B.TECH (VII Sem) EXAMINATION, NOV-DEC 2023
UIT (Autonomous), RGPV
SOFTWARE ENGINEERING

CS712(A)

Time: 03 hrs **Max Marks : 105**

Instructions: Attempt all questions. Parts a,b, c of each question are compulsory for which the allotted marks are 3,4,4 respectively, and d & e part will have an internal choicefor which the allotted marks is 10. All subparts of a question should be answered at one place.

Q. No.	Question	CO
1(a)	What is Software Engineering? Is it an art, craft or science discuss?	1
(b)	What is Capability Maturity Model(CMM)?	1
(c)	Describe the characteristics of software contrasting it with the characteristics of hardware?	1
(d)	Explain waterfall model for software development with diagram? Write down its advantages and disadvantages also?	1
	OR	
(e)	Explain the spiral model of software development? What are the limitations of such a model?	1
2(a)	What are crucial process steps of requirement engineering? Discuss with the help of a diagram.	2
(b)	What are the components of Use Case Diagram? Write down their uses with the help of an example.	2
(c)	Draw the E-R diagram for a Hotel Reception Desk Management?	2
(d)	Discuss the difference between the following functional and non functional requirements user and system requirements?	2
	OR	
(e)	Consider the problem of a Railway Reservation system and design the following (i) problem statement (ii)use case diagram (iii) use cases	2
3(a)	List out the major differences between Function oriented design and Object Oriented design?	3
(b)	Draw the use case diagram for Library Management System?	3
(c)	Elaborate the various studies of design? Which design strategy is most popular and practical?	3
(d)	What do you understand by Modularity? Explain Module Coupling and Module Cohesion along with its various types?	3
	OR	
(e)	What is the difference between static and dynamic models in the context of object oriented modelling of systems? Identify the UML diagrams which provide these two models respectively	3
4(a)	Define the following terms : (i) Fault (ii) Failure (iii) Bug (iv) Mistake	4
(b)	What is difference between (i) Functional and structural Testing (ii)Alpha and Beta Testing	4
(c)	What is meant by Test Case design? Discuss its objectives and indicate the steps involved in test case design?	4
(d)	Describe Black Box and White Box Testing by taking any one suitable example for each testing.	4
	OR	
(e)	Discuss the differences between code walkthrough and code inspection. Compare the relative merits and demerits of code inspection and code walkthrough.	4
5(a)	What is Reverse Engineering? Discuss levels of Reverse Engineering?	5
(b)	Explain why high degree of coupling among modules can make maintenance very difficult?	5
(c)	What do you understand by software maintenance? Discuss its various categories?	5
(d)	Explain briefly : (i) Component based Software Engineering (ii) Client/Server Software engineering (iii) Computer Aided Software Engineering	5
	OR	
(e)	The development effort for a software project is 500 person-months. The empirically determined constant (K) is 0.3. The complexity of the code is quite high and is equal to 8 . Calculate the total effort expanded(M) if (i)maintenance team has good level of understanding of the project (d=0.9) (ii) maintenance team has poor understanding of project(d=0.1)	5

UIT(Autonomous) RGPV, BHOPAL

Examination: Nov-Dec 2023

Time: 03 hrs
Subject Code: CS 713 A
Subject Name: Network Security

Max Marks: 105

Instructions:Attempt all questions. Parts a,b, and c of each question are compulsory forwhich the allotted marks are 3,4,4 respectively, andthe d &e part will have an internal choice forwhich the allotted Z is 10. All subparts of a question should be answered in one place.

Q. No.	Question	CO
1(a)	Discuss the role of access control in maintaining security. Provide examples.	CO
(b)	Explain what shrink wrap code is and discuss its potential security risks.	CO1
(c)	Define intrusion and describe the key terminologies related to intrusion detection systems (IDS)	CO 1
(d)	Define penetration testing and categorize the different types of penetration testing.	CO 1
	OR	
(e)	Discuss the significance of risk assessment in developing a security strategy.	CO 1
2(a)	Explain the process of encryption and decryption in classical cryptographic techniques.	CO 2
(b)	Explain different cryptography attacks, with a focus on brute-force attacks. Provide examples.	CO 2
(c)	Explain the RSA algorithm. Provide a step-by-step numerical example of key generation, encryption, and decryption.	CO 2
(d)	Explain the Diffie-Hellman key exchange algorithm and Perform a Diffie-Hellman key exchange with the following values: p = 23, g = 5, and the private keys a = 6 and b = 15.	CO2
	OR	
(e)	Compare and contrast the cryptographic algorithms RC4, RC5, RC6, and Blowfish.	CO2
3(a)	Explain the concept of one-way hash functions and their applications in cybersecurity.	CO3
(b)	Explain the Kerberos authentication protocol, including its components and functioning.	CO3
(c)	Explain the Elliptic Curve Digital Signature Algorithm (ECDSA) and the ElGamal Signature Scheme.	CO3
(d)	Using an elliptic curve $y2=x3+ax+b$, a base point G, and a private key d, compute the public key $Q=dG$ and perform ECDSA signature generation.	CO3
	OR	
(e)	Discuss the Secure Hash Algorithm (SHA), focusing on SHA-256. Provide an example of how it operates.	CO3
4(a)	Outline the characteristics of viruses and worms.	C04
(b)	Define Trojans and explain the differences between overt and covert channels.	C04
(c)	Explain the process of sniffing, identify vulnerable protocols, and classify types of sniffers.	C04
(d)	Explain the phishing process and elaborate on different attack types, including Man-in-the-Middle Attacks, URL Obfuscation Attacks, Hidden Attacks, Client-side Vulnerabilities, Deceptive Phishing, Malware-Based Phishing, DNS-Based Phishing, Content-Injection Phishing, and Search Engine Phishing.	C04
	OR	
(e)	Explain the Smurf Attack, Buffer Overflow Attack, Ping of Death Attack, Teardrop Attack, SYN Attack, SYN Flooding, and Distributed Denial-of-Service (DDoS) Attack.	C04
5(a)	Explain the importance of IP Security. Discuss the components of the IP Security architecture.	C05
(b)	Explain Cross-Site Request Forgery (CSRF) and Cross-Site Scripting (XSS) vulnerabilities. Provide examples of how they can be exploited.	C05
(c)	Outline the objectives of a computer forensic investigation. Discuss the stages and steps involved in forensic investigation.	C05
(d)	Explain the concept of footprinting in the context of hacking. Why is it an essential phase?	C05
	OR	
(e)	Discuss the types of scanning in hacking, including Port Scanning, Network Scanning, and Vulnerability Scanning.	C05

0101CS201052

UIT(Autonomous) RGPV, BHOPAL

Examination: Nov-Dec 2023

Time: 03 hrs **Max Marks : 105**

Subject Code: CS 701

Subject Name: Compiler Design

Instructions: Attempt all questions. Parts a, b, c of each question are compulsory for which the allotted marks are 3, 4 ,4 respectively, and d & e part will have an internal choice for which the allotted marks is 10. All subparts of a question should be answered at one place.

Q. No.	Question	CO
1(a)	Define Lexeme.	1
(b)	Write the main functions performed by lexical analyzer.	1
(c)	Write the difference between compiler and interpreter.	1
(d)	Explain Analysis phase of compiler with help of suitable diagram.	1
	OR	
(e)	Write a LEX program to identify tokens from a given C program.	1
2(a)	What do you mean by ambiguous grammar? Explain with an example .	2
(b)	Explain the concept of syntax directed definition.	2
(c)	For the given expression 2+3*4 construct annonated parse tree for given grammar E→ E+T /T T→ T*F /F F→ (E) /id	2
(d)	Consider the following grammar. Prove that the grammar is CLR but not LALR S→ Aa /bAc /Bc /bBA A→d B→d	2
	OR	
(e)	Construct operator precedence parser for a given grammar E→ E+T /T T→ T*F /F F→ (E) /id	2
3(a)	Explain the working of symbol table.	3
(b)	Explain the concept of polymorphic functions.	3
(c)	What are the contents of activation records.	3
(d)	Explain the difference between static, stack and heap allocation.	3
	OR	
(e)	Explain the specification of simple type checker for statements ,expressions and functions.	3
4(a)	Explain the concept of backpatching.	4
(b)	Define basic blocks, flowgraph with example.	4
(c)	Write Triple and Quadruple for the given expression Z=a - b *c↑ d / e +f	4

(d)	Write three address code for a given code
	If a<b then
	X=y+z
	Else
	P=q+r
		4

	OR	
(e)	Construct DAG for expression a=(a*b) / c +(a*b) ↑ d –e/ (a*b)	4
5(a)	What are the characteristics of peephole optimization.	5
(b)	What do you mean by Induction variable?	5
(c)	What are the properties of optimizing compilers?	5
(d)	What do you mean by machine dependent and machine independent optimization.	5
	OR	
(e)	Compare local optimization with global optimization ,Give suitable examples.	5

Page.....

Roll Number.....0101CS201052

CSE (VII Sem.) EXAMINATION, DEC-2023

UIT (Autonomous) RGPV

(INFORMATION STORAGE & MANAGEMENT)

CS-705/715(B)

Time: Three Hours **Maximum Marks: 105**

Note: Attempt all the questions. Parts a, b, c of each question are compulsory consist of (3, 4, 4 marks) respectively, and d & e part will have an internal choice of (10 marks). All subparts of a question should be answered at one place.

Q1 a) What is Data categorization? [CO1]

b) What problems arise due to data proliferation ? [CO1]

c) What are the ILM benefits that directly address the challenges of information management ? [CO1]

d) Explain briefly the evolution of storage management. [CO1]

OR

e) What are the challenges of storing and managing unstructured data ? [CO1]

Q2 a) What is modular arrays? [CO2]

b) Explain in brief Stripping and Mirroring [CO2]

c) Define and explain hot sparing . [CO2]

d) Discuss the impact of Random and Sequential I/O in different RAID Configuration. [CO2]

OR

e) Explain terms Hot Spares? What are the methods used for data recovery in hot spares? [CO2]

Q3 a) What is JBOD ? [CO3]

b) Explain in brief DAS and External DAS. [CO3]

c) How flow control works in FC networks. [CO3]

d) Differentiate between Multi-mode fiber and single-mode fiber. [CO3]

OR

e) Explain the key benefits of NAS. [CO3]

Q4 a) what is virtualization? Why its required ? [CO4]

b) What is SMI-S. Explain its [CO4]

c) Write a brief notes on Data Center. [CO4]

d) Enlist and explain some of the common pitfalls that come with virtualizations. [CO4]

OR

e) What is the purpose of performing operation backup and disaster recovery [CO4]

Q5 a) What is Cloud security? Explain Cloud Vocabulary. [CO5]

b) Describe the term "storage on cloud". [CO5]

c) Discuss the different barriers of cloud computing. [CO5]

d) Explain the cloud security design principles. [CO5]

OR

e) Write a brief notes on concept of virtualization [CO5]

B.TECH (VII Sem) EXAMINATION, NOV-DEC 2023

UIT (Autonomous), RGPV

Internet of Things

CS-704/714(C)

Time: Three Hours **Maximum Marks: 105**

Note: Attempt all the questions. Parts a, b, c of each question are compulsory consist of (3, 4, 3 marks) respectively, and d & e part will have an internal choice of (10 marks). All subparts of a question should be answered at one place.

Q1 (CO1)

(a) Describe about sensor used in IOT.
(b) Summarize the characteristics of IOT.
(c) Sketch the Physical Design of IOT.
(d) Explain about Design Conceptual Framework for IOT with the help of example.

OR

(e) Write about Application of IOT and also discuss its challenges.

Q2 (CO2)

(a) Explain machine to machine communicate.
(b) Illustrate about SDN.
(C) Summarize data storage in IOT
(d) Describe about Network Function Virtualization.

OR

(e) Describe about IOT Cloud based services.

Q3. (CO3)

(a) Write Principles for Web Connectivity.
(b) Summarize Message communication protocol for connected devices.
(c) Write Internet Connectivity Principles.
(d) Describe about IP Addressing in IoT.

OR

(e) Illustrate about Media Access control.

Q4 (CO4)

(a) Write List of sensor used in IOT.
(b) Discuss about data Communication Protocols.
(c) Distinguish between Industrial IOT and Automotive IOT
(d) Describe RFID Technology with the help of example.

OR

(e) Illustrate Wireless sensor network technology.

Q5. (CO5)

(a) Write about Process of IoT.
(b) Discriminate functional view and Operational View.
(c) Write Security and Privacy Issue in IoT.
(d) Explain about how using IOT in streetlight control and monitoring system.

OR

(e) Describe about Methodology of IOT Design.