S grade

      ii) Within 80% to 90% is A grade

      iii) Within 70% to 80% is B grade

      iv) Within 60% to 70% is C grade

      v) Within 50% to 60% is D grade

      vi) Less than 50% is F grade.

UNIT - V

9. a) Create a jsp file that allows the user to enter the starting and destination location. On the click of the submit button check the starting and destination values. If not same, then forward to the train_details.jsp to display the list of other trains running from source station to destination station. Else print a message indicating "Incorrect Details". CO5 (10)

   b) Explain the different types of Enterprise beans in java. CO5 (10)

10. a) With help of a neat diagram, explain life cycle of a JSP Page. CO5 (06)

    b) Illustrate the working of Enterprise Bean with an example. CO5 (08)

    c) Create a main.jsp (included file) which fetches the name, account number and amount to be withdrawn as parameters from included file bankdetails.jsp. Assume a balance amount of Rs 2500/-. Display appropriate message to indicate whether the person can withdraw the amount or not. CO5 (06)

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INSTITUTE OF TECHNOLOGY

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Bangalore – 560 054

SEMESTER END EXAMINATIONS – MAY/JUNE 2017

Course & Branch	:	B.E : Information Science and Engineering	Semester	:	VI
Subject	:	Java and J2EE	Max. Marks	:	100
Subject Code	:	IS624	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1. a) Create a class called hospital with the data members (patient_no – integer, patient_name String, phone_no: integer, treatment: string), and following methods : CO1 (10)
   i) getInput() to record the data of the patient.
   ii) suggestTreatment() method which suggests a treatment for certain diseased like headache, body pain, fever, common cold.
   iii) Deposit() method to deposit the treatment amount.
   iv) Throw exception for depositing amount less than 5000.

   b) Explain the keywords: this, super, static, final and throws. Write a program to create a class called shape and find area of square and rectangle. Use the above mentioned keywords in the program. CO1 (10)

2. a) Explain different level of access specifiers in different levels of accessing classes and packages with a neat table. Also write small snippets of code to demonstrate the role of access specifiers used in java. CO1 (10)

   b) Write a java program to implement push, pop and display functions on a ***dynamic stack***. Define push, pop and display in an interface and implement the interface in a class. Also use parameterized constructor to allocate and initialize the variables. CO1 (10)

UNIT - II

3. a) Create a collection (LinkedList) of customers. Customer details include name, age, profession and salary. Traverse through the collection. If the salary is < 1,00,000 print a message saying "Not eligible for loan". CO2 (08)

   b) Discuss the methods of the Map interface. CO2 (06)

   c) Discuss any 3 exceptions that would occur while using the methods of the Collection Interface. CO2 (06)

4. a) Explain the constructors of the HashSet and LinkedList collection classes. CO2 (06)

   b) Create an array of 10 integers. Store values -3*I at location (index)I. Using the methods of the Arrays class do the following CO2 (08)
      i) Search for an element -27 in this array
      ii) Copy the contents of this array to another array
      iii) Compare the two arrays
      iv) Place element -1 from index location 2 to 6
      v) Sort the elements from location 3 to 9.

      Write a function Display to display the elements of the array after every step.

   c) Write a java program to read an array of integers. Generate a hashmap<Integer,Integer> from the array holding the integer and the number of times it occurred in the array. CO2 (06)

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UNIT - III

5.	a)	What are the Swing Basic Containers? Explain any three components of the root pane class.	CO3	(10)
	b)	Write a Java program to create four checkboxes named 'INDIA', 'CHINA', 'KOREA', 'JAPAN' and a text field with flow layout left. When you click, any of these checkboxes, the label of the respective check box will get displayed in the text field.	CO3	(10)
6.	a)	Illustrate the working of option dialog box with an example.	CO3	(07)
	b)	List any four methods provided by the JTextArea class.	CO3	(06)
	c)	Develop a java program to create a frame to find the factorial of a number which is entered in text field 1.When you press button captioned "find factorial" result is displayed in text field 2.When you press button captioned "clear" then values present in the text field should clear.	CO3	(07)

UNIT – IV

7.	a)	Explain the different types of JDBC Drivers.	CO4	(08)
	b)	What are the three different ways to execute a query when you establish a database connection? Write the syntax of each. Illustrate these statements with an example.	CO4	(07)
	c)	Create a login page to check for valid login id and password using Servlets.	CO4	(05)
8.	a)	With the diagram explain the interaction of JDBC with the databases.	CO4	(08)
	b)	Discuss the life cycle of a Thread.	CO4	(06)
	c)	Write a program to add n numbers where the job is distributed among two threads. Use Runnable interface.	CO4	(06)

UNIT - V

9.	a)	Explain the usage of JSP directives with code snippets.	CO5	(10)
	b)	Write a JSP program to buy a mobile online. Display 10 models of phones and upon selection of a particular phone the page is redirected to checkout. Create an order number and display a success message on purchase or redirect to error page on failure of purchase.	CO5	(10)
10.	a)	Write a Java Bean program to convert a currency amount entered by user in INR to USD.	CO5	(10)
	b)	With a neat diagram explain Stateless Session Bean and Stateful Session Bean.	CO5	(10)

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MAKEUP EXAMINATIONS – MAY/JUNE 2017

Course & Branch	:	B.E : Information Science and Engineering	Semester	:	VI
Subject	:	System Software	Max. Marks	:	100
Subject Code	:	IS631	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1. a) Explain data format, instruction format and addressing modes of SIC/XE machine. CO1 (10)

   b) Design an algorithm for pass 1 of a two pass assembler. CO1 (10)

2. a) Write sequence of instructions for SIC/XE machine to CO1 (08)

   i) Copy 'HELLO WORLD' from location LOC1 to LOC2 using indexing and looping operations.

   ii) Set ALPHA=4*BETA-9+GAMMA, where ALPHA, BETA and GAMMA are work variables. Use immediate addressing for constants

   b) Provide the format for header record, text record and end record with an example for each. CO1 (06)

   c) Explain the data structures used in the design of two pass assembler. CO1 (06)

UNIT - II

3. a) Generate the object code and object program for each of the instruction of the SIC/XE program given below using 2-pass assembler. CO2 (10)

   The opcodes are : STL-14, JSUB-48, LDA-00,JEQ-30, CLEAR-B4, LDT-74

COPY	START	0
FIRST	STL	RETA
	JSUB	RDREC
	LDA	LENG
	JEQ	ENDFIL
ENDFIL	LDA	=C'EOF'
	USE	CDATA
RETA	RESW	1
LENG	RESW	1
	USE	CBLKS
BUFR	RESB	4096
BUFE	EQU	*
MLEN	EQU	BUFR-BUFE
	USE	
RDREC	CLEAR	X
	+LDT	MLEN
	USE	CDATA
INP	BYTE	X'F1'
	LTORG	
	END	

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b) What is the forward reference problem? How is this resolved by assemblers? Illustrate with an example. CO2 (05)

c) Define control section. How does a control section differ from program blocks? CO2 (05)

4. a) Generate the object code for the following SIC/XE program, given that the opcode of LDA-00,LDT-74,LDX-04. And also provide the modification records. CO2 (12)

	PROGA	START	0
		EXTDEF	LA,EA
		EXTREF	LB,EB
0010	R1	LDA	LA
0013	R2	+LDT	LB+4
0017	R3	LDX	#EA-LA
001A	LA	EQU	*
001A	R4	WORD	EA-LA
001D	EA	EQU	*
001D	R5	WORD	EA-LA-(EB-LB)
0020	R6	WORD	LB-LA
		END	R1
	PROGB	CSECT	
		EXTDEF	LB,EB
		EXTREF	LA,EA
0026	R1	+LDA	LA
002A	R2	LDT	LB+4
002D	R3	+LDX	#EA-LA
0030	LB	EQU	*
0030	R4	WORD	EB-LB
0033	EB	EQU	*
0033	R5	WORD	EA-LA-(EB-LB)
0036	R6	WORD	LB-LA
		END	

b) Explain how multi pass assembler handles forward references with an example. CO2 (08)

i) HALFSZ EQU MAXLEN/2
ii) MAXLEN EQU BUFEND-BUFFER
iii) PREVIST EQU BUFFER-1
iv) BUFFER RESB 4096
v) BUFEND EQU *

Assume that when assembler reaches line no.4 location counter contains 1034(HEX)

UNIT - III

5. a) Explain the algorithm for Bootstrap loader for SIC/XE. CO3 (06)

b) Explain the functions of linking loader and linkage editor and highlight he differences. CO3 (06)

b) What is dynamic linking? Describe the process of loading and calling of a subroutine using dynamic linking. CO3 (08)

6. a) For the given object program explain how relocation is achieved using bit masks. Provide the output of the relocation loaders given that the starting address given by the operating system is 3000. CO3 (06)

Input file

H COPY 000000 00107A
T 000000 12 C40 141033 481039 901776 921765 345610 571765
T 001057 0A 800 100036 4C0000 F1 001000
T 001061 19 FE0 040030 E01079 301064 508039 DC1079 2C0036
381064 4C0000 05
E 000000

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b) Write an algorithm of Pass2 of linking loader. CO3 (09)

c) Write a short note on automatic library search. CO3 (05)

UNIT – IV

7. a) Explain any two machine independent macro-processor features. CO4 (10)

b) What is conditional macro expansion? With an example, explain any one statement used for conditional macro expansion. CO4 (05)

c) Describe the variables and data structures used in macro-processor. CO4 (05)

8. a) Explain the following with suitable examples: CO4 (06)

i) Macro definition ii) Macro invocaton iii) Macro expansion.

b) Develop the algorithm for a one-pass macro processor. CO4 (10)

c) Illustrate with an example, the concatenation of macro parameters. CO4 (04)

UNIT - V

9. a) Discuss the following used in lex or YACC programs. CO5 (10)

i. yylex() ii. yywrap() iii. yyparse() iv. yyerror() v. Y.tab.c

b) Explain the ambiguity involved while parsing the input 2+3*4*6. Write a YACC program that will handle ambiguity and evaluate the above expression. CO5 (10)

10. a) Write a lex program to count the number of CO5 (08)

i. + ve and – ve numbers ii. +ve and –ve fractions.

b) Write a YACC program to recognize a valid variable, which starts with a letter, followed by any number of letters or digits. CO5 (08)

c) Indicate the type of inputs accepted by the following regular expressions. CO5 (04)

i) C[1,3]

ii) -?[0-9]+

iii) 0/1

iv) [a-zA-Z]*

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MAKEUP EXAMINATIONS – MAY/JUNE 2017

Course & Branch	:	B.E : Information Science and Engineering	Semester	:	VI
Subject	:	System Software	Max. Marks	:	100
Subject Code	:	IS631	Duration	:	3 Hrs

Instructions to the Candidates:
- Answer one full question from each unit.

UNIT - I

1. a) Explain data format, instruction format and addressing modes of SIC/XE machine. CO1 (10)
   b) Design an algorithm for pass 1 of a two pass assembler. CO1 (10)

2. a) Write sequence of instructions for SIC/XE machine to CO1 (08)
      i) Copy 'HELLO WORLD' from location LOC1 to LOC2 using indexing and looping operations.
      ii) Set ALPHA=4*BETA-9+GAMMA, where ALPHA, BETA and GAMMA are work variables. Use immediate addressing for constants
   b) Provide the format for header record, text record and end record with an example for each. CO1 (06)
   c) Explain the data structures used in the design of two pass assembler. CO1 (06)

UNIT - II

3. a) Generate the object code and object program for each of the instruction of the SIC/XE program given below using 2-pass assembler. CO2 (10)
   The opcodes are : STL-14, JSUB-48, LDA-00,JEQ-30, CLEAR-B4, LDT-74

COPY	START	0
FIRST	STL	RETA
	JSUB	RDREC
	LDA	LENG
	JEQ	ENDFIL
ENDFIL	LDA	=C'EOF'
	USE	CDATA
RETA	RESW	1
LENG	RESW	1
	USE	CBLKS
BUFR	RESB	4096
BUFE	EQU	*
MLEN	EQU	BUFR-BUFE
	USE	
RDREC	CLEAR	X
	+LDT	MLEN
	USE	CDATA
INP	BYTE	X'F1'
	LTORG	
	END	

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b) What is the forward reference problem? How is this resolved by assemblers? Illustrate with an example. CO2 (0

c) Define control section. How does a control section differ from program blocks? CO2 (0

4. a) Generate the object code for the following SIC/XE program, given that the opcode of LDA-00,LDT-74,LDX-04. And also provide the modification records. CO2 (1

	PROGA	START	0
		EXTDEF	LA,EA
		EXTREF	LB,EB
0010	R1	LDA	LA
0013	R2	+LDT	LB+4
0017	R3	LDX	#EA-LA
001A	LA	EQU	*
001A	R4	WORD	EA-LA
001D	EA	EQU	*
001D	R5	WORD	EA-LA-(EB-LB)
0020	R6	WORD	LB-LA
		END	R1
	PROGB	CSECT	
		EXTDEF	LB,EB
		EXTREF	LA,EA
0026	R1	+LDA	LA
002A	R2	LDT	LB+4
002D	R3	+LDX	#EA-LA
0030	LB	EQU	*
0030	R4	WORD	EB-LB
0033	EB	EQU	*
0033	R5	WORD	EA-LA-(EB-LB)
0036	R6	WORD	LB-LA
		END	

b) Explain how multi pass assembler handles forward references with an example. CO2 (08)

i) HALFSZ EQU MAXLEN/2
ii) MAXLEN EQU BUFEND-BUFFER
iii) PREVIST EQU BUFFER-1
iv) BUFFER RESB 4096
v) BUFEND EQU *

Assume that when assembler reaches line no.4 location counter contains 1034(HEX)

UNIT - III

5. a) Explain the algorithm for Bootstrap loader for SIC/XE. CO3 (06)

b) Explain the functions of linking loader and linkage editor and highlight he differences. CO3 (06)

b) What is dynamic linking? Describe the process of loading and calling of a subroutine using dynamic linking. CO3 (08)

6. a) For the given object program explain how relocation is achieved using bit masks. Provide the output of the relocation loaders given that the starting address given by the operating system is 3000. CO3 (06)

Input file

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T 000000 12 C40 141033 481039 901776 921765 345610 571765
T 001057 0A 800 100036 4C0000 F1 001000
T 001061 19 FE0 040030 E01079 301064 508039 DC1079 2C0036
381064 4C0000 05
E 000000

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	b)	Write an algorithm of Pass2 of linking loader.	CO3	(09)
	c)	Write a short note on automatic library search.	CO3	(05)

UNIT – IV

7.	a)	Explain any two machine independent macro-processor features.	CO4	(10)
	b)	What is conditional macro expansion? With an example, explain any one statement used for conditional macro expansion.	CO4	(05)
	c)	Describe the variables and data structures used in macro-processor.	CO4	(05)
8.	a)	Explain the following with suitable examples: i) Macro definition ii) Macro invocaton iii) Macro expansion.	CO4	(06)
	b)	Develop the algorithm for a one-pass macro processor.	CO4	(10)
	c)	Illustrate with an example, the concatenation of macro parameters.	CO4	(04)

UNIT - V

9.	a)	Discuss the following used in lex or YACC programs. i. yylex() ii. yywrap() iii. yyparse() iv. yyerror() v. Y.tab.c	CO5	(10)
	b)	Explain the ambiguity involved while parsing the input 2+3*4*6. Write a YACC program that will handle ambiguity and evaluate the above expression.	CO5	(10)
10.	a)	Write a lex program to count the number of i. + ve and – ve numbers ii. +ve and –ve fractions.	CO5	(08)
	b)	Write a YACC program to recognize a valid variable, which starts with a letter, followed by any number of letters or digits.	CO5	(08)
	c)	Indicate the type of inputs accepted by the following regular expressions. i) C[1,3] ii) -?[0-9]+ iii) 0/1 iv) [a-zA-Z]*	CO5	(04)

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RAMAIAH INSTITUTE OF TECHNOLOGY

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SUPPLEMENTARY SEMESTER EXAMINATIONS – AUGUST 2017

Course & Branch	: B.E : Information Science and Engineering	Semester	: VI
Subject	: System Software	Max. Marks	: 100
Subject Code	: IS631/IS52A3.IS513	Duration	: 3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1. a) Write a SIC program to add the corresponding elements of the two arrays Aarray and Barray and store the result in the elements of Carray. CO1 (06)

   b) Discuss the pass 1 of a two pass SIC assembler. CO1 (06)

   c) Illustrate the role of the following assembler directives: CO1 (08)
   i. RESW ii. RESB iii. BYTE iv. WORD.

2. a) Generate the object code and the symbol table for the following SIC program. Also given below is opcode table. CO1 (10)

```
LDX ZERO
INLOOP   TD INDEV
JEQ INLOOP
RD INDEV
STCH DATA
MOVE   LDCH STR1, X
STCH STR2, X
TIX MOVE

STR1 BYTE C'ABCD'
STR2 RESB 4
ZERO WORD 0
INDEV BYTE X'F1'
DATA RESB 1
```

Instruction	Opcode
LDX	04
LDCH	50
JEQ	30
RD	D8
STCH	54
TIX	2C
TD	E0

   b) Discuss the SIC machine architecture. CO1 (10)

UNIT - II

3. a) With examples explain the role of the 'n', 'i', 'x', 'b' flags in the SIC/XE instructions. CO2 (08)

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b) Generate the object code and the symbol table for the following SIC/XE program using two-pass assemblers. Given below is opcode table. CO2 (1

```
SIC/XE Program
FIRST   CLEAR X
        CLEAR A
        LDCH =X '04'
        RMO A,S
        +LDT #4096
LOOP    TD =X 'F3'
        JEQ LOOP
        RD =X 'F3'
        COMPR A,S
        JEQ EXIT
        STCH BUF,X
        TIXR T
        JLT LOOP
EXIT    STX RECL

USE CDATA
LTORG
RECL RESW 1
BUF RESB 4096
```

Instruction	Opcode
CLEAR	B4
LDCH	50
RMO	AC
LDT	74
TD	E0
JEQ	30
RD	D8
COMPR	A0
STCH	54
TIXR	B8
JLT	38
STX	10

4. a) Obtain the object program for the following SIC/XE code. Given below is the SIC/XE program with address and object code of each of the instructions. CO2 (08)

Address	Instruction	Object code
0000	PROGA START 0 EXTDEF LA,EA EXTREF LB,EB,LC,EC	
0020	REF1 LDA LA	03201D
0023	REF2 +LDT LB+4	77100004
0027	REF3 LDX #EA-LA	050014
0040	LA EQU *	
0054	EA EQU *	
0054	REF4 WORD EA-LA+LC	000014
0057	REF5 WORD EC-LC-10	FFFFF6
005A	REF6 WORD EC-LC+LA-1	00003F
005D	REF7 WORD EA-LA-(EB-LB)	000014
0060	REF8 WORD LB-LA	FFFFC0
	END	

b) Discuss the working of load and go one pass assembler. CO2 (08)

c) Define the terms: CO2 (04)

i. Literals ii. Program blocks iii. Control section iv. Forward Reference

UNIT - III

5. a) Explain the two methods for specifying relocation as a part of object program. CO3 (10)

b) Write the two pass linking loader assembler algorithm. CO3 (10)

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6. a) What is a bootstrap loader? Write an algorithm of bootstrap loader for SIC/XE machine. CO3 (10)

b) Illustrate with an example, the concept of program linking. CO3 (10)

UNIT – IV

7. a) Illustrate with an example and explain the data structures involved in one pass macro processor algorithm. CO4 (07)

b) Write the expanded file for the following code CO4 (07)

```
P8          START   0
MOVE        MACRO   &FROM,&TO
&LENGTH     SET %SIZEOF(&FROM)
IF  (&LENGTH EQ 1)
LDCH &FROM
STCH &TO
ELSE
LDX #&LENGTH
LDS #FROM
LDT #TO
JSUB
ENDIF
MEND
FIRST       MOVE A,B
MOVE C,D
RSUB
A           RESB 1
B           RESB  500
C           RESB  500
D           RESB  500
END
```

(%SIZEOF returns the number of byte occupied by the corresponding argument)

c) Explain the advantage and disadvantage of general purpose macro processor. CO4 (06)

8. a) Using the following definition, expand the following macro invocation statement. CO4 (06)

i. RDBUFF F2, BUF, LENG, (00, 03, 04)

ii. RDBUFF F1, BUF, LENG, (O4, 12)

```
RDBUFF   MACRO   &INDEV,&BADR,&RECL,&EOR
&EORCT  SET %NITEMS(&EOR)
CLEAR X
CLEAR A
+LDT #4096
$LOOP    TD =X'&INDEV'
JEQ $LOOP
&CTR     SET 1
WHILE (&CTR LE &EORCT)
COMP =X'0000&EOR[&CTR]'
JEQ $EXIT
&CTR     SET &CTR+1
ENDW
STCH &BADR, X
TIXR T
JLT $LOOP
$EXIT    STX &RECL
MEND
```


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	b)	What are the independent macro features? Explain any three with an example.	CO4	(06)
	c)	Write a short note on MASM macro processor.	CO4	(08)

UNIT - V

9.	a)	Explain the structure of lex program supported with a typical example.	CO5	(08)
	b)	What do the following notations of regular expression match? Describe with an example. i) . ii) * iii) ^ iv) $ v) {} vi) ?	CO5	(06)
	c)	Write a lex program to recognize following list of verbs. **is, was, do, am, are.**	CO5	(06)
10.	a)	Explain the structure of a YACC program.	CO5	(06)
	b)	Give the LEX and YACC specifications to recognize parenthesized arithmetic expressions.	CO5	(08)
	c)	Write a LEX program to count the number of vowels and consonants in a given string.	CO5	(06)

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M S RAMAIAH INSTITUTE OF TECHNOLOGY

(AUTONOMOUS INSTITUTE, AFFILIATED TO VTU)

BANGALORE – 560 054

MAKE UP EXAMINATIONS- JULY 2014

Course & Branch	: B.E. – INFORMATION SCIENCE & ENGG.	Semester	: VI
Subject	: System Software	Max. Marks	: 100
Subject Code	: IS602	Duration	: 3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1. a) Generate the target address for the object code 022030 of LDA instruction and also indicate the value loaded into register A. Assume (PC)=003000, (3030)=003600, (3600)=103000. (03)

b) Generate the object code for each statement in the following assembly language program. (12)

```
RESULT    START    0
          EXTDEF   T1
          EXTREF   T3,READ
FIRST   + STA      T3
LOOP      LDA      T1
          COMP     #0
        + JSUB     READ
          J        @T2
   T1     RESW     4
   T2     RESB     6

READ      CSECT
          EXTDEF   T3,T4
          EXTREF   T1
          LDA      T3
        + ADD      T1
          STA      T4
        + COMP     #4096
   T3     BYTE     X'05'
   T4     BYTE     C'AB'
          END      FIRST
```

Opcodes

STA:	0C
LDA:	00
COMP:	28
JSUB:	48
J:	3C
ADD:	18

c) Illustrate with an example program relocation concept. (05)

2 a) Suppose that ALPHA is an array of 100 words. Write a sequence of instructions for SIC to set all the 100 elements of the array to 0(zero). (07)

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b) Explain why two passes are required for the assembly process. Write the object program for the following object codes of the SIC program SUM (length is 26 Bytes). (08)

Loc	Object code
1000	141033
1003	482039
1006	001036
1009	281030
100C	301015
100F	482061
1012	3C1003
1015	00102A
1018	0C1039
101B	05
101C	0C1036
101F	482061
1022	08
1023	4C0000

c) Justify the statement, "SIC/XE machine assembler generates the Modification Records only for Format-4 but not for Format-3 instructions". (05)

UNIT – II

3. a) Discuss the working of multi-pass assembler with an example. (07)

b) Develop the source code of boot-strap loader. (06)

c) The following program uses the linking and relocation concept. Write the modification records for the instructions wherever it is needed. (07)

Loc		Source Statements		Object code
0000	PROGA	START 0		
		EXTDEF	LISTA, ENDA	
		EXTREF	LISTB, ENDB, LISTC, ENDC	
		.		
		.		
0020	REF1	LDA	LISTA	03201D
0023	REF2	+LDT	LISTB+4	77100004
0027	REF3	LDX	#ENDA-LISTA	050014
		.		
		.		
0040	LISTA	EQU	*	
0054	ENDA	EQU	*	
0057	REF5	WORD	ENDC-LISTC-10	FFFFF6
.				
005D	REF7	WORD	ENDA-LISTA-(ENDB-LISTB)	000014
0060	REF8	WORD	LISTB-LISTA	FFFFC0
		END REF1		

4. a) Discuss why the bit-mask method of specifying program relocation is efficient than the modification record method for the SIC program. Write the bit-mask for the following object code of SIC program. (06)

Loc	Source Statements			Object code
0015	ENDFIL	LDA	EOF	00002A
0018		STA	THREE	0C0039
001B		LDL	ZERO	080033
001E	EOF	BYTE	C'EOF'	454F46
0021	THREE	WORD	3	000003
0024	ZERO	WORD	0	000000
		END		

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b) Design an algorithm for pass-1 of two-pass linking loader. (06)

c) Illustrate how the loading and calling of a subroutine will be done using dynamic linking. (08)

UNIT – III

5. a) Describe the structure of Lex program. (06)

b) Develop a lex program to count the number of vowels and consonants in a given string. (06)

c) Write a yacc program to which accepts the following language- (08)
$L=\{WW^R \mid \text{such that } W \in \{a, b\}^*, W^R \text{ is reverse of } W\}$.

6. a) Design Lex specifications for the following- (06)
i) Number starting with an even number and ending with an odd number.
ii) Valid identifier.
iii) Number whose 3rd digit from the right end is 2.

b) What is ambiguous grammar? Give an example. Discuss how the ambiguity can be resolved in arithmetic expression evaluation. (07)

c) Write a Yacc program to accept the strings of kind $a^n b^n$, where n>=1. (07)

UNIT – IV

7. a) Design an algorithm for a one-pass macroprocessor. (10)

b) The following is the macro definition of RDBUFF macro. Expand the macro call: RDBUFF F2, BUFFER, LENGTH, (00,03,04). (06)

```
RDBUFF     MACRO     &INDEV, &BUFADR,&RECLTH,&EOR
&EORCT     SET       %NITEMS(&EOR)
           CLEAR     X
           CLEAR     A
          +LDT       #4096
 $LOOP     TD        =X'&INDEV'
           JEQ       $LOOP
           RD        =X'&INDEV'
&CTR       SET       1
           WHILE (&CTR LE &EORCT)
           COMP      =X'0000&EOR[&CTR]'
           JEQ       $EXIT
&CTR       SET       &CTR+1
           ENDW
           STCH      &BUFADR,X
           TIXR      T
           JLT       $LOOP
$EXIT      STX       &RECLTH
           MEND
```

c) List any four advantages of the general purpose macroprocessors. (04)

8. a) What happens if we don't prefix the symbol $ to the label name in the macro definition? Explain with an example. (06)

b) The following is the macro definition of RDBUFF macro. Expand the macro call: RDBUFF F3, BUF, RECL, 04, 2048. (06)

```
RDBUFF     MACRO  &INDEV, &BUFADR, &RECLTH, &EOR, &MAXLTH
               IF   (&EOR NE ' ')
&EORCHK        SET  1
               ENDIF
               CLEAR X
               CLEAR A
               IF (&EORCHK EQ 1)
               LDCH  =X'&EOR'
               RMO A,S
               ENDIF
```


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```
IF (&MAXLTH  EQ ' ')
+LDT #4096
ELSE
+LDT #&MAXLTH
ENDIF
$LOOP TD =X'&INDEV'
JEQ   $LOOP
RD =X'&INDEV'
IF (&EORCHK  EQ 1)
COMPR A,S
JEQ $EXIT
ENDIF
STCH &BUFADR , X
TIXR T
JLT $LOOP
$EXIT STX $RECLTH
MEND
```

c) Illustrate with an example the purpose of using the symbol → in the concatenation of macroprameter feature. Discuss with an example the advantage of keyword macroparameters. (08)

UNIT – V

9. a) Discuss with the neat sketches the interpreter and compiler-to-compiler. (10)

b) Generate the optimized code for the following, by eliminating common sub expressions. (10)

```
X,Y : ARRAY[1..10,1..10] OF INTEGER
FOR I;=1 TO 10 DO
  X[I,2*J-1]:= Y[I,2*J]
```

10. a) What is recursive-decent parser? Write the recursive-decent parser routine for a READ statement of Pascal language. The grammar is: (10)

<read>::= READ (<id-list>)

<id-list>::= id {, id }

b) Explain how a compiler deals with the block structured languages. (10)

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SEMESTER END EXAMINATIONS – MAY/JUNE 2017

Course & Branch	: B.E : Information Science and Engineering	Semester	: VI
Subject	: System Software	Max. Marks	: 100
Subject Code	: IS631	Duration	: 3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1. a) Illustrate with an example the instruction formats and data formats of SIC /XE Machine. CO1 (06)

b) Generate the Object code for SIC machine CO1 (07)

```
WRREC   START   105D
        LDA     LENGTH
WLOOP   TD      OUTPUT
        JEQ     WLOOP
        LDCH    BUFFER, X
        WD      OUTPUT
        JLT     WLOOP
        RSUB
OUTPUT  BYTE    X '05'
BUFFER  RESB    400
LENGTH  RESB    2
        END     WRREC
```

Instruction	opcode
LDA	00
TD	E0
JEQ	30
LDCH	50
WD	3C
JLT	38
RSUB	4C

c) i) Write a SIC/XE program to read value of X and Y from memory and evaluate the expression Z=X*4+ Y*3 CO1 (07)

ii) Explain the use of SVC and TD instruction in SIC/XE?

2. a) Develop an assembly language program in SIC/XE machine to add the contents of 2 arrays, **IntArr1** and **IntArr2**, and store the added result in **ResArr**. CO1 (06)

b) Generate the Object code for SIC machine. CO1 (07)

SUM	START	4000
FIRST	LDX	ZERO
	LDA	ZERO
	LDCH	CHARZ
LOOP	ADD	TABLE,X
	TIX	COUNT
	JLT	LOOP
	STA	TOTAL
	RSUB	
CHARZ	BYTE	C'ABC'
TABLE	RESW	2000
COUNT	RESW	1
ZERO	WORD	0
TOTAL	RESW	1
	END	

Instruction	Opcode
LDX	04
LDA	00
LDCH	50
ADD	18
TIX	2C
JLT	38
STA	0C
RSUB	4C

c) What are assembler directives? Describe any five assembler directives used in SIC/XE instructions. CO1 (07)

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UNIT - II

3. a) Generate the object code for each statement in the following program: Opcodes:LDX-04;LDA-00;LDB-68;ADD-18;TIX-2C;JLT-38;STA-0C;RSUB-4C CO2 (04)

```
SUM     START   0
FIRST   LDX     #0
        LDA     #0
        +LDB    #TABLE2
        BASE    TABLE2
LOOP    ADD     TABLE, X
        ADD     TABLE2,X
        TIX     COUNT
        JLT     LOOP
        +STA    TOTAL
        RSUB
COUNT   RESW    1
TABLE   RESW    2000
TABLE2  RESB    2000
TOTAL   RESW    1
        END     SUM
```

b) Provide the format of the modification record. With suitable illustrations indicate why modification records are generated only for Format 4 instructions. CO2 (04)

c) Describe the working of Load and go assembler. CO2 (08)

4. a) Generate the symbol table and the object code(each statement) for the following assembly language program- CO2 (08)

OPcodes:

CLEAR: B4, STL: 14, LDB: 68, JSUB: 48, LDA: 00, STA: 0C, J: 3C

```
SUM     START   0
FIRST   CLEAR   S
        LDB     #5
        +JSUB   RESULT
        STA     LOC,X
        J       @NUM
NUM     RESW    1
TEMP    WORD    20
LOC     BYTE    X'12'
RESULT  RESB    2
        END     SUM
```

b) Referring to the following program that uses control section (CSECT) assembler directive, provide different records of object code and program for subroutine 'COPY'. Given STL-14, CLEAR-B4,JSUB-48. CO2 (08)

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```
Location   Source Statement                                   Object Code
0000       COPY    START    0
                   EXTDEF   BUFFER, BUFEND
0000               EXTREF   RDREC
0003       FIRST   STL      RETADR
           CLOOP   +JSUB    RDREC
.                  .
.                  .
.                  .
002A       RETADR  RESW     1
.                  .
.                  .
.                  .
0033       BUFFER  RESW     4096
1033       BUFEND  EQU      *
1033       MAXLEN  WORD     BUFEND-BUFFER
           .       Subroutine to Read Record into Buffer
0000       RDREC   CSECT
                   EXTREF   BUFFER, BUFEND
0000               CLEAR    X
0002       MAXLEN  EQU      BUFEND-BUFFER
```

c) State the differences between literals and immediate operands. CO2 (04)

UNIT - III

5. a) Provide the algorithm for a linking loader. Discuss the data structures used. CO3 (10)

b) For the given object program explain how relocation is achieved using bit masks. Provide the output of the relocation loaders given that the starting address given by the operating system is 3000. CO3 (05)

Input File:

H COPY 000000 00

T 000000 12 C40 141033 481039 901776 921765 345610 571765

T 002011 0F E00 232838 432979 892060 662849 340000

E 000000

c) With a flowchart discuss the processing of an object program using linkage editors. CO3 (05)

6. a) Provide and describe the source code of the bootstrap loader for SIC/XE. CO3 (10)

b) What is dynamic linking? Describe the process of loading and calling of a subroutine using dynamic linking. CO3 (10)

UNIT – IV

7. a) Expand the following macro invocation statements using the given macro definition- CO4 (06)

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Function f2,Q,(10,20,30) followed by
Function f1,R, 40

Macro definition

```
Function   MACRO   &I, &Len, &List
&C1        SET     %NITEMS(&List)
+LDT       #4096
$Loop      TD      =X'&I'
JEQ        $Loop
RD         =X'&I'
&C2        SET     1
WHILE ( &C2  LE  &C1)
COMP       =X'0000&List[&C2]'
JEQ        $Exit
&C2        SET     &C2+1
ENDW
TIXR       T
JLT        $Loop
&Exit      STX     &Len
MEND
```

b) Illustrate the concept of recursive macro expansion. CO4 (05)

c) Write the one-pass macroprocessor algorithm. CO4 (09)

8. a) Write a note on General purpose macro processors. CO4 (06)

b) Elaborate on the various data structures required by the macro processor. For the given macro and the macro call (RDB F3, BUFF, LEN) discuss about the data stored in these data structures. CO4 (08)

```
RDB   MACRO &IN, &BU, &REC
CLEAR X
CLEAR A
+LDT #4096
TD =X'&IN'
JEQ *-3
RD =X'&IN'
COMPR A,S
JEQ *+11
STCH &BU,X
TIXR T
JLT *-19
STX &REC
MEND
```

c) Discuss the features of the MASM macroprocessors. CO4 (06)

UNIT - V

9. a) Discuss the following with respect to Lex and Yacc.
i) yywrap() ii) yylex() iii) yyerror() CO5 (06)

b) Write a Yacc program to recognize the given arithmetic expression having =,-,*, / and unary operators. CO5 (07)

c) What is regular expression? Explain any 5 characters that form regular expression CO5 (07)

10 a) With an example explain the structure of YACC program. CO5 (06)

b) Describe shift/reduce parsing with an example. CO5 (07)

c) Write a Lex program to count the number of characters, words and lines in a given input file. CO5 (07)

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SEMESTER END EXAMINATIONS – MAY/JUNE 2017

Course & Branch	:	B.E : Information Science and Engineering	Semester	:	VI
Subject	:	Distributed Storage Technologies	Max. Marks	:	100
Subject Code	:	IS62B2	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1. a) Define the term Data Center and briefly discuss the core elements of a data center. CO1 (10)

   b) Consider a disk I/O system in which an I/O request arrives at the rate of 80 IOPS. CO1 (10)
   The disk service time is 6 ms.
   i. Compute the following: Utilization of I/O controller, Total response time, Average queue size, and Total time spent by a request in a queue.
   ii. Compute the preceding parameter if the service time is halved.

2. a) Give the comparison of Server-centric Storage Architecture and Information-centric Storage Architecture. CO1 (10)

   b) The average I/O size of an application is 64 KB. The following specifications are available from the disk manufacturer: average seek time = 5 ms, 7,200 rpm, transfer rate = 40 MB/s. Determine the maximum IOPS that could be performed with the disk for this application. Taking this case as an example, explain the relationship between disk utilization and IOPS. CO1 (10)

UNIT - II

3. a) Explain different types of implementing Intelligent Storage Systems. CO2 (10)

   b) An application has 1,000 heavy users at a peak of 2 IOPS each and 2,000 typical users at a peak of 1 IOPS each, with a read/write ratio of 2: 1. It is estimated that the application also experiences an overhead of 20 percent for other workloads. Compute the number of drives required to support the application in RAID 1 and 6 environments if 10K rpm drives with a rating of 130 IOPS per drive were used. CO2 (10)

4. a) Enumerate different cache management and cache data protection policies incorporated in intelligent storage system. CO2 (10)

   b) Explain the working principle of RAID 5 and further illustrate the process of data recovery in case of any disk failure in RAID 5. CO2 (10)

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UNIT - III

5.	a)	What is zoning? Discuss a scenario. (i) Where soft zoning is preferred over hard zoning. (ii) Where hard zoning is preferred over soft zoning.	CO3	(10)
	b)	Explain different Fiber channel interconnectivity options.	CO3	(10)
6.	a)	Illustrate the process of assigning FC address to a node when logging in to the network for the first time.	CO3	(10)
	b)	Briefly explain how the priority sequence is established in a wide SCSI environment.	CO3	(10)

UNIT – IV

7.	a)	Enumerate the working of I/O operation in Network Attached Storage (NAS) and list the benefits of NAS.	CO4	(10)
	b)	What are the components of unified storage and explain the process of accessing data from unified storage.	CO4	(10)
8.	a)	List and briefly discuss different factors affecting the performance of NAS.	CO4	(10)
	b)	Illustrate the process of storing and retrieving objects from Object-based Storage Device.	CO4	(10)

UNIT - V

9.	a)	Explain the various business/technical considerations for implementing a backup solution and how do these considerations impact the backup solution/ implementation?	CO5	(10)
	b)	Briefly discuss different activities of Storage Infrastructure Management.	CO5	(10)
10.	a)	Illustrate the implementation of fault tolerance model to mitigate a single point failure with an example.	CO5	(10)
	b)	Explain different stages in Business Continuity planning lifecycle.	CO5	(10)

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SEMESTER END EXAMINATIONS – MAY/JUNE 2017

Course & Branch	:	B.E : Information Science and Engineering	Semester	:	VI
Subject	:	Distributed Storage Technologies	Max. Marks	:	100
Subject Code	:	IS62B2	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

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   The disk service time is 6 ms.
   i. Compute the following: Utilization of I/O controller, Total response time, Average queue size, and Total time spent by a request in a queue.
   ii. Compute the preceding parameter if the service time is halved.

2. a) Give the comparison of Server-centric Storage Architecture and Information-centric Storage Architecture. CO1 (10)

   b) The average I/O size of an application is 64 KB. The following specifications are available from the disk manufacturer: average seek time = 5 ms, 7,200 rpm, transfer rate = 40 MB/s. Determine the maximum IOPS that could be performed with the disk for this application. Taking this case as an example, explain the relationship between disk utilization and IOPS. CO1 (10)

UNIT - II

3. a) Explain different types of implementing Intelligent Storage Systems. CO2 (10)

   b) An application has 1,000 heavy users at a peak of 2 IOPS each and 2,000 typical users at a peak of 1 IOPS each, with a read/write ratio of 2: 1. It is estimated that the application also experiences an overhead of 20 percent for other workloads. Compute the number of drives required to support the application in RAID 1 and 6 environments if 10K rpm drives with a rating of 130 IOPS per drive were used. CO2 (10)

4. a) Enumerate different cache management and cache data protection policies incorporated in intelligent storage system. CO2 (10)

   b) Explain the working principle of RAID 5 and further illustrate the process of data recovery in case of any disk failure in RAID 5. CO2 (10)

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UNIT - III

5.	a)	What is zoning? Discuss a scenario. (i) Where soft zoning is preferred over hard zoning. (ii) Where hard zoning is preferred over soft zoning.	CO3	(10)
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6.	a)	Illustrate the process of assigning FC address to a node when logging in to the network for the first time.	CO3	(10)
	b)	Briefly explain how the priority sequence is established in a wide SCSI environment.	CO3	(10)

UNIT – IV

7.	a)	Enumerate the working of I/O operation in Network Attached Storage (NAS) and list the benefits of NAS.	CO4	(10)
	b)	What are the components of unified storage and explain the process of accessing data from unified storage.	CO4	(10)
8.	a)	List and briefly discuss different factors affecting the performance of NAS.	CO4	(10)
	b)	Illustrate the process of storing and retrieving objects from Object-based Storage Device.	CO4	(10)

UNIT - V

9.	a)	Explain the various business/technical considerations for implementing a backup solution and how do these considerations impact the backup solution/ implementation?	CO5	(10)
	b)	Briefly discuss different activities of Storage Infrastructure Management.	CO5	(10)
10.	a)	Illustrate the implementation of fault tolerance model to mitigate a single point failure with an example.	CO5	(10)
	b)	Explain different stages in Business Continuity planning lifecycle.	CO5	(10)

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MAKE UP EXAMINATIONS – JULY 2014

Course & Branch	:	B.E. – INFORMATION SCIENCE & ENGG.	Semester	:	VI
Subject	:	Information Storage and Management	Max. Marks	:	100
Subject Code	:	IS6E22	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1. a) With the block diagram of an example system, briefly explain the five core elements of a data center. (07)

   b) The average I/O size of an application is 32 KB. The following specifications are available from the disk manufacturer: average seek time = 5 ms, 10000 rpm, transfer rate of 40 MB/s. Determine the maximum IOPS that could be performed with the disk for this application. (08)

   c) Discuss the command queuing methods implemented to improve disk performance. (05)

2. a) Distinguish with diagrams Server-Centric Storage Architecture and Information-Centric Storage Architecture. (08)

   b) Discuss with diagrams Compute Virtualization and its advantages. (08)

   c) Describe briefly the architecture and key components of an EFD. (04)

UNIT – II

3. a) Discuss the write penalty implication in the case of RAID 5 with the help of an example. Justify the write penalty implication in the case of RAID 6. (08)

   b) What is cache watermarking? Discuss the different flushing modes. (08)

   c) What is LUN Masking? What is the use of LUN Masking? (04)

4. a) Discuss the RAID 0+1 and RAID 1+0 storage technologies with suitable diagrams. (10)

   b) Discuss the two categories of ISS implementations. (10)

UNIT – III

5. a) Discuss briefly the different types of FC ports and their role with a sample configuration diagram. (10)

   b) Identify reasons in developing the FCoE protocol. Illustrate with the help of diagrams how I/O consolidation is achieved with FCoE. (10)

6. a) Describe the FC addressing scheme and the WWN naming scheme with their formats. (10)

   b) Give the structure of the iSCSI PDU and explain. Why it may be required to change the MTU size of the IP packet? (10)

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UNIT – IV

7. a) What is NAS? What are its benefits? (10)
   b) Distinguish with the help of a diagram Block-level access and Object-level access. (10)

8. a) Compare with the help of diagrams Unified and Gateway NAS implementations. (10)
   b) Describe Unified Storage with a diagram. (10)

UNIT – V

9. a) Describe the consequences of downtime in a business. How can its impact be calculated? (10)
   b) Discuss the parameters that are monitored in a storage infrastructure. (10)

10. a) Describe briefly with diagrams public and private cloud deployment models. (10)
    b) Discuss threats and the strategies for security in the three storage security domains. (10)

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SUPPLEMENTARY SEMESTER EXAMINATIONS-JULY/AUGUST 2014

Course & Branch	: B.E. – INFORMATION SCIENCE & ENGG.	Semester	: VI
Subject	: System Software	Max. Marks	: 100
Subject Code	: IS602	Duration	: 3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1. a) Discuss the different instruction formats and different types of addressing modes in SIC/XE architecture with examples. (08)

b) Generate the Object code for SIC machine (06)

```
WRREC   START   105D
        CLEAR   X
        LDT     LENGTH
WLOOP   TD      OUTPUT
        JEQ     WLOOP
        LDCH    BUFFER, X
        WD      OUTPUT
        TIXR    T
        JLT     WLOOP
        RSUB
OUTPUT  BYTE    X '05'
BUFFER  RESB    400
LENGTH  RESB    2
        END     WRREC
```

CLEAR = B4 LDT = 74
TD = EO JEQ = 30
TIXR =B8 JLT =38
RSUB= 4C LDCH = 50
WD = DC X = 1 T = 5

c) i)Explain the use of SVC and TD instruction in SIC/XE? (06)

ii) What are the similarities and the differences (if has) between the following A, B, and C sequences of statements?

```
A.      Value   EQU   10
                ...
                LDA   #Value
B.              LDA   #10
C.      Value   EQU   10
                ...
                LDA   Value
```


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2 a) Generate the LOC and object code for each statement in the following SIC/XE source program. (08)

```
SUM     START   0
FIRST   LDX     #0
LOOP    LDA     #100
        +LDB    #TABLE2
        BASE    TABLE2
        ADD     TABLE1,X
        ADD     TABLE2,X
        TIX     CONT
        JLT     LOOP
        +STA    TOTAL
        RSUB
CONT    BYTE    C'ZOO'
TABLE1  RESW    2000
TABLE2  RESW    1000
TOTAL   RESW    1
        END     FIRST
```

ADD 18H
LDA 00H
LDX 04H
STA 0CH
The ASCII of A is 41H
JLT 38H
LDB 68H
RSUB 4CH
TIX 2CH

b) Write the general descriptions of the functions of the two pass simple assembler. (06)

c) i) Write a SIC/XE program to transfer two hundred bytes of data from input device to memory. (06)
ii) Write a SIC/XE program to read value of X and Y from memory and evaluate the expression Z=X*4+ Y*3

UNIT II

3. a) Explain how multi pass assembler handles forward references with an example. (05)

```
1   HALFSZ EQU MAXLEN/2
2   MAXLEN EQU BUFEND-BUFFER
3   PREVIST EQU BUFFER-1
4   BUFFER RESB 4096
5   BUFEND EQU *
```

Assume that when assembler reaches line no.4 location counter contains 1034(HEX)

b) Explain the algorithm for Bootstrap loader. (06)

c) What is dynamic loading? What are its advantages? Explain with a neat diagram loading and calling of a subroutine using dynamic linking. (09)

4. a) Define control section. How does a control section differ from program blocks? Explain with an example. (08)

b) Illustrate with an example how forward references are handled in one pass assembler. (05)

c) Design an algorithm for the pass2 of linking loader. (07)

UNIT – III

5. a) Write a Yacc program to recognize the given arithmetic expression having =,-,*, / and unary operators. (07)

b) What are ambiguous grammars? Explain with an example. (06)

c) Describe shift/reduce parsing with an example. (07)

6 a) What is regular expression? Explain any 5 characters that form regular expression. (06)

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b) Write a Lex program to count the number of characters, words and lines in a given input file. (07)

c) What are Yacc tools? What are the two types of conflicts that arises during parsing? (07)

UNIT – IV

7. a) Using the following definition, expand the following macro invocation statement. (07)

i. RDBUFF F2, BUFFER, LENGTH, (00, 03, 04)

ii. RDBUFF F1, BUFFER, LENGTH, (O4, 12)

```
RDBUFF   MACRO   &INDEV,&BUFADR,&RECLTH,&EOR%
&EORCT   SET %NITEMS(&EOR)
CLEAR X
CLEAR A
+LDT #4096
$LOOP    TD =X'&INDEV'
JEQ $LOOP
&CTR     SET 1
WHILE (&CTR LE &EORCT)
COMP =X'0000&EOR[&CTR]'
JEQ $EXIT
&CTR     SET &CTR+1
ENDW
STCH &BUFADR, X
TIXR T
JLT $LOOP
$EXIT    STX &RECLTH
MEND
```

b) What are the independent macro features? Explain any three with an example. (07)

c) Explain the advantage and disadvantage of general purpose macro processor. (06)

8. a) Write the expanded file for the following code (07)

```
P8          START   0
MOVE        MACRO   &FROM,&TO
&LENGTH     SET %SIZEOF(&FROM)
IF  (&LENGTH EQ 1)
LDCH &FROM
STCH &TO
ELSE
LDX #&LENGTH
LDS #FROM
LDT #TO
JSUB
ENDIF
MEND
FIRST       MOVE A,B
MOVE C,D
RSUB
A           RESB 1
B           RESB 500
C           RESB 500
D           RESB 500
END
```

(%SIZEOF returns the number of byte occupied by the corresponding argument)

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b) Illustrate with an example and explain the data structures involved in one pass macro processor algorithm. (08)

c) Write a short note on MASM macro processor. (05)

UNIT – V

9. a) Discuss the operator-Precedence parsing and Recursive decent parsing techniques with an example. (10)

b) Discuss the following (10)

i)Interpreters ii) Compiler-to Compiler

10. a) What are the advantages of code optimization? Explain the different source of code optimization. (10)

b) Illustrate with an example, explain how a compiler deals with the block structures languages (10)

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IS61B1/IS6E22

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M S RAMAIAH INSTITUTE OF TECHNOLOGY

(AUTONOMOUS INSTITUTE, AFFILIATED TO VTU)

BANGALORE – 560 054

MAKE UP EXAMINATIONS – JULY 2015

Course & Branch	:	B.E.- Information Science & Engg.	Semester	:	VI
Subject	:	Information Storage and Management	Max. Marks	:	100
Subject Code	:	IS61B1 / IS6E22	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1. a) Discuss the essential expectations from a data centers? Describe the core elements of a data center and examine steps in managing a data center? (10)

   b) Analyze factors essential for disk performance for an application? Discuss ways to improve response time for an application (10)

2 a) Compare the characteristics of enterprise flash drives with reference to magnetic hard drives and also explain multilevel cell storage and write leveling in flash drives? (10)

   b) Calculate the no of disks required for an application given that the application requires 1800 IOPS and storage of 3.5Tbytes. Physical disk that is available is of 140 IOPS and storage capacity of 150 GB? Explain disk service time? (10)

UNIT – II

3. a) Elaborate on the important differences between different RAID levels and how they affect the performance and redundancy? List the applications for each of the RAID levels? (10)

   b) With a neat diagram explain the components of intelligent storage systems? Explain mapping of cache and physical storage? (10)

4. a) Enumerate different are Techniques employed by RAID for improving performance and fault tolerance? Elaborate which particular raid technique is widely used in a data center? Why? (10)

   b) What is LUN Masking and meta LUN? explain types of Storage provisioning (10)

UNIT – III

5. a) Explain the fiber channel protocol stack different layers and their functions? What are the different topologies in which fiber channel can be adopted? (10)

   b) Enumerate the advantages of fiber channel over optical fiber over copper cables? Analyze the different login types and the types of ports available on a fiber channel switch? (10)

6. a) Elaborate the reasons for using ip storage? Explain the different variants of IP storage and their differences? Also reason out the draw backs IP storage? (10)

   b) Examine with a neat diagram the parts of the FC frame used in fiber channel ? (10)

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UNIT – IV

7. a) Enumerate the different components of NAS? List the factors affecting NAS Performance and causes for latency? (10)

   b) With a neat diagram explain the different components of OSD? and also explain content addressed storage its features ? (10)

8. a) With a neat diagram elaborate steps in object storage and retrievals in OSD? (10)

   b) Explain NAS scale out and scale out NAS connectivity? Also examine file sharing protocols used by NAS. (10)

UNIT – V

9. a) Explain various metrics and terms used for information availability? What are the causes for data non availability? (10)

   b) Analyze business continuity planning life cycle and key activities and elaborate business continuity solutions? (10)

10. a) What are the challenges in storage infrastructure management? and explain ILM? (10)

    b) What is storage tiearing explain with a neat diagram? Variants to storage tiearing? Cache tiearing ? (10)

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M S RAMAIAH INSTITUTE OF TECHNOLOGY

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BANGALORE – 560 054

SEMESTER END EXAMINATIONS – MAY/JUNE 2016

Course & Branch	: B.E. – Information Science & Engg.	Semester	: VI
Subject	: Distributed Storage	Max. Marks	: 100
Subject Code	: IS62B2	Duration	: 3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1.	a)	Briefly explain technological evolution of storage architectures.	CO1	(10)
	b)	Explain the fundamental laws that governs the disk performance.	CO1	(10)
2.	a)	Give the relationship between utilization of I/O controller and response time by taking a suitable example.	CO1	(10)
	b)	Consider an example of a SCSI controller with a throughput of 160 MB/s and disk service time of 0.3ms. Calculate the rate at which I/Os are serviced in a typical database I/O with block sizes of 4KB, 8KB, 16KB, 32KB and 64KB.	CO1	(10)

UNIT – II

3.	a)	Give the comparison of RAID 0,1,2,3,4 and 5 with respect to storage efficiency, read and write performance and justify the same.	CO2	(10)
	b)	Explain the process of flushing in cache management of intelligent storage system.	CO2	(10)
4.	a)	Explain different components of RAID array and discuss different modes of implementing RAID.	CO2	(10)
	b)	With the help of diagram explain different components of an intelligent storage system.	CO2	(10)

UNIT – III

5.	a)	Discuss briefly with a diagram the function of the different layers of the FC Protocol Stack.	CO3	(10)
	b)	Identify reasons in developing the FCoE protocol. Illustrate with the help of diagrams how I/O consolidation is achieved with FCoE.	CO3	(10)
6.	a)	Discuss Block-level storage virtualization with a diagram. Identify its advantages.	CO3	(10)
	b)	Give the structure of the iSCSI PDU and explain. Why it may be required to change the MTU size of the IP packet?	CO3	(10)

UNIT – IV

7.	a)	Illustrate different types of NAS implementations connectivity.	CO4	(10)
	b)	Briefly discuss the advantages and disadvantages of using content addressed storage.	CO4	(10)
8.	a)	Give the comparison of NAS device before and after file level virtualisation.	CO4	(10)
	b)	Enumerate implementation of different NAS file-sharing protocols.	CO4	(10)

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UNIT – V

9.	a)	Describe the Business Continuity Planning Lifecycle.	CO5	(10)
	b)	Discuss with example diagrams the issue of Single Point of Failure and the Fault Tolerant Solution to mitigate it.	CO5	(10)
10.	a)	Discuss the types of software and their role in the management and creation of cloud services.	CO5	(06)
	b)	Discuss the parameters that are monitored in a storage infrastructure.	CO5	(06)
	c)	Discuss with diagrams Intra-array and Inter-array storage tiering.	CO5	(08)

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(Autonomous Institute, Affiliated to VTU)
Bangalore – 560 054

MAKEUP EXAMINATIONS – MARCH 2017

Course & Branch	: B.E.-Information Science & Engineering	Semester	: VII
Subject	: Software Design Patterns	Max. Marks	: 100
Subject Code	: IS713	Duration	: 3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT - I

1.	a)	What are the problems of requirements and reasons for the changing requirements?	CO1	(08)
	b)	Design the Library Management System using UML class diagrams.	CO1	(08)
	c)	Differentiate between aggregation and composition with an example	CO1	(04)
2.	a)	Describes martin fowler three different perspectives in the software development process	CO1	(06)
	b)	What are the essential challenges of functional decomposition?	CO1	(08)
	c)	Do we really spend much time in fixing bugs? Justify your answer	CO1	(06)

UNIT – II

3.	a)	Define Strategy pattern. Give three general scenarios where the Strategy patterns are used.	CO2	(07)
	b)	Why do you think the Gang of Four call this pattern "Bridge"? Is it an appropriate name for what it is doing? Why or why not?	CO2	(07)
	c)	How Bridge pattern can be used in the design of a visual text editor with menus and scroll bar.	CO2	(06)
4.	a)	Explain the Bridge pattern with its key features and sample code.	CO2	(07)
	b)	With sample codes explain when it is more appropriate to use the façade pattern rather than the adapter pattern.	CO2	(07)
	c)	Give some general scenarios where the Adapter patterns are used.	CO2	(06)

UNIT - III

5.	a)	What are the five possible errors in using design patterns? Discuss	CO3	(10)
	b)	Explain strategy patterns with key features and an example	CO3	(10)
6.	a)	Explain commonality and variability analysis with an example	CO3	(10)
	b)	Explain Abstract Factory Pattern with key features and design a computer system to display and print shapes from a database.	CO3	(10)

UNIT - IV

7.	a)	Briefly explain the issues that are to be considered while implementing the Singleton Pattern.	CO4	(07)
	b)	Briefly explain the key features of a template method pattern.	CO4	(07)
	c)	Factories help in testing. In what ways is this true? Explain.	CO4	(06)

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8. a) What is Observer pattern? Explain the key features of observer pattern with suitable example. CO4 (10)

b) What is Factory method pattern? How does the factory method pattern fit in with other factories? Explain with the help of a suitable example. CO4 (10)

UNIT - V

9. a) Explain three design levels of Software. Write the model of Engineering Discipline Evolution. CO5 (10)

b) With neat diagrams, explain the following architectural styles: CO5 (10)

i. Repositories

ii. Interpreters.

10. a) Design KWIC problem using any two architectural styles. CO5 (10)

b) Design Cruise Control from process control view of the system. CO5 (10)

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MAKEUP EXAMINATIONS – MARCH 2017

Course & Branch	:	B.E.-Information Science & Engineering	Semester	:	VII
Subject	:	Software Design Patterns	Max. Marks	:	100
Subject Code	:	IS713	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

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	b)	Design the Library Management System using UML class diagrams.	CO1	(08)
	c)	Differentiate between aggregation and composition with an example	CO1	(04)
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	b)	What are the essential challenges of functional decomposition?	CO1	(08)
	c)	Do we really spend much time in fixing bugs? Justify your answer	CO1	(06)

UNIT – II

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	c)	How Bridge pattern can be used in the design of a visual text editor with menus and scroll bar.	CO2	(06)
4.	a)	Explain the Bridge pattern with its key features and sample code.	CO2	(07)
	b)	With sample codes explain when it is more appropriate to use the façade pattern rather than the adapter pattern.	CO2	(07)
	c)	Give some general scenarios where the Adapter patterns are used.	CO2	(06)

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	b)	Briefly explain the key features of a template method pattern.	CO4	(07)
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UNIT - V

9.	a)	Explain three design levels of Software. Write the model of Engineering Discipline Evolution.	CO5	(10)
	b)	With neat diagrams, explain the following architectural styles: i. Repositories ii. Interpreters.	CO5	(10)
10.	a)	Design KWIC problem using any two architectural styles.	CO5	(10)
	b)	Design Cruise Control from process control view of the system.	CO5	(10)

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Bangalore – 560 054

SUPPLEMENTARY SEMESTER EXAMINATIONS – JULY 2017

Course & Branch	:	B.E.-Information Science & Engineering	Semester	:	VII
Subject	:	Software Design Patterns	Max. Marks	:	100
Subject Code	:	IS713	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1.	a)	What is meant by software design? Explain briefly the characteristics of a good design.	CO1	(07)
	b)	"Encapsulation is simply about making the fields of a class private." Discuss in favor or against this statement. Provide enough details to support your discussion.	CO1	(07)
	c)	What are the problems of requirements and how does functional decomposition deal with them?	CO1	(06)
2.	a)	What are the three fundamental reasons to use UML? Describe different types of relations with neat diagrams.	CO1	(07)
	b)	"Inheritance is essential for the existence of Polymorphism." Discuss either in support or against this statement.	CO1	(07)
	c)	What is meant by software modularization? List the various advantages of modularization.	CO1	(06)

UNIT - II

3.	a)	What are the advantages of learning design patterns?	CO2	(10)
	b)	Design a controller program for a state of the art home theatre system (HTS) so that movie watching is a pleasant experience. The HTS comprises of BRD Player, Tuner, Amplifier, Screen, lighting system and even a pop corn popper. Assume suitable attributes and behaviors for each class. Write C++/Java code for the same.	CO2	(10)
4.	a)	Explain the relationship between commonality and variability analysis, perspectives and abstract classes.	CO2	(10)
	b)	A Shape can be implemented using one of the available Drawing programs, say DP1 or DP2. A Shape can be any two dimensional geometrical figure like Square, Circle etc. In future, more Shapes and more Drawing programs can be added. Design the problem using traditional OO Methodology and bring out the limitations of this approach. Sequence diagrams can also be used in support of your answers. Give at least two traditional approaches.	CO2	(10)

UNIT – III

5.	a)	There are two sets of drivers, one each for Display and Print drivers. One ser of drivers caters to Low capacity machines and the other caters to High capacity Machines. They are named as Low-resolution display driver (LRDD), High-resolution display driver (HRDD), Low-resolution print driver (LRPD) and High-resolution print driver (HRPD). There can be mid range machines which use these drivers in different combinations. Use Abstract Factory pattern to design the problem of handling these varying requirements without causing combinatorial explosion of classes.	CO3	(10)

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b) Explain the following object oriented principles with suitable examples: CO3 (10)
   i. Open-Closed principle
   ii. Dependency inversion principle.

6. a) By taking Abstract Factory as an example pattern, explain how do you use design by context to select highly suitable method to implement it. CO3 (10)

   b) An International E-commerce System prints sales order considering different taxes for different regions using Strategy pattern. The new requirement is to add header information to SalesTicket. The headers differ for different companies which use E-commerce system? Which pattern do you use to solve the problem? Write the complete design of the solution. CO3 (10)

UNIT - IV

7. a) Write a design for new requirement to support both oracle and SQL server databases CO4 (05)

   b) Explain the key features of Decorator Pattern. CO4 (08)

   c) Discuss the object pool pattern with an example and solution. CO4 (07)

8. a) Design and implement observer pattern for new requirement to take the following actions whenever a new customer is entered into the system. CO4 (10)
   - Send a welcome e-mail to the customer.
   - Verify the customer's address with the post office.

   b) Discuss the Singleton pattern with key features and Implement it in the context of the E-commerce system CO4 (10)

UNIT – V

9. a) What is software architecture? Discuss three design levels of the software. CO5 (05)

   b) Explain the Repositories architectural styles in detail CO5 (05)

   c) Design the Main program/subroutine with shared data and Pipes and Filters Architectural styles for KWIC [Key Word in Context] index system. CO5 (10)

10. a) Discuss in detail below architectural styles:
    i) Event-based, Implicit Invocation.
    ii) Layered systems. CO5 (10)

    b) Explain in detail the below:
    i) Process-control paradigms.
    ii) A software paradigm for process control. CO5 (10)

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SUPPLEMENTARY SEMESTER EXAMINATIONS – JULY 2017

Course & Branch	:	B.E.-Information Science & Engineering	Semester	:	VII
Subject	:	Software Design Patterns	Max. Marks	:	100
Subject Code	:	IS713	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1.	a)	What is meant by software design? Explain briefly the characteristics of a good design.	CO1	(07)
	b)	"Encapsulation is simply about making the fields of a class private." Discuss in favor or against this statement. Provide enough details to support your discussion.	CO1	(07)
	c)	What are the problems of requirements and how does functional decomposition deal with them?	CO1	(06)
2.	a)	What are the three fundamental reasons to use UML? Describe different types of relations with neat diagrams.	CO1	(07)
	b)	"Inheritance is essential for the existence of Polymorphism." Discuss either in support or against this statement.	CO1	(07)
	c)	What is meant by software modularization? List the various advantages of modularization.	CO1	(06)

UNIT - II

3.	a)	What are the advantages of learning design patterns?	CO2	(10)
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	b)	A Shape can be implemented using one of the available Drawing programs, say DP1 or DP2. A Shape can be any two dimensional geometrical figure like Square, Circle etc. In future, more Shapes and more Drawing programs can be added. Design the problem using traditional OO Methodology and bring out the limitations of this approach. Sequence diagrams can also be used in support of your answers. Give at least two traditional approaches.	CO2	(10)

UNIT – III

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   b) Explain in detail the below: CO5 (10)
   i) Process-control paradigms.
   ii) A software paradigm for process control.

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INSTITUTE OF TECHNOLOGY

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Bangalore – 560 054

SEMESTER END EXAMINATIONS – JANUARY 2017

Course & Branch	:	B.E.-Information Science & Engineering	Semester	:	VII
Subject	:	Software Design Patterns	Max. Marks	:	100
Subject Code	:	IS713	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1.	a)	Several classes shown below contain irrelevant attributes and could be replaced with associations. A person may have three companies as employers. Eack person has an ID. A car is assigned an ID. Cars can be owned by persons, companies or banks. Owner ID refers to ID of person, company or bank who owns the car. Car loan may be involved in purchase of a car. Prepare a class diagram using associations and generalizations. Assign multiplicities also. Person(name, birthdate, employer1ID,employer2ID, employer3ID, personID, address) Car(ownerID, vehicleID, ownertype, model, year) CarLoan(vehicleID, customertype, customerID, accountnumber, bankID, interestRate, currentBalance) Company(name, CompanyID)	CO1	(10)
	b)	Explain Fowler's three perspective of software development with examples.	CO1	(05)
	c)	Write the sequence diagram for Facebook user authentication. Consider :web_browser, :application, :facebook_authorization_server and :facebook_content_server as four interacting objects.	CO1	(05)
2.	a)	Prove that the standard object oriented solution is not sufficient for CAD/CAM problem with clear reasons.	CO1	(10)
	b)	Define the following terms in all three perspectives by Fowler: Object, Class, Abstract class.	CO1	(06)
	c)	Differentiate between types of associations with examples.	CO1	(04)

UNIT - II

3.	a)	Discuss in detail different advantages of studying design patterns.	CO2	(08)
	b)	Explain multiple levels of encapsulation.	CO2	(04)
	c)	How do you design to make abstractions and implementations vary independently of each others? Describe with an example problem.	CO2	(08)
4.	a)	Design for the following specification: A client object displays shapes. But the client has no knowledge of the type of shape. Also, the design will make use of already existing object having incompatible interface.	CO2	(08)
	b)	Explain in detail the advantages of using Façade pattern with an example.	CO2	(08)
	c)	Differentiate between Façade and Adapter pattern.	CO2	(04)

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UNIT - III

5.	a)	What is dependency inversion principle? What are the advantages and flip sides of designing from context?	CO3	(07)
	b)	How does the decorator pattern help to decompose the problem?	CO3	(07)
	c)	What are the three key strategies in the Abstract Factory?	CO3	(06)
6.	a)	What are the process guidelines to be followed in order to create a good design?	CO3	(07)
	b)	How' commonality / variability analysis is better than traditional way of design? Define and elaborate on `one rule', 'one place'. Strategy.	CO3	(07)
	c)	Can patterns help handle variation more efficiently? Justify with an example.	CO3	(06)

UNIT - IV

7.	a)	With an example case study and code snippets in C++/Java, explain all three steps of implementing observer pattern.	CO4	(10)
	b)	What are the problems of using Singleton patterns in multithreaded environment? Give three solutions to resolve the same.	CO4	(10)
8.	a)	Explain double checked locking pattern using all appropriate pattern features.	CO4	(10)
	b)	You are given the task of designing a web-based personal investment system. The general intent of the system is to enable users to look into their personal investments and enter orders to buy and sell stocks. Your main point of concern is throughput and not the response time. In other words, you have to design a system to handle as many transactions as possible without worrying about particular thread's time. Available bandwidth of network connection is also limited. Which design pattern is more suitable for the situation? Justify your answer with the complete design.	CO4	(10)

UNIT - V

9.	a)	Explain any five structural guidelines to be followed in order to create a good design.	CO5	(10)
	b)	Describe the Architecture Business Cycle (ABC) with a neat diagram.	CO5	(10)
10.	a)	Define software architecture. Illustrate the three main architectural structures with suitable examples.	CO5	(10)
	b)	Compare and contrast between patterns, models and architectures.	CO5	(10)

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RAMAIAH
INSTITUTE OF TECHNOLOGY

(Autonomous Institute, Affiliated to VTU)
Bangalore – 560 054

SEMESTER END EXAMINATIONS – JANUARY 2017

Course & Branch	:	B.E.-Information Science & Engineering	Semester	:	VII
Subject	:	Software Design Patterns	Max. Marks	:	100
Subject Code	:	IS713	Duration	:	3 Hrs

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1.	a)	Several classes shown below contain irrelevant attributes and could be replaced with associations. A person may have three companies as employers. Eack person has an ID. A car is assigned an ID. Cars can be owned by persons, companies or banks. Owner ID refers to ID of person, company or bank who owns the car. Car loan may be involved in purchase of a car. Prepare a class diagram using associations and generalizations. Assign multiplicities also. Person(name, birthdate, employer1ID,employer2ID, employer3ID, personID, address) Car(ownerID, vehicleID, ownertype, model, year) CarLoan(vehicleID, customertype, customerID, accountnumber, bankID, interestRate, currentBalance) Company(name, CompanyID)	CO1	(10)
	b)	Explain Fowler's three perspective of software development with examples.	CO1	(05)
	c)	Write the sequence diagram for Facebook user authentication. Consider :web_browser, :application, :facebook_authorization_server and :facebook_content_server as four interacting objects.	CO1	(05)
2.	a)	Prove that the standard object oriented solution is not sufficient for CAD/CAM problem with clear reasons.	CO1	(10)
	b)	Define the following terms in all three perspectives by Fowler: Object, Class, Abstract class.	CO1	(06)
	c)	Differentiate between types of associations with examples.	CO1	(04)

UNIT - II

3.	a)	Discuss in detail different advantages of studying design patterns.	CO2	(08)
	b)	Explain multiple levels of encapsulation.	CO2	(04)
	c)	How do you design to make abstractions and implementations vary independently of each others? Describe with an example problem.	CO2	(08)
4.	a)	Design for the following specification: A client object displays shapes. But the client has no knowledge of the type of shape. Also, the design will make use of already existing object having incompatible interface.	CO2	(08)
	b)	Explain in detail the advantages of using Façade pattern with an example.	CO2	(08)
	c)	Differentiate between Façade and Adapter pattern.	CO2	(04)

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UNIT - III

5.	a)	What is dependency inversion principle? What are the advantages and flip sides of designing from context?	CO3	(07)
	b)	How does the decorator pattern help to decompose the problem?	CO3	(07)
	c)	What are the three key strategies in the Abstract Factory?	CO3	(06)
6.	a)	What are the process guidelines to be followed in order to create a good design?	CO3	(07)
	b)	How' commonality / variability analysis is better than traditional way of design? Define and elaborate on `one rule', 'one place'. Strategy.	CO3	(07)
	c)	Can patterns help handle variation more efficiently? Justify with an example.	CO3	(06)

UNIT - IV

7.	a)	With an example case study and code snippets in C++/Java, explain all three steps of implementing observer pattern.	CO4	(10)
	b)	What are the problems of using Singleton patterns in multithreaded environment? Give three solutions to resolve the same.	CO4	(10)
8.	a)	Explain double checked locking pattern using all appropriate pattern features.	CO4	(10)
	b)	You are given the task of designing a web-based personal investment system. The general intent of the system is to enable users to look into their personal investments and enter orders to buy and sell stocks. Your main point of concern is throughput and not the response time. In other words, you have to design a system to handle as many transactions as possible without worrying about particular thread's time. Available bandwidth of network connection is also limited. Which design pattern is more suitable for the situation? Justify your answer with the complete design.	CO4	(10)

UNIT - V

9.	a)	Explain any five structural guidelines to be followed in order to create a good design.	CO5	(10)
	b)	Describe the Architecture Business Cycle (ABC) with a neat diagram.	CO5	(10)
10.	a)	Define software architecture. Illustrate the three main architectural structures with suitable examples.	CO5	(10)
	b)	Compare and contrast between patterns, models and architectures.	CO5	(10)

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M S RAMAIAH INSTITUTE OF TECHNOLOGY

(AUTONOMOUS INSTITUTE, AFFILIATED TO VTU)

BANGALORE – 560 054

MAKEUP EXAMINATIONS –FEBRUARY 2016

Course & Branch	:	**B.E.- Information Science & Engg.**	**Semester**	:	**VII**
Subject	:	**Software Design Patterns**	**Max. Marks**	:	**100**
Subject Code	:	**IS713**	**Duration**	:	**3 Hrs**

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1.	a)	What are the problems of requirements and reasons for the changing requirements?	C01	(06)
	b)	What is cohesion and coupling?	C01	(04)
	c)	Design the Hospital Management System using UML class diagrams.	C01	(10)
2	a)	What are the essential challenges of functional decomposition?	C01	(07)
	b)	Describes martin fowler three different perspectives in the software development process	C01	(03)
	c)	Write and explain a sequence diagram to access a description of shapes that were stored in a database and then display them.	C01	(10)

UNIT – II

3.	a)	List and explain the key features of a pattern	C02	(08)
	b)	How do you design to make abstractions and implementations vary independently of each others? Describe with an example problem.	C02	(08)
	c)	Differentiate between Façade and Adapter pattern	C02	(04)
4.	a)	List and describe the advantages of design patterns	C02	(08)
	b)	Design for the following specification: A client object displays shapes. But the client has no knowledge of the type of shape. Also, the design will make use of already existing object having incompatible interface	C02	(08)
	c)	Justify the statement "Instead of considering what might force a change in design, consider what you want to be able to change without redesign".	C02	(04)

UNIT – III

5.	a)	Explain Abstract Factory Pattern with key features and design a computer system to display and print shapes from a database.	C03	(10)
	b)	Explain commonality and variability analysis with an example	C03	(10)

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6. a) What are the five possible errors in using design patterns? Explain C03 (10)
   b) Discuss decorator pattern with an example and solution C03 (10)

UNIT – IV

7. a) Design for new requirement to take the following actions whenever a new customer is entered into the system C04 (10)
   - Send a welcome e-mail to the customer
   - Verify the customer's address with the post office

   b) Discuss the object pool pattern with an example and solution C04 (10)

8. a) Explain the Singleton pattern with an example problem and solution C04 (10)
   b) Write a design for new requirement to support both oracle and SQL server databases C04 (10)

UNIT – V

9. a) Explain with a diagram the architectural business cycle C05 (10)
   b) What are the three fundamental reasons for importance of software architecture C05 (03)
   c) Discuss different process recommendations that should be followed when designing an architecture C05 (07)

10. a) Define the below C05 (06)
      i) Architectural patterns
      ii) Reference models
      iii) Reference architecture

   b) Discuss structural (or Product) rules of thumb that should be followed when designing an architecture C05 (08)
   c) Discuss any six architecture activities C05 (06)

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BANGALORE – 560 054

MAKEUP EXAMINATIONS –FEBRUARY 2016

Course & Branch	:	**B.E.- Information Science & Engg.**	**Semester**	:	**VII**
Subject	:	**Software Design Patterns**	**Max. Marks**	:	**100**
Subject Code	:	**IS713**	**Duration**	:	**3 Hrs**

Instructions to the Candidates:

- Answer one full question from each unit.

UNIT – I

1.	a)	What are the problems of requirements and reasons for the changing requirements?	C01	(06)
	b)	What is cohesion and coupling?	C01	(04)
	c)	Design the Hospital Management System using UML class diagrams.	C01	(10)
2	a)	What are the essential challenges of functional decomposition?	C01	(07)
	b)	Describes martin fowler three different perspectives in the software development process	C01	(03)
	c)	Write and explain a sequence diagram to access a description of shapes that were stored in a database and then display them.	C01	(10)

UNIT – II

3.	a)	List and explain the key features of a pattern	C02	(08)
	b)	How do you design to make abstractions and implementations vary independently of each others? Describe with an example problem.	C02	(08)
	c)	Differentiate between Façade and Adapter pattern	C02	(04)
4.	a)	List and describe the advantages of design patterns	C02	(08)
	b)	Design for the following specification: A client object displays shapes. But the client has no knowledge of the type of shape. Also, the design will make use of already existing object having incompatible interface	C02	(08)
	c)	Justify the statement "Instead of considering what might force a change in design, consider what you want to be able to change without redesign".	C02	(04)

UNIT – III

5.	a)	Explain Abstract Factory Pattern with key features and design a computer system to display and print shapes from a database.	C03	(10)
	b)	Explain commonality and variability analysis with an example	C03	(10)

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IS713

6. a) What are the five possible errors in using design patterns? Explain C03 (10)
   b) Discuss decorator pattern with an example and solution C03 (10)

UNIT – IV

7. a) Design for new requirement to take the following actions whenever a new customer is entered into the system C04 (10)
   - Send a welcome e-mail to the customer
   - Verify the customer's address with the post office

   b) Discuss the object pool pattern with an example and solution C04 (10)

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   b) Write a design for new requirement to support both oracle and SQL server databases C04 (10)

UNIT – V

9. a) Explain with a diagram the architectural business cycle C05 (10)
   b) What are the three fundamental reasons for importance of software architecture C05 (03)
   c) Discuss different process recommendations that should be followed when designing an architecture C05 (07)

10. a) Define the below
      i) Architectural patterns
      ii) Reference models
      iii) Reference architecture C05 (06)

   b) Discuss structural (or Product) rules of thumb that should be followed when designing an architecture C05 (08)
   c) Discuss any six architecture activities C05 (06)

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