Enrollment No. EN2LCS3016.64

Faculty of Engineering
Mid Sem II Examination April -2023
CS3CO37 Advanced Java Programming

Programme: B.Tech.

Branch/Specialisation: CS-All

Duration: 1.5Hrs.

Maximum Marks: 30

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	CO	PO	PSO
Q.1	i.	What are the major components of the JDBC?	1	BL2	CO3	PO1	

a. DriverManager, Driver, Connection, Statement, and ResultSet

b. DriverManager, Driver, Connection, and Statement

c. DriverManager, Statement, and ResultSet

d. DriverManager, Connection, Statement, and ResultSet.

			Marks	BL	CO	PO	PSO
	ii.	Java code is embedded under which tag in JSP?	1	BL1	CO3	PO1	

a. Declaration   b. Scriptlet

c. Expression   d. Comment

			Marks	BL	CO	PO	PSO
	iii.	JSP uses server-side scripting that is translated into ... and compiled before they are run.	1	BL1	CO3	PO1	

a. Applet   b. Servlets

c. HTML   d. JavaScript

			Marks	BL	CO	PO	PSO
	iv.	What is the main purpose of the Spring Framework?	1	BL1	CO4	PO1	

a. To provide a comprehensive programming and configuration model for Java-based enterprise applications.

b. To provide a comprehensive programming and configuration model for JavaScript-based web applications.

c. To provide a comprehensive programming and configuration model for PHP-based web applications.

d. To provide a comprehensive programming and configuration model for Python-based web applications.

v. Which interface out of the following options will you use to perform destruction of beans in the context of the life cycle methods?   1

    a. Initializing Bean
    b. Post Construct
    c. Disposable Bean
    d. Pre Destroy

vi. Spring is a _____ framework?   1   BL1 CO4 PO1
    a. free
    b. open source
    c. under license
    d. proprietary

Q.2	i.	What do you mean by API ?	2	BL1	CO3	PO1
	ii.	Explain JSP building blocks in detail?	4	BL1	CO3	PO1
	iii.	Write all the steps of java application with Database.	6	BL3	CO3	PO3
OR	iv.	Explain any five implicit object of JSP with HTML and JSP tag.	6	BL3	CO3	PO1
Q.3	i.	What do you mean by spring framework?	2	BL1	CO4	PO1
	ii.	What is the importance of the Container class in Java?	4	BL1	CO4	PO1
	iii.	What do you mean by dependency injection?	6	BL1	CO4	PO2
OR	iv.	Write the Difference between POJO and Bean.	6	BL2	CO4	PO2

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Faculty of Engineering
Mid Sem II Examination April -2023
CS3EL11/IT3CO29 Statistical Analysis/Computational Statistics

Programme: B.Tech.   Branch/Specialisation: CS-All/IT

Duration: 1.5Hrs.   **Maximum Marks: 30**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	CO	PO	PSO
Q.1	i.	Which one of the distribution is discrete distribution	1	BL$_{01,2}$	CO$_{01}$	PO$_{01}$	PSO$_{02,01}$
		a. Exponential distribution					
		b. Normal Distribution					
		c. Poisson Distribution*					
		d. None of these.					
	ii.	In which distribution, curve is symmetrical about mean	1	BL$_{01,2}$	CO$_{01}$	PO$_{01}$	PSO$_{02}$
		a. Binomial distribution					
		b. Exponential Distribution					
		c. Poisson Distribution					
		d. None of these.					
	iii.	"For any binomial distribution mean is 5 and standard distribution is 3". The above statement is	1	BL$_{01}$	CO$_{02}$	PO$_{01}$	PSO$_{02}$
		a. False b. True					
		c. Can't say d. None of these.					
	iv.	If $r = 1$, then correlation coefficient is	1	BL$_{01,2}$	CO$_{01}$	PO$_{01}$	PSO$_{02}$
		a. perfect and positive					
		b. Perfect and negative					
		c. High degree and positive					
		d. None of these.					
	v.	If $r = 0$, then the regression lines are	1	BL$_{01,2}$	CO$_{01}$	PO$_{01}$	PSO$_{02}$
		a. Identical b. Perpendicular to each other					
		c. Parallel to each other d. None of these.					

vi. The normal equation for fitting of a straight line $y = ax + b$ is $\sum xy = $ _____

   a. $a \sum x + b \sum y$ b. $ma + b \sum x$

   c. $a \sum x + b \sum x^2$ d. None of these.

1   BL᷉ CO᷉ PO᷉ PSO᷉

Q.2

i. Explain exponential distribution.   2   BL᷉ CO᷉ PO᷉ PSO᷉

ii. Six dice are thrown 729 times. How many times do you expect at least three dice to show a five or six?   3   BL᷉ CO᷉ PO᷉ PSO᷉

iii. Find the first and second moment about origin for poisson distribution.   7   BL᷉ CO᷉ PO᷉ PSO᷉

OR iv. In a test on 2000 electric bulbs, it was found that the life of a particular make was normally distributed with an average life of 2040 hours and standard deviation of 60 hours. Estimate the number of bulbs likely to burn for   7   BL᷉ CO᷉ PO᷉ PSO᷉

   a. more than 2150 hours

   b. less than 1950 hours.

Q.3

i. Write the equations of regression line.   2   BL᷉ CO᷉ PO᷉ PSO᷉

ii. Show that the coefficient of correlation is the geometric mean of the coefficient of regression.   3   BL᷉ CO᷉ PO᷉ PSO᷉

iii. Find the rank correlation coefficient for the following data: 7   BL᷉ CO᷉ PO᷉ PSO᷉

X	68	64	75	50	64	80	75	40	55	64
Y	62	58	68	45	81	60	68	48	50	70

OR iv. Fit second degree parabola to the following data regarding x as an independent variable: 7   BL᷉ CO᷉ PO᷉ PSO᷉

x:	0	1	2	3	4
y:	1	5	10	22	38

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Faculty of Engineering
Mid Sem II Examination April -2023
CS3CO39 Database Management System

Programme: B.Tech.   Branch/Specialisation: CS-All
Duration: 1.5Hrs.   Maximum Marks: 30

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

			Marks	BL	CO	PO	PSO
Q.1	i.	4NF is designed to cope up with :	1	BL01	CO3	PO01	
		a) Transitive dependency					
		b) Join dependency					
		c) Multi valued dependency					
		d) None of these					
	ii.	5NF should restrict the.......... :	1	BL01	CO3	PO01	
		a) Transitive dependency					
		b) Join dependency					
		c) Multi valued dependency					
		d) None of these					
	iii.	Data that causes inconsistency leads to:	1	BL01	CO3	PO01	
		a) Data integrity					
		b) Data redundancy					
		c) Data anomaly					
		d) Good data					
	iv.	Transaction enters into its _____ state when it finishes the final statement.	1	BL01	CO4	PO01	
		a) Abort state					
		b) Partially committed state					
		c) Committed state					
		d) Active state					
	v.	In locking Protocols what exclusive mode defines.	1	BL01	CO4	PO01	
		a) Read only					
		b) Write only					
		c) Read and Write both					
		d) None					

vi.	A system is in a _____ state if there exists a set of transactions such that every transaction in the set is waiting for another transaction in the set.	1 BL01 CO4 PO01

        a) Idle
        b) Waiting
        c) Deadlock
        d) Ready

Q.2 i.	Discuss problems caused by redundancy and the purpose of normalization.	2 BL02 CO3 PO02
ii.	Define functional dependency and explain its uses in database design.	2 BL02 CO3 PO02
iii.	What is key ? Explain the following keys with example :	3 BL03 CO3 PO02

        a) Candidate Key
        b) Primary Key
        c) Foreign Key

iv.	Find all CANDIDATE KEYs and Prime and non-Prime attributes in the following relation:	5 BL03 CO3 PO03

R(ABCDEFGH)

FD: $CH \rightarrow G, A \rightarrow BC, B \rightarrow CFH \quad .E \rightarrow A,$

$F \rightarrow EG$

OR v.	Find the all CANDIDATE KEY of the following:	5 BL03 CO3 PO03

    a) R(A,B,C,D) and
        FD={A→B,B→C,C→D}
    b) R(A,B,C,D) and
        FD={A→B,B→C,C→D,D→A}

Q.3 i.	Define a Transaction? List the properties of transactions and explain them.	3 BL01 CO4 PO01
ii.	Draw a transaction state diagram and describe each state that a transaction goes through during its execution.	4 BL03 CO4 PO01
iii.	What is the 2-phase locking protocol? How does it guarantee serializability?	5 BL02 CO4 PO03
OR iv.	Explain the different types of failures in DBMS.	5 BL01 CO4 PO01

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Programme: B.Tech.

Branch/Specialisation: CS-All

Duration: 1.5 Hrs.

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			Marks	BL	CO	PO	PSO
Q.1	i.	Which of the following Language is Context free	1	BL01	CO01	PO3	PSO3

a. L– a^n, n is prime number

b. L– $a^n b^n c^m$, n,m >–0 & n<–m

c. L= $a^n b^n$ n>–0

d. All of the above

			Marks	BL	CO	PO	PSO
	ii.	Context free language is not closed under which operation	1	BL02	CO01	PO3	PSO3

a. Union   b. Intersection

c. Complement   d. Reverse

			Marks	BL	CO	PO	PSO
	iii.	Which of the following production rule violates the condition of GNF	1	BL01	CO03	PO3	PSO3

a. A->AB   b. A->aBDG

c. A->a   d. A->bB

			Marks	BL	CO	PO
	iv.	Consider the following statement	1	BL02	CO04	PO2

I. CYK is a membership algorithm applied only on a grammar in CNF form.

II. If a grammar G is ambiguous than language generated by G will also be ambiguous.

III. There exist a deterministic PDA for every context free language

IV. One of the applications of context free grammar exists in compilation of source programs from high level to low level language.

Select the correct statement-

a.   I & II   b.   II & III

c.   I & IV   d.   I,II & IV

v. Select the correct statement
   a. Each NPDA can be converted into equivalent DPDA
   b. Push down automata is equivalent to finite automata with memory in the form of input tape.
   c. NPDA is more powerful than DPDA
   d. None of the above

vi. Which of the following is not a context free language
   a. WcW, W is any string over a and b.
   b. WcW^r, W is any string over a and b,r denotes the reverse.
   c. WW^r, W is any string over a and b, r denotes the reverse.
   d. Language only contains the strings with balanced parentheses.

Q.2 i. State whether the given context free grammar is ambiguous or unambiguous.
       S->A/B , A->aAb/ab , B->abB/ ε

   ii. Remove the unit production and null production rule from the given grammar
       S->AaB/AB/A
       A->aA/a B->b/bB/ ε

   iii. Explain the CYK algorithm with example?

OR iv. Explain the closure properties of context free language.

Q.3 i. Explain the notion of acceptance in push down automata

   ii. Define PDA with Tuples.

   iii. Explain the conversion of context free grammar in to equivalent push down automata using below CFG
        S->aAB
        A->a
        B->bB/b

OR iv. Explain the pumping lemma for context free language with example

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Programme: B.Tech.   Branch/Specialisation: CS-All

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			Marks	BL.	CO	PO	PSO
Q.1	i	The address generated by the CPU is referred to as a) Physical address b) Logical address c) Neither physical nor logical d) None	1	BL_{01}	CO_{02}	PO_{01}	PSO_{08}
	ii	Physical memory is broken into fixed-sized blocks called a) Frames b) Pages c) Backing Store d) Segment	1	BL_{01}	CO_{02}	PO_{01}	PSO_{11}
	ii	Which table contains the base address of each page in physical memory a) process b) memory c) page d) frame	1	BL_{01}	CO_{02}	PO_{02}	PSO_{08}
	iv	Which algorithm chooses the page that has not been used for the longest period of time whenever the page required to be replaced a) FIFO b) LRU c) Optimal d) None	1	BL_{02}	CO_{03}	PO_{03}	PSO_{12}
	v	A process refers to 5 pages, A, B, C, D, E in the order : A, B, C, D, A, B, E, A, B, C, D, E. If the page replacement algorithm is FIFO, the number of page transfers with an empty internal store of 3 frames is a) 8 b) 10 c) 9 d) 7	1	BL_{02}	CO_{03}	PO_{01}	PSO_{12}

vi	Memory allocation and deallocation is managed by a) CPU b) MMU c) GPR d) None	1	BL_{01}	CO_{03}	PO_{03}		
Q.2 i.	Define fixed and dynamic partition of memory with example.	2	BL_{01}	CO_{02}	PO_{02}	PSO_{08}	
ii.	Write down the difference between logical address space and physical address.	2	BL_{02}	CO_{02}	PO_{01}	PSO_{05}	
iii.	Differentiate Paging and Segmentation.	3	BL_{02}	CO_{02}	PO_{03}	PSO_{10}	
iv.	Consider six memory partitions of size 200 KB, 400 KB, 600 KB, 500 KB, 300 KB and 250 KB. These partitions need to be allocated to four processes of sizes 357 KB, 210 KB, 468 KB and 491 KB in that order. Perform the allocation of processes using first fit, best fit and worst fit algorithm.	5	BL_{03}	CO_{02}	PO_{01}	PSO_{10}	
OR v.	Explain the concept of paging with segmentation using suitable example.	5	BL_{02}	CO_{02}	PO_{02}	PSO_{08}	
Q.3 i.	What is demand paging.	2	BL_{01}	CO_{03}	PO_{01}	PSO_{11}	
ii.	Explain the concept of Virtual Memory.	4	BL_{02}	CO_{03}	PO_{02}	PSO_{12}	
iii.	Explain Belady's Anomaly with example. Which algorithm suffers from this problem.	6	BL_{02}	CO_{03}	PO_{04}	PSO_{13}	
OR iv.	Consider a reference string: 4, 7, 6, 1, 7, 6, 1, 2, 7, 2. the number of frames in the memory is 3. Find out the number of page faults using FIFO, LRU and Optimal page replacement algorithm.	6	BL_{01}	CO_{03}	PO_{02}	PSO_{04}	

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			Marks	BL	CO	PO	PSO
Q.1	i.	The number of address bits that are present in Microprocessor 8085 are	1	BL02	CO3	PO3. PO11	
		a. 8 b. 32 c. 64 d. 16					
	ii.	A memory system has a total of 8 memory chips each with 12 address lines and 4 data lines. The total size of the memory system is	1	BL02	CO3	PO3. PO11	
		a. 16KB b. 32KB c. 48KB d. 64KB					
	iii.	How many types of system buses are connected to the 8085 microprocessor?	1	BL02	CO3	PO3. PO11	
		a. 3 b. 5 c. 6 d. 4					
	iv.	How many machine cycles are required by the instruction LDA 3000H.	1	BL01	CO4	PO3. PO5. PO11	
		a. 2 machine cycle b. 5 machine cycle c. 4 machine cycle d. 1 machine cycle					
	v.	Which of following is a non-maskable interrupt?	1	BL02	CO4	PO3. PO5. PO11	
		a. RST 6.5 b. TRAP c. RST 7.5 d. INTR					

vi.	Which of the following is non vectored interrupt? a. RST 7.5 b. INTR c. RST 4.5 d. TRAP	1	BL02	CO4	PO3, PO5, PO11
Q.2 i.	What do you mean memory interfacing? Give an example.	2	BL02	CO3	PO3
ii.	Differentiate between Memory mapped I/O interfacing and I/O mapped I/O interfacing techniques.	4	BL02	CO3	PO3, PO11
iii.	Draw the interfacing of 4K RAM having starting address of 7000H with 8085 Microprocessor. Use de-multiplexed address/data lines and 3:8 decoder.	6	BL02	CO3	PO3, PO11
OR iv.	Draw and explain the programmable timer interface (Intel 8253/54) with 8085.	6	BL02	CO3	PO3, PO11
Q.3 i.	What is a machine cycle? Give an example.	2	BL02	CO4	PO3, PO11, PO5
ii.	Explain maskable and non maskable interrupts with examples.	4	BL01	CO4	PO3, PO11, PO5
iii.	Draw the timing diagram for Memory Read Operation in 8085.	6	BL02	CO4	PO3, PO11, PO5
OR iv.	Draw the timing diagram for MOV A, B Instruction in 8085.	6	BL03	CO4	PO3, PO11, PO5

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			Marks	BL.	CO	PO	PSO

Q.1 i. Users have the ability to customize and save a desktop so it will look the same way each time a particular user logs on in _____ — 1 · BL2 · CO3 · PO
   a) Assisted desktop b) Persistent desktop
   b) Non-Persistent desktop d) All of the mentioned

ii. Which choice below most accurately describes a business continuity program? — 1 · BL2 · CO3 · PO
   a) Ongoing process to ensure that the necessary steps are taken to identify the impact of potential losses and maintain viable recovery
   b) A program that implements the mission, vision, and strategic goals of the organization
   c) A determination of the effects of a disaster on human, physical, economic, and natural resources
   d) A standard that allows for rapid recovery during system interruption and data loss

iii. Why is it important to test disaster recovery plans frequently? — 1 · BL4 · CO3 · PO3
   a) The businesses that provide subscription services might have changed ownership.
   b) A plan is not considered viable until a test has been performed
   c) Employee might get bored with planning process
   d) Natural disaster can change frequently.

iv. What is the default level of access a newly created IAM User is granted? — 1 · BL1 · CO4 · PO2
   a) Administrator access to all AWS services.
   b) Power user access to all AWS services
   c) Read only access to all AWS services.
   d) No access to any AWS services.

v. Email, attachments, FTP sites is an example of which state of digital data? — 1 · BL2 · CO4 · PO3
   a) Data at rest
   b) Data in flight
   c) Data in use
   d) All of the above

vi. Attack that allows an attacker to access the host system from within the virtual systems? — 1 · BL2 · CO4 · PO2
   a) VM sprawl
   b) VDI snapshot
   c) VM escape
   d) Type II Hypervisor

Q.2 i. How VDI does differs from Daas primarily? — 2 · BL2 · CO3 · PO2

ii. If you want to take responsibility for some of the aspects of disaster recovery plan .Which model of Disaster recovery is a better choice and why? — 2 · BL4 · CO3 · PO2

iii. Explain basic architecture of Iaas with fundamental components? — 3 · BL2 · CO3 · PO1

iv. Describe the various steps involved in SLA — 5 · BL2 · CO3 · PO2

OR v. What are the different considerations while choosing DRaas? — 5 · BL2 · CO3 · PO2

Q.3 i. Illustrate the certain aspects to manage security in cloud? — 2 · BL4 · CO4 · PO2

ii. Distinct between the different data states? — 4 · BL2 · CO4 · PO5

iii. Briefly describe various Virtualization technology weakness. — 6 · BL2 · CO4 · PO5

OR iv. State the various best practices for keeping virtual environment safe? — 6 · BL2 · CO4 · PO5

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