



VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN

[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]

Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 5002

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – April / May 2023

Eighth Semester

Computer Science and Engineering

U19CSE23 – INFORMATION SECURITY

(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	List down a few critical characteristics of Information.	2	K1	CO1
2.	Define the various components of an Information System.	2	K2	CO1
3.	Why Information Security is needed?	2	K2	CO2
4.	Tabulate the difference between a threat and an attack? Give real-time examples pertaining to Information Security.	2	K2	CO2
5.	Recall the phrase Risk Management.	2	K2	CO3
6.	Briefly discuss the steps to perform Risk Assessment?	2	K1	CO3
7.	Define Information Security Policy.	2	K1	CO4
8.	Outline the goal of ISO 17799/BS 7799?	2	K2	CO4
9.	Discuss the philosophy behind the term “cryptology”.	2	K2	CO5
10.	What are the Access Control Devices used for Information Security?	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

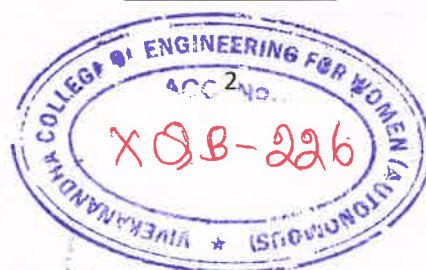
Q.No.	Questions	Marks	KL	CO
11. a)	i. Describe in detail about how we can balance Security and Access in the context of Information Security.	6	K2	CO1
	ii. Brief about each critical characteristics of Information with example.	7	K3	CO1
(OR)				
b)	i. Demonstrate NSTISSC Security Model in details with appropriate illustration.	6	K2	CO1
	ii. Analyze the importance of NSTISSC Security Model in Information Security.	7	K4	CO1

12. a)	i.	Briefly explain the need of Information Security with real-life examples.	6	K2	CO2
	ii.	What are the business needs of Information Security? Explain with suitable examples.	7	K3	CO2
(OR)					
b)	i.	Explain in detail the Legal, Ethical and Professional issues in Information Security.	5	K2	CO2
	ii.	Demonstrate the process of identifying threats in an Information System.	8	K1	CO2
13. a)	i.	List down the various stages of Information Security Risk Management? Explain in details.	6	K3	CO3
	ii.	Give an example of real-life scenario of Risk Management.	7	K3	CO3
(OR)					
b)	i.	Why is Risk Management important in Information Security from your point of view?	6	K3	CO3
	ii.	What are the steps for an Information Security Risk Assessment? Explain in detail.	7	K3	CO3
14. a)	i.	Briefly describe the VISA International Security Model.	6	K2	CO4
	ii.	Analyze the importance of VISA Information Security Model.	7	K4	CO4
(OR)					
b)	i.	With appropriate illustration, demonstrate Security Architecture Model	7	K2	CO4
	ii.	Analyze the importance of Security Architecture in details.	6	K4	CO4
15. a)	i.	Elaborate the role of Cryptography in Information Security.	8	K3	CO5
	ii.	Explain physical security in detail.	5	K3	CO5
(OR)					
b)	i.	Define IDS and its functioning mechanism.	8	K3	CO5
	ii.	Analyze the importance of IDS in Information Security.	5	K3	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	i. Give a detail blueprint for Information Security with its different Security Policies and Standards.	10	K2	CO4
	ii. Give a proper illustration to support your answer (i).	5	K4	
(OR)				
b)	i. Demonstrate in details the Risk Management for Information Security.	10	K2	CO3
	ii. With an example describe the steps for Identifying, Assessing and Controlling Risk.	5	K4	



Reg.No.:

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Question Paper Code: 5001

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – April / May 2023

Eighth Semester

Computer Science and Engineering

U19CSE20 – TOTAL QUALITY MANAGEMENT

(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	List the dimensions of product and service quality	2	K2	CO1
2.	What is customer satisfaction?	2	K1	CO1
3.	Define performance appraisal	2	K3	CO2
4.	Define employee involvement. Write the significance of it in TQM.	2	K5	CO2
5.	List the seven traditional tools of quality	2	K2	CO3
6.	Write short note on Six sigma	2	K2	CO3
7.	What are Control Charts?	2	K1	CO4
8.	Define Quality Function Development (QFD)	2	K2	CO4
9.	What is QS 9000 ISO certification?	2	K1	CO5
10.	What is Quality Auditing?	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	i. Describe Deming's philosophy for quality management in detail	5		
	ii. Differentiate between Quality in Products and Quality in service	8	K2	CO1
	(OR)			
b)	i. Explain the common customer feedback collection tools.	7	K2	CO1
	ii. List out the 14 steps involved in Crosby's total quality approach	6		
12. a)	What is Continuous process improvement? Explain PDCA cycle in detail.	13	K3	CO2
	(OR)			
b)	Discuss the partnering in TQM. Write the significance of supplier selection and supplier rating	13	K3	CO2
13. a)	Discuss the types of New management tools in detail	13	K2	CO3
	(OR)			
b)	What is Benchmarking? What are the three types of benchmark in quality control	13	K1	CO3
14. a)	Give example of your choice and explain the process of TPM.	13	K3	CO4
	(OR)			
b)	Explain different performance measures with examples.	13	K4	CO4
15. a)	Explain Concepts, Requirements and Benefits of ISO 14000.	13	K5	CO5
	(OR)			
b)	Discuss the importance of ISO 9000.	13	K3	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	If you are appointed as quality control manager of a manufacturing organization of your choice, how you will create quality culture?	15	K6	CO5
	(OR)			
b)	Discuss the significance of TQM Implementation in manufacturing and service sectors with suitable example.	15	K6	CO5

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Question Paper Code: 5004

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – May 2023

Sixth Semester

Computer Science and Engineering

U19CS625 – CLOUD COMPUTING

(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Differentiate between Cloud Computing and Distributed Computing.	2	K2	CO1
2.	What is a cloud ecosystem?	2	K1	CO1
3.	Interpret OS level virtualization in cloud computing.	2	K3	CO2
4.	What is a Virtual Private Cloud (VPC)?	2	K1	CO2
5.	List down the major design goals of a cloud computing platform.	2	K1	CO3
6.	Distinguish between demand driven and event-driven resource provisioning.	2	K2	CO3
7.	Illustrate borrowed virtual-time scheduling in cloud computing.	2	K2	CO4
8.	Mention the key features of Amazon Simple Storage Service (S3).	2	K1	CO4
9.	List the cloud security risks and challenges that every company faces when embracing the cloud.	2	K1	CO5
10.	Demonstrate Virtual Machine Security in Cloud Computing.	2	K3	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	Explain NIST cloud computing reference architecture with a neat schematic diagram.	13	K2	CO1

(OR)

	b)	Explain the following cloud computing service models:	13	K2	CO1
		i. Infrastructure As A Service (IAAS)			
		ii. Platform As A Service (PAAS)			
		iii. Software As A Service (SAAS)			
12.	a)	Analyze and explain virtualization ranging from hardware to applications in five abstraction levels.	13	K4	CO2
		(OR)			
	b)	Demonstrate virtualization of CPU, memory and I/O devices.	13	K3	CO2
13.	a)	Examine layered architectural development of the cloud platform for IaaS, PaaS and SaaS applications over the internet.	13	K3	CO3
		(OR)			
	b)	Assess in detail, the challenges in cloud architecture development.	13	K5	CO3
14.	a)	Evaluate MapReduce scheduling for deadline constrained jobs.	13	K5	CO4
		(OR)			
	b)	i. Design the architecture of Google File System (GFS).	3		
		ii. Explain data mutation in GFS with a neat diagram.	10	K6	CO4
15.	a)	i. Analyze the importance of Identity Management and Access Control (IAM).	6		
		ii. How to mitigate risk with IAM?	7	K4	CO5
		(OR)			
	b)	i. Assess the key objectives for Cloud Security Governance and justify why Cloud Security Governance is needed?	8		
		ii. Elaborate the Cloud Security Governance challenges.	5	K5	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.	Questions	Marks	KL	CO
16.	a) Consider two cloud service systems: Google File System and Amazon S3. Investigate how they achieve their design goals to secure data integrity and to maintain data consistency while facing the problems of hardware failure, especially concurrent hardware failures.	15	K6	CO4
	(OR)			
	b) Compare public clouds and private clouds in each of the following four aspects. Also identify their differences, advantages, and shortcomings in terms of design technologies and application flexibility.	15	K4	CO1
	i. Technology leveraging and IT resource ownership.			
	ii. Provisioning methods of resources including data and VMs, and their management.			
	iii. Workload distribution methods and loading policies.			
	iv. Security precautions and data privacy enforcement.			

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Question Paper Code: 9013

B.E. / B.Tech DEGREE END-SEMESTER EXAMINATIONS – May 2023

Sixth Semester

Computer Science and Engineering

U19BTOE6 – WASTE MANAGEMENT

(Regulation 2019)

(Common to Electrical and Electronics Engineering, Electronics and Communication Engineering, Information Technology and Biomedical Engineering)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	State few human components in waste management.	2	K1	CO1
2.	Identify the way with which waste management is linked socially.	2	K2	CO1
3.	List any FOUR major components present in hospital waste.	2	K1	CO2
4.	State any FOUR major advantages of land filling methods.	2	K1	CO2
5.	Indicate the major constituents of biomedical waste.	2	K3	CO3
6.	What is hazardous waste? Give any two examples.	2	K1	CO3
7.	Infer the major components of E waste.	2	K2	CO4
8.	Classify the plastic waste based on types.	2	K2	CO4
9.	State the importance of re-use of waste.	2	K2	CO5
10.	Quote any four advantages of recycling of waste.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	Classify the different waste handling equipments and explain in detail.	13	K2	CO1
	(OR)			
b)	Explain the steps involved in a waste management logistics process.	13	K2	CO1
12. a)	Exemplify the methods of segregating different types of municipal wastes.	13	K2	CO2
	(OR)			
b)	Categorize different treatment methods used for the treatment of vegetable waste and explain each.	13	K3	CO3
13. a)	Narrate the steps involved in the collection of wastes from hospitals and clinics.	13	K3	CO3
	(OR)			
b)	Schematically explain the different treatment methods used to treat and process the wastes from hospitals.	13	K3	CO3
14. a)	Outline the various methods of treating plastic wastes and explain each.	13	K3	CO4
	(OR)			
b)	Enumerate the segregation of different types of E-waste and discuss the different E-waste treatment methods.	13	K3	CO4
15. a)	Portray the process of recycling the Aluminium and Glass and mention the recycling precautions.	13	K2	CO5
	(OR)			
b)	Schematically explain the process of recycling the news paper.	13	K2	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	Analyze the type of solid wastes that can be disposed by landfilling method and elaborate the process with a neat diagram.	15	K5	CO2
	(OR)			
b)	Justify the importance of re-use and recycling of waste with respect to environmental beneficial purposes and discuss in detail.	15	K5	CO5

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Question Paper Code: 6008

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – May 2023

Sixth Semester

Computer Science and Engineering

U19ITOE12 – CYBER FORENSICS

(Regulation 2019)

(Common to Computer Science and Technology)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
		K2 – Understanding	K4 – Analyzing

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	List the ways of securing evidence.	2	K1	CO1
2.	What is computer investigation?	2	K2	CO1
3.	What is contingency planning of image acquisition?	2	K1	CO2
4.	List the methods used for Windows Validation.	2	K1	CO2
5.	What are the steps to review a case?	2	K1	CO3
6.	List the process of securing a crime scene.	2	K1	CO3
7.	What is data hiding?	2	K1	CO4
8.	What are steps to be followed for performing remote acquisition?	2	K1	CO4
9.	How the graph file is recognized?	2	K2	CO5
10.	List 5 techniques used for data compression.	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	Explain the systematic approach of accessing the case.	13	K1	CO1
	(OR)			
b)	Describe the Procedures for Corporate high tech investigation.	13	K1	CO1
12. a)	Summarize the following:	13	K2	CO2
	i. Understanding Storage Formats for Digital Evidence			
	ii. Process of acquiring data with windows XP write protection with USB devices.			
	(OR)			
b)	Write Short notes on validating data acquisitions.	13	K1	CO2
13. a)	Examine the processes involved in preparing for a search and also the seizing procedure for the Digital Evidence.	13	K2	CO3
	(OR)			
b)	Illustrate the Digital Hash technique in detail.	13	K1	CO3
14. a)	Explain in detail about validating and testing Forensics Software.	13	K1	CO4
	(OR)			
b)	Discuss in detail about Computer Forensics Hardware Tools.	13	K1	CO4
15. a)	Describe the process of investigating email crimes and violation.	13	K1	CO5
	(OR)			
b)	Describe in detail about using specialized E-mail Forensics Tools.	13	K1	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	To analyze e-mail evidence, an investigator must be knowledgeable about an e-mail servers internal operations. True or False? Justify your answer with suitable usecases.	15	K6	CO5
	(OR)			
b)	Point out the features of Computer Investigation & also outline the problems and challenges forensic examiners face when preparing and processing investigations, including the ideas and questions they must consider.	15	K3	CO1

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Question Paper Code: 7012

B.E./ B.Tech. DEGREE END-SEMESTER EXAMINATIONS – May 2023

Sixth Semester

Computer Science and Engineering

U19ECO4 – SATELLITE COMMUNICATION

(Regulation 2019)

(Common to Computer Science and Technology)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Define is Kepler's first law.	2	K1	CO1
2.	A satellite is orbiting in the equatorial plane with a period from perigee to perigee of 12 h. Given that the eccentricity is 0.002, calculate the semimajor axis. The earth's equatorial radius is 6378.1414 km.	2	K3	CO1
3.	What is the necessity of altitude control in a satellite? Mention the role of yaw, roll, pitch axes.	2	K2	CO2
4.	What is meant by thermal control in a satellite?	2	K2	CO2
5.	Highlight the significance of multiple access technologies in satellite communication.	2	K2	CO3
6.	What is the basic arrangement for detection of the unique word (UW)?	2	K2	CO3
7.	What are ATM layers?	2	K1	CO4
8.	Draw the TCP/IP satellite link spoofing configuration.	2	K2	CO4
9.	For NTSC analog TV, $Lact = 483$, $L = 525$, a $4/3$ Flfb = 1.19 and $F = 30$. With $K = 0.7$. Calculate the highest video frequency.	2	K3	CO5
10.	List the important features of Radarsat.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	For satellite no. 14452 the NASA prediction bulletin for a certain epoch gives the eccentricity as 9.5981×10^{-3} and the mean anomaly as 204.9779° . The mean motion is 14.2171404 rev/day. Calculate the true anomaly and the magnitude of the radius vector 5 s after epoch. The semi major axis is known to be 7194.9 km.	13	K4	CO1
(OR)				
b)	Derive the expression for antenna look angles.	13	K3	CO1
12. a)	i. Discuss about the satellite control system.	6	K2	
	ii. Draw to scale the uplink and downlink channeling schemes for a 500-MHz-bandwidth C-band satellite, accommodating the full complement of 36-MHz-bandwidth transponders. Assume the use of 4-MHz guard bands.	7	K3	CO2
(OR)				
b)	i. Explain about satellite wideband receiver.	6	K2	CO2
	ii. State the type of satellite antenna normally used to produce a wide beam radiation pattern, providing global coverage. How are spot beams produced?	7	K2	
13. a)	Discuss in detail about FDMA and mention its advantages and disadvantages.	13	K2	CO3
(OR)				
b)	i. Outline the principle behind spectrum spreading and de-spreading and explain how this is used to minimize interference in a CDMA system.	5	K3	CO3
	ii. Obtain the expression for CDMA throughput.	8	K3	
14. a)	i. Describe briefly the difference between an ATM digital cross connect switch, and an ATM switch.	6	K3	CO4
	ii. Discuss in detail about slow start and congestion avoidance phase in TCP connection.	7	K2	
(OR)				
b)	i. Describe the main distinguishing features between satellite relay, satellite access, and satellite interconnect, in connection with ATM over satellite.	7	K2	CO4
	ii. Explain what is meant by split TCP connections and why these might be considered undesirable for Internet use.	6	K3	
15. a)	i. Write brief notes on the advantages and disadvantages of using satellites in LEOs, MEOs, and GEOs for mobile satellite communications.	8	K2	CO5
	ii. Identify the cause for free-space path loss.	5	K3	

(OR)

- b) Describe the operation of a typical VSAT system. State briefly the major applications of VSAT systems. 13 K2 CO5

PART – C

(1 x 15 = 15Marks)

- | Q.No. | Questions | Marks | KL | CO |
|--------|--|-------|----|-----|
| 16. a) | A satellite transponder has a bandwidth of 36 MHz and a saturation EIRP of 27 dBW. The earth-station receiver has a [G/T] of 30 dB/K, and the total link losses are 196 dB. The transponder is accessed by FDMA carriers each of 3-MHz bandwidth, and 6-dB output back off is employed. Calculate the downlink carrier-to-noise ratio for single-carrier operation and the number of carriers which can be accommodated in the FDMA system. Compare this with the number which could be accommodated if no back off were needed. The carrier-to-noise ratio determined for single-carrier operation may be taken as the reference value, and it may be assumed that the uplink noise and intermodulation noise are negligible. | 15 | K3 | CO3 |

(OR)

- b) A DBS home receiver is being installed at a location 60°N, 155°W to receive from a satellite cluster at 157°. Calculate the look angles for the antenna. It is assured that an 18-in. antenna is used and the antenna efficiency being 0.55, and the effect of surface irregularities may be ignored. The system noise temperature is 200 K. The downlink frequency may be taken as 12.5 GHz, the [EIRP] as 55dBW, and the transponder bit rate as 40 Mb/s. Miscellaneous transmission losses may be ignored. Calculate the received clear sky [Eb/N0], and state whether this will make for satisfactory reception. 15 K4 CO4

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Question Paper Code: 5018

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – May 2023

Sixth Semester

Computer Science and Engineering

U19CSE30 – SOFTWARE PROJECT MANAGEMENT

(Regulation 2019)

(Eighth Semester – Additional Course)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	List out the activities covered under software project management	2	K2	CO1
2.	What is meant by blueprint? What are its components?	2	K1	CO1
3.	What is (Internal Rate of Return) IRR? How is it calculated?	2	K3	CO2
4.	What is meant by cost flow forecasting?	2	K2	CO2
5.	What is the significance of a “project risk matrix”? Give an example.	2	K2	CO3
6.	What is the need of creating a precedence network?	2	K2	CO3
7.	Briefly describe various ways to visualize the progress of the project.	2	K2	CO4
8.	Why Project monitoring is important? What is prioritize monitoring?	2	K2	CO4
9.	What is motivation? What are the methods to improve motivation?	2	K2	CO5
10.	How can we improve group decision making?	2	K3	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	Differentiate between role and responsibilities of program managers and project managers.	13	K2	CO1
(OR)				
b)	What are the different considerations that have to be followed for project estimation? State the advantages and disadvantages in LOC based Cost Estimation.	13	K2	CO1

12. a)	Explain the various SDLC activities as outlined by ISO 12207 with a neat diagram.	13	K1	CO2
	(OR)			
b)	With Suitable example explain how Development cost, Setup cost and Operational cost is estimated?	13	K3	CO2
13. a)	With the help of example explain forward pass and backward pass to calculate activity duration in network diagram.	13	K3	CO3
	(OR)			
b)	What is a Product Breakdown Structure (PBS)? Show the hierarchical diagram of sample PBS. Also compare it with Work Breakdown Structure (WBS).	13	K3	CO3
14. a)	What is contract management? Who is responsible for it? Discuss various types of contracts giving their advantages and disadvantages.	13	K2	CO4
	(OR)			
b)	In a multi-customer environment, a configuration librarian is the owner of the configuration library and manager of all master copies of configuration items (CIs) describe his important roles and responsibilities.	13	K2	CO4
15. a)	Discuss the importance of stakeholder management in supporting an organization to achieve its strategic objectives.	13	K2	CO5
	(OR)			
b)	Discuss in detail structured and unstructured decision making? Write some of the mental obstacles to good decision making.	13	K2	CO5

PART – C

Q.No.	Questions	(1 x 15 = 15Marks)		
		Marks	KL	CO
16. a)	Project Evaluation and Review Technique (PERT) and Critical Path Method (CPM) are two project scheduling methods that can be applied to software development. Give a comparative analysis of applying these methods.	15	K3	CO3
	(OR)			
b)	What do you understand by the term ‘ceremonies’ in a scrum project? Explain the different types of ceremonies that are observed in a Scrum project and their significance.	15	K2	CO2

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Question Paper Code: 5017

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – May 2023

Sixth Semester

Computer Science and Engineering

U19CSE29 – SOFTWARE TESTING AND QUALITY ASSURANCE

(Regulation 2019)

(Eighth Semester – Additional Course)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	What is defect detection efficiency? How it is calculated?	2	K1	CO1
2.	Analyze the role of tester in software development organization.	2	K2	CO1
3.	Why code coverage analysis is important in software testing? How it differs from test coverage?	2	K2	CO2
4.	What are the advantages and disadvantages of using COTS software?	2	K2	CO2
5.	Differentiate quality assurance and quality control.	2	K2	CO3
6.	Write major ethical issues in the Software Quality Assurance (SQA).	2	K2	CO3
7.	What is Software Quality Audit? Discuss its various types.	2	K2	CO4
8.	Compare and contrast CMM and CMMI models.	2	K2	CO4
9.	What is the significance of Rayleigh model in software quality improvement?	2	K2	CO5
10.	Why organizational learning is important in software engineering?	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	Enlist any six attributes of defect. Describe them with suitable examples.	13	K3	CO1
	(OR)			
b)	What do you understand by static, dynamic and operational techniques for finding defects?	13	K3	CO1
12. a)	Equivalence Partitioning increase the coverage and reduces the effort involved in software testing. Justify the statement with suitable example.	13	K3	CO2
	(OR)			
b)	Describe Test Management Process and give details of following internal standards for process and method : i. Naming and storage contention. ii. Documentation standard.	13	K3	CO2
13. a)	Describe why testing is part of quality assurance and give examples of how testing contributes to higher quality.	13	K2	CO3
	(OR)			
b)	Discuss how Deming's 14 Points can be used to improve the Quality of software?	13	K2	CO3
14. a)	What are major objectives of software configuration management?	13	K3	CO4
	(OR)			
b)	'Computer Assisted Audit Tools (CAATs) are comparatively better than traditional audits in case of testing specific risk'. Justify the statement by giving a suitable scenario.	13	K3	CO4
15. a)	Explain any four software quality metrics for process and products. How these are helpful for a software engineer?	13	K3	CO5
	(OR)			
b)	How size and structure are used for measuring the product attributes? How the product qualities are ascertained.	13	K2	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	How will you design software metrics to verify the completeness and correctness of software requirements specification (SRS) document? Illustrate with an example.	15	K3	CO5
	(OR)			
b)	Analyze and discuss in detail following models by highlighting their differences: i. McCall Quality model ii. Boehm's Quality model	15	K4	CO5

Reg.No.:

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Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 12005

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – May 2023

Sixth Semester

Computer Science and Engineering

U19BMOE5 – HEALTHCARE MANAGEMENT SYSTEMS

(Regulation 2019)

(Common to Electrical and Electronics Engineering,

Electronics and Communication Engineering & Information Technology)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	(10 x 2 = 20 Marks)		
		Marks	KL	CO
1.	Describe the role of public health services.	2	K1	CO1
2.	Write any four current issues in hospital management.	2	K1	CO1
3.	Give the significance of professional management in hospitals.	2	K2	CO2
4.	List the steps involved in the in the process of recruitment and selection.	2	K2	CO2
5.	Mention the rules being followed in retention of medical records in hospital.	2	K3	CO3
6.	Why do hospitals require a materials management system?	2	K3	CO3
7.	In hospitals, why is sanitation so important?	2	K2	CO4
8.	List the advantages of centralized medical gas system.	2	K2	CO4
9.	How does hospital management define loss prevention?	2	K3	CO5
10.	Write the benefits of alarm systems in hospitals?	2	K3	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	Explain the key guiding principles adapted in hospital planning and designing.	13	K3	CO1
	(OR)			
b)	Elaborate on the process of equipment planning and purchasing of capital equipment in a hospital.	13	K3	CO1
12. a)	Draw the organogram of hospital management system and explain responsibility and accountability of all the departments in the overall functioning of the hospital.	13	K2	CO2
	(OR)			
b)	Describe the different training and evaluation techniques used in hospital human resource development.	13	K4	CO2
13. a)	List the main hospital information system modules and describe their features.	13	K3	CO3
	(OR)			
b)	Explain how hospital administration is carried out in the following areas: i. Outpatient Services ii. Pharmacy services	13	K3	CO3
14. a)	Explain various services offered by clinical engineering department in hospital.	13	K2	CO4
	(OR)			
b)	Indicate the factors need to be considered when designing an Air conditioning system for a hospital? Explain variable refrigerant flow (VRF) systems.	13	K5	CO4
15. a)	What are the major causes of fire accidents in hospitals? Explain various elements in designing an effective hospital fire safety plan.	13	K5	CO5
	(OR)			
b)	Explain in detail about hospital administration during disaster.	13	K3	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	Elaborate the workload and services rendered by engineering department in the hospital.	15	K5	CO4
	(OR)			
b)	Give your perspective of a modern hospital. Describe how electronic health record management can be used effectively in a modern hospital.	15	K5	CO3

Reg.No.:



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Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 5013

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – May 2023

Sixth Semester

Computer Science and Engineering

U19CS627 – INTERNET OF THINGS

(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	List two desirable characteristics of RESTful API with respect to IOT	2	K1	CO1
2.	Is there any global IP broadcast address?	2	K2	CO1
3.	List out atleast five COAP Features	2	K1	CO2
4.	What is the role of Broker in MQTT? Typically, where do we deploy the Broker function in constrained IOT networks?	2	K2	CO2
5.	How is IOT node Registration related to Discovery?	2	K2	CO3
6.	Discuss each command types in command frame of IEEE 802.15.4 device.	2	K1	CO3
7.	How are APIs and libraries related with each other? Explain with a suitable example.	2	K2	CO4
8.	Name two GPIO port on Raspberry Pi that offers Synchronous communication.	2	K2	CO4
9.	What is the relationship among URI, URN, & URL	2	K2	CO5
10.	List out the most important security problems with IoT Devices with clear explanation	2	K3	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	Discuss the following terms in IoT physical design challenges with an appropriate examples. i. Constrained Data Processing ii. Dynamic and Self Adapting iii. Self-Configuring iv. Interoperability	13	K2	CO1
	(OR)			
b)	Explain the potential and benefits of an IoT oriented approach over M2M by considering a Health band as the real world use case example. Compare the main characteristics of M2M and IoT.	13	K2	CO1
12. a)	Discuss the CoAP communication protocol base features and also discuss in detail all four messaging type with sequence diagram.	13	K2	CO2
	(OR)			
b)	Discuss the LWM2M Protocol Architecture, and messaging sequence of different operation between LWM2M client and LWM2M server.	13	K2	CO2
13. a)	Why constrained network requires 6LOWPAN adaptation layer to connect to IPv6 network?	13	K3	CO3
	(OR)			
b)	Compare COAP with MQTT on the following areas: Connectivity options and scalability	13	K3	CO3
14. a)	Write a program to establish a client server communication using python TCP socket library. Servers host the calculator service to their clients. Server sends the service menu (addition, subtraction, multiplication, division) to the connected client, where client send the service number and data input for computation at the server. The computed result server sends at the client console. Server Socket operate at IP : 127.0.0.1 and port 1001.	13	K3	CO4
	(OR)			
b)	Write a program to establish a client server communication using python socket library to send a message contain humidity and temperature data in a string format [h,t] from the client TCP socket to server socket The server store the data into data.txt file and display it on console. Server Socket operate at IP : 127.0.0.1 and port 1001	13	K3	CO4
15. a)	IPv6 address space is much larger than IPv4 address space. That is one of the reasons that IPv6 is a critical component of IoT. However, the IPv6 Header size is larger - by 20 bytes, how can you justify its use in constraint network.	13	K4	CO5

(OR)

- b) We have a fleet of limousines/taxis. Suggest how we can use IOT with MQTT to help improve this business. 13 K4 CO5

PART – C

(1 x 15 = 15Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	When a 6LOWPAN IOT node is powered on, OS instructs the networking layers to SCAN, SELECT, ASSOCIATE, Address REGISTER, and REGISTER. A node can be DISCOVERED only when the above sequence is completed. Explain the entire sequence of discovery and registration through sequence diagram, and explain how is PAN ID related to this Association procedure?	15	K4	CO3

(OR)

- b) Finding parking in urban areas, whether public or private, is an everyday problem. How an IoT solution can contribute to smart detection of parking spots availability in smartcities. Apply IoT design methodology step wise for smart parking system. 15 K4 CO5



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Question Paper Code: 2001

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – May 2023

Fourth Semester

Computer Science and Engineering

U19MA405 – STATISTICS AND NUMERICAL METHODS

(Regulation 2019)

(Common to Computer Science and Technology and Information Technology)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO										
1.	Define an unbiased estimator with an example.	2	K1	CO1										
2.	Define Type I and Type II.	2	K1	CO1										
3.	What is the difference between one way classification and two way classification of analysis of variance?	2	K2	CO2										
4.	Is 2x2 Latin square Design possible? Why?	2	K2	CO2										
5.	Explain graphical interpretations of Newton-Rapson method.	2	K3	CO3										
6.	How to find eigenvalues of a matrix by Jacobi's method?	2	K2	CO3										
7.	What you mean by interpolation?	2	K3	CO3										
8.	Given the data in the following table, estimate the value of Sin (52) using Newton's forward difference interpolation Formula.	2	K3	CO4										
<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>θ^0</td> <td>45</td> <td>50</td> <td>55</td> <td>60</td> </tr> <tr> <td>$\text{Sin}\theta^0$</td> <td>0.7071</td> <td>0.7660</td> <td>0.8192</td> <td>0.8660</td> </tr> </table>					θ^0	45	50	55	60	$\text{Sin}\theta^0$	0.7071	0.7660	0.8192	0.8660
θ^0	45	50	55	60										
$\text{Sin}\theta^0$	0.7071	0.7660	0.8192	0.8660										
9.	Explain an Euler's method for solving an ordinary differential equation with given initial conditions.	2	K2	CO4										
10.	Given the initial value problem $u' = -2tu^2$, $u(0) = 1$, estimate $u(0.4)$ using modified Euler's method.	2	K3	CO5										

PART – B

(5 x 16 = 80 Marks)

- | Q.No. | Questions | Marks | KL | CO |
|--------|--|-------|----|-----|
| 11. a) | <p>i. A company claims that its light bulbs are superior to those of its main competitor. If study showed that a sample of $n_1 = 40$ of its bulbs had a mean life of 647 hours of continuous use with a standard deviation of 27 hours, while that a sample of $n_2 = 40$ bulbs made by its main competitor had a mean life of 638 hours of continuous use with standard deviation of 31 hours, does this substantiate the claim at the 5% level of significance?</p> <p>ii. The following are the distribution of the daily number of power failures in a certain city for 300 days.</p> | 8 | K2 | CO2 |

No. of days failures	0	1	2	3	4	5	6	7	8	9	10
No. of days observed	9	43	63	62	42	36	22	14	6	2	1

Test at the 5% level of significance whether the daily number of power failures in the city is a random variable having the Poisson distribution with parameter λ .

(OR)

- | | | | | |
|----|--|---|----|-----|
| b) | <p>i. Two random samples drawn from two normal populations are:</p> <p>Sample I: 20 16 26 27 23 22 18 24 25 19</p> <p>Sample II: 27 33 42 35 32 34 38 28 41 43 30 37</p> <p>Can they be regarded as drawn from two normal distributions with the same variance?</p> <p>ii. The number of taxis waiting at a cab stand is thought to follow a uniform distribution. The number present was recorded at 50 random times:</p> | 8 | K3 | CO2 |
|----|--|---|----|-----|

Number of taxis	0	1	2	3	4	5	6	7	8
Frequency	4	6	8	5	7	6	6	5	3

Estimate the two parameters of the uniform distribution, and thus use the appropriate goodness of fit test to determine if the uniform distribution is a good choice at the 5% significance level.

12. a) i. The following data represent the number of units of productions/day turned out by 5 different workmen using 4 different types of machines. Use the level of significance $\alpha = 5\%$.

8 K1 CO1
K2 CO2

		Machines			
		M ₁	M ₂	M ₃	M ₄
Workmen	W ₁	45	39	47	36
	W ₂	46	40	52	43
	W ₃	34	37	44	33
	W ₄	33	38	47	36
	W ₅	32	45	33	40

- 1) Test whether mean productivity is the same for 4 different type of machine.
- 2) Test whether 5 men differ with respect to mean productivity.

- ii. A Latin- square design was used to compare the bond strength of gold semiconductor lead wires bonded to the lead terminal by five different methods, A, B, C, D and E. The bonds were made by five different operators, and the devices were encapsulated using five different plastics. With the following results, expressed as pounds of force required for breaking the bond, analyze the data at 5% level of significance and draw appropriate conclusions.

8 K1 CO1
K2 CO2

Operators →	O1	O2	O3	O4	O5
Plastics ↓					
P1	A 3.0	B 2.4	C 1.9	D 2.2	E 1.7
P2	B 2.1	C 2.7	D 2.3	E 2.5	A 3.1
P3	C 2.1	D 2.6	E 2.5	A 2.9	B 2.1
P4	D 2.0	E 2.5	A 3.2	B 2.5	C 2.2
P5	E 2.1	A 3.6	B 2.4	C 2.4	D 2.1

(OR)

- b) i. A safety engineer is testing 4 different types of smoke alarm systems. After installing 5 of each type in a smoke chamber, he introduced smoke to uniform level, electrically connected the alarms, and observed the reaction time in seconds. Is there a significant difference in the reaction time of the 4 types? 8 K1 CO1

Observations	Alarm type			
	1	2	3	4
1	5.2	7.4	3.9	12.3
2	6.3	8.1	6.4	9.4
3	4.9	5.9	7.9	7.8
4	3.2	6.5	9.2	10.8
5	6.8	4.9	4.1	8.5

- ii. The following are the weight losses of certain machine part in (milligrams) due to friction, when three different lubricants were used under controlled conditions

Lubricant A : 12.2 11.8 13.1 11.0 3.9 4.1 10.3 8.4

Lubricant B : 10.9 5.7 13.5 9.4 11.4 15.7 10.8 14.0

Lubricant C : 12.7 19.9 13.6 11.7 18.3 14.3 22.8 20.4

Test at the 0.01 level of significance whether the differences among the sample mean can be attributed to chance.

8 K2 CO2

13. a) i. Solve the following system of equations by using Gauss elimination method. 8 K1 CO3

$$9x_1 + 3x_2 + 4x_3 = 7$$

$$4x_1 + 3x_2 + 4x_3 = 8$$

$$x_1 + x_2 + x_3 = 3$$

- ii. Solve the following system of equations by using Gauss Jordan method. 8 K3 CO3

$$2x + 3y - 4z = 5$$

$$3x + 4y - 5z = -6$$

$$4x + 5y - 6z = 7$$

(OR)

- b) i. Solve the following system of equations by using Gauss Seidel method. 8 K1 CO3

$$x - y + z = 8$$

$$2x + 3y - z = -2$$

$$3x - 2y - 9z = 9$$

- ii. Use power method to find the dominant Eigenvalue and 8 K3 CO3

Eigenvector of the matrix $\begin{pmatrix} 9 & 1 & 8 \\ 7 & 4 & 1 \\ 1 & 7 & 9 \end{pmatrix}$.

14. a) i. Using Newton's divided difference formula, find $u(3)$ given $u(1) = -26$, $u(2) = 12$, $u(4) = 256$, $u(6) = 844$ 8 K1 CO3

- ii. Apply Trapezoidal rule to evaluate using 8 intervals of equal length, and compare with the exact solution. 8 K3 CO4

$$\int_{-1}^1 \frac{1}{1+x^2} dx$$

(OR)

- b) i. Find the first two derivatives of $f(x)$ at $x=1.1$ by using the data given in the following table. 8 K3 CO4

x	1.0	1.1	1.2	1.3	1.4	1.5	1.6
f(x)	7.989	8.403	8.781	9.129	9.451	9.750	10.031

- ii. The velocity v of a particle is at a distance s from a point on its path is given by the following data presented in the table. 8 K3 CO4

s	0	10	20	30	40	50	60
v	47	58	64	65	61	52	38

Estimate the time taken by the particle to travel 60 meters by using Simpson's 1/3 rule.

15. a) i. Given that $y'' + xy' + y = 0$, $y(0) = 1$; $y'(0) = 0$, obtain the value of y for $x = 0.1, 0.2$ by using Taylor series method. 8 K1 CO5

- ii. Given $\frac{dy}{dx} = xy + y^2$, $y(0) = 1$, $y(0.1) = 1.1169$ 8 K3

$$y(0.2) = 1.2773, \text{ Find}$$

1. $y(0.3)$ by Runge-kutta method of 4th order.

2. $y(0.4)$ by Milne's method.

(OR)

- b) i. Find $y(0.7)$ and $y(0.8)$ given that $y' = y - x^2$, $y(0.6) = 1.7379$, by using 4th order Runge-Kutta method. Take $h=0.1$. 8 K2 CO5

- ii. Use Adams method find $y(1.4)$ given $y' = x^2(1+y)$, $y(1) = 1$, $y(1.1) = 1.233$, $y(1.2) = 1.548$ and $y(1.3) = 1.979$. 8 K3 CO5

Reg.No.:



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Question Paper Code: 5005

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – May 2023

Fourth Semester

Computer Science and Engineering

U19CS410 – COMPUTER ORGANIZATION

(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
		K2 – Understanding	K4 – Analyzing

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	K2	CO
1.	What does the control lines do in Bus Structure?	2	K1	CO1
2.	What is Immediate addressing Mode?	2	K1	CO1
3.	Define Control Word.	2	K4	CO2
4.	Write down the disadvantage of Nano Programming.	2	K1	CO2
5.	What is Pipelining?	2	K1	CO3
6.	What is branch hazards?	2	K2	CO3
7.	What do you mean by a cache hit and cache miss?	2	K4	CO4
8.	How PROM Works?	2	K4	CO4
9.	Write down two advantages of USB.	2	K1	CO5
10.	What is programmed I/O	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	i. What is the difference between Synchronous Bus & Asynchronous Bus?	6	K1	CO1
	ii. Describe each and every steps of Instruction Execution.	7	K3	
	(OR)			
b)	i. Discuss the various addressing modes used in microprocessors with example. Also write down the advantages of addressing mode.	8	K2	CO1
	ii. Write down the characteristics of RISC And CISC Processors.	5	K4	

12.	a)	i.	What is Instruction cycle? Explain the 6 steps of instruction execution by CPU.	6.5	K1	CO2
		ii.	Explain Nano Programming. Why we need Nano Programming?	6.5	K3	
			(OR)			
	b)	i.	Briefly discuss on multiple Bus Organization and how does it differ from Single Bus Organization.	7	K2	CO2
		ii.	Differentiate between Hardwired control and multi programmed control unit.	6	K2	
13.	a)	i.	Briefly State about Instruction Pipelining & Arithmetic Pipelining. What is the advantage of pipelining?	7	K1	CO3
		ii.	What are the various types of Data hazards? Explain the methods to handle data hazards.	6	K2	
			(OR)			
	b)	i.	How is exception handling used? What are the types of exceptions?	8	K2	CO3
		ii.	What is the function of Data path and control? What are the limitations of single cycle data path?	5	K2	
14.	a)	i.	What is Memory Hierarchy? Draw the diagram for memory hierarchy starting from Level 0 and describe each level. Why memory hierarchy is used in systems?	2+5+3	K3	CO4
		ii.	Explain Virtual memory and how it works.	3	K3	
			(OR)			
	b)	i.	Write short note on 1. Direct Mapping, 2. Associative Mapping & 3. Set-Associative Mapping	9	K1	CO4
		ii.	Differentiate between SRAM & DRAM.	4	K4	
15.	a)	i.	How many registers are there in a DMA controller? Draw the block diagram of the DMA controller and explain the working.	8	K2	CO5
		ii.	Explain various ports used in I/O Interface circuit.	5	K4	
			(OR)			
	b)	i.	Explain the Architecture of PCI & SCSI with diagram.	10	K2	CO5
		ii.	Write down the functions of input-output interface.	3	K2	

PART – C

(1 x 15 = 15Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	<p>i. In a k-way set associative cache, the cache is divided into v sets, each of which consists of k lines. The lines of a set placed in sequence one after another. The lines in set s are sequenced before the lines in set (s+1). The main memory blocks are numbered 0 on wards. The main memory block numbered 'j' must be mapped to any one of the following cache lines select the correct option.</p> <ol style="list-style-type: none"> 1. $(j \bmod v) \times k$ to $(j \bmod v) \times k + (k - 1)$ 2. $(j \bmod v)$ to $(j \bmod v) + (k - 1)$ 3. $(j \bmod k)$ to $(j \bmod k) + (v - 1)$ 4. $(j \bmod k) \times v$ to $(j \bmod k) \times v + (v - 1)$ 	8	K5	CO4
	<p>ii. Write short note on instructions and instruction sequencing.</p> <p style="text-align: center;">(OR)</p>	7	K1	CO1
b)	<p>i. Consider a pipeline having 4 phases with duration 60, 50, 90 and 80 ns. Given latch delay is 10 ns. Calculate-</p> <ol style="list-style-type: none"> 1. Pipeline cycle time 2. Non-pipeline execution time 3. Speed up ratio 4. Pipeline time for 1000 tasks 5. Sequential time for 1000 tasks 6. Throughput 	12	K4	CO3
	<p>ii. Differentiate between L1 Cache and L2 cache.</p>	3	K2	CO4

Reg.No.:



VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN

[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]

Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 5009

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – May 2023

Fourth Semester

Computer Science and Engineering

U19CS414 – WEB TECHNOLOGY

(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 – Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Tell the purpose of the HTML <head> tag?	2	K1	CO1
2.	What are relative URLs in HTML and XHTML?	2	K1	CO1
3.	How are style sheets linked to HTML documents?	2	K2	CO2
4.	How do you define a function in JavaScript?	2	K1	CO2
5.	Show the life cycle of a servlet.	2	K2	CO3
6.	How do you prevent the default behavior of an HTML element in response to an event using JavaScript?	2	K2	CO3
7.	What is XSLT transformation in XML?	2	K1	CO4
8.	How do you perform a SAX parsing in Java?	2	K1	CO4
9.	Illustrate how to handle an AJAX response using JavaScript.	2	K2	CO5
10.	What is the purpose of the “<canvas>” element in HTML 5.0?	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	i. Explain the purpose and way of creating lists in HTML documents.	6	K2	CO1
	ii. Explain the capabilities of web client and web server.	7	K2	
(OR)				
b)	Explain HTML forms in detail along with form elements, attributes and methods. Write an HTML document to provide a form that collect name and telephone numbers.	13	K2	CO1

12.	a)	List and describe the CSS Border Style Properties in detail with illustration.	13	K1	CO2
(OR)					
	b)	Discuss in detail about JavaScript variables and operators.	13	K6	CO2
13.	a)	i. Explain the use of document tree with an example.	6	K2	CO3
		ii. Outline the DOM event handling in detail.	7	K2	CO3
(OR)					
	b)	Describe the Servlet operation in detail with a sample Servlet program.	13	K2	CO3
14.	a)	Organize the concept of XML schema, built-in and user-defined data types in detail.	13	K3	CO4
(OR)					
	b)	Assess the role of JDBC in JSP with an example.	13	K5	CO4
15.	a)	i. What is HTML5, and how is it different from previous versions of HTML?	7	K1	CO5
		ii. Explain the role of HTML5 in web application development.	6	K5	
(OR)					
	b)	How can you implement AJAX in a web page? Explain with an example.	13	K3	CO5

PART – C

(1 x 15 = 15Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	Develop an interactive web page for student registration using HTML form elements.	15	K6	CO1
(OR)				
b)	Get the students' details like name, register number and mark using form. Generate DTD for this XML document.	15	K3	CO4
	Name Regno Mark			
	XYZ 1000 90			
	ABC 1001 80			
	RST 1002 89			
	PQR 1003 87			
	Generate the collected information in the descending order of marks using XSLT. Results should be displayed in the above format. Write a source code and explain the same.			

Reg.No.:



VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN

[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]

Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 5015

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – May 2023

Fourth Semester

Computer Science and Engineering

U19CS412 – OPEN SOURCE SOFTWARE

(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	What happens when you use the following commands: i. ls ii. pwd	2	K1	CO1
2.	List any four good FOSS coding practices.	2	K2	CO1
3.	What is type casting in PHP?	2	K1	CO2
4.	Give the syntax for Viewing arrays in PHP with example.	2	K2	CO2
5.	What is "mysqld"?	2	K1	CO3
6.	Why do so many organizations use MySQL?	2	K2	CO3
7.	Write a Perl program to read a string and a number n and prints string n times	2	K3	CO4
8.	Write a Perl script to read radius of circle and compute area and circumference.	2	K3	CO4
9.	Why is the POST method more secure as compared to the GET method?	2	K2	CO5
10.	What is meant by Data Manipulation? Give an example for Perl Data Manipulation operations.	2	K1	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11.	a) i. Explain the licensing schemes of software.	7	K2	CO1
	ii. Outline the hierarchy of the structure of the directories in Unix/Linux.	6	K3	CO1
(OR)				
	b) i. What is Open Source Software (OSS)? How it is useful to Small Business?	7	K2	CO1
	ii. Identify the differences between User mode and Kernel mode of Linux operating system.	6	K2	CO1
12.	a) i. Build a PHP script to accept String, Font name and draw vertical string in user specified font.	7	K3	CO2
	ii. Discuss the File handling and Data storage in PHP.	6	K6	CO2
(OR)				
	b) i. Develop a PHP function that checks whether a passed string is palindrome or not?	7	K3	CO2
	ii. Explain five string handling functions in PHP?	6	K2	CO2
13.	a) i. Discuss how meta data is handling in MySQL?	5	K1	CO3
	ii. Explain the following: 1) Sorting Query Results in MYSQL 2) Record selection Technology 3) MySQL Group By Clause 4) IN and BETWEEN Clause	8	K3	CO3
(OR)				
	b) Illustrate how to create database and process SQL queries with examples	13	K2	CO3
14.	a) i. What is Perl? Explain various types of variables available in Perl.	7	K1	CO4
	ii. Outline how to pass arguments to the Subroutine.	6	K2	CO4
(OR)				
	b) i. Explain PERL control structures with examples.	9	K1	CO4
	ii. Write a simple Perl program to handle a spread sheet of 12 columns and 100 rows and simply print all items of 5th column. Assume that the spread sheet is saved as a CSV file.	4	K6	CO4
15.	a) i. What is a cookie? Write one application using cookies.	6	K1	CO5
	ii. Write CGI script for uploading the selected file.	7	K6	CO5
(OR)				

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|----|-----|--|---|----|-----|
| b) | i. | Write a Perl subroutine that takes a text string as input parameter and returns the frequency of occurrences of various words in the text. | 6 | K3 | CO5 |
| | ii. | Develop a Perl program that reads a file containing city and country as records and creates a hash of arrays containing countries as key and cities as values. For example for the input {Delhi: India, Hyderabad: India, New York: USA, Chicago: USA}, the program is required to create hash table {India: [Delhi, Hyderabad], USA: [New York, Chicago]} | 7 | K6 | CO5 |

PART – C

(1 x 15 = 15 Marks)

Q.No.	Questions	Marks	KL	CO
16	a) Explain the process management in Linux with an emphasis towards the role of kernel with a neat diagram. (OR)	15	K3	CO1
	b) Develop a perl program to create a database for student information system and how to access the database. (Assume your own data of a student).	15	K6	CO5

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 [AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
 Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 5014

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – May 2023

Fourth Semester

Computer Science and Engineering

U19CS413 – OPERATING SYSTEMS

(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	List the various operating system components?	2	K1	CO1
2.	Recall the need of process control block.	2	K1	CO1
3.	Compare preemptive and non-preemptive scheduling.	2	K2	CO2
4.	Define race condition.	2	K1	CO2
5.	Give two hardware instructions and their definitions which can be used for implementing mutual exclusion.	2	K1	CO3
6.	Infer the use of resource-allocation graph?	2	K2	CO3
7.	What is demand paging?	2	K1	CO4
8.	Define thrashing.	2	K1	CO4
9.	List the various file attributes.	2	K1	CO5
10.	Identify the structures used in file-system implementation.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	A program needs to read a file named "data.txt" and output the contents to the console. The program is written in C and needs to use system calls to accomplish this task. Write a code snippet that demonstrates how the program can use system calls to read the file and output the contents.	13	K3	CO1

(OR)

b) Organize the function of interprocess communication in detail. 13 K3 CO1

12. a) Consider a CPU that needs to execute five processes, P1, P2, P3, P4, and P5. The arrival times and CPU burst times for each process are given in the table below:

Process	Arrival Time	CPU Burst Time
P1	0	3
P2	2	6
P3	4	4
P4	6	2
P5	8	5

Assume that the CPU uses three scheduling algorithms: Round Robin (RR) with a time quantum of 2 milliseconds, Shortest Job First (SJF), and Priority scheduling with priorities in the range of 1 (highest priority) to 5 (lowest priority).

- i. Using the RR and SJF algorithm, what is the order in which the processes will be executed? 8 K3 CO2
- ii. Using the Priority scheduling algorithm, with priority 1 being the highest priority and priority 5 being the lowest priority, what is the order in which the processes will be executed? 5

(OR)

b) Analyze the concept of process synchronization and how to solve critical-section problem. 13 K4 CO2

13. a) A modern restaurant employs three people, namely Alex, Sandy and Mahi to make burger. They share a cutting board, two griddle pan and a meat grinder.

Alex needs to use one griddle pan and one meat grinder.

Sandy must use one griddle pan and one cutting board.

Mahi needs to use one griddle pan, one cutting board and one meat grinder.

After a certain time, Alex is using one meat grinder. Sandy is not using anything and Mahi is using one griddle pan and one cutting board.

- i. Draw a resource allocation graph to show the state of system (show future claims as dash lines) and draw a table to illustrate maximum, used, needed and available resources in system 6 K3 CO3
- ii. Find out whether the system is in a safe state or not. If it is in safe state, gives the safe sequence. If not identify the resources involved in the resulting deadlock. 7

(OR)

- b) Explain how to perform paging and segmentation with necessary diagrams 13 K2 CO3
14. a) i. Consider a disk with 200 tracks and a request queue of 15 I/O requests with the following track numbers: 50, 75, 25, 100, 175, 125, 150, 125, 75, 50, 25, 0, 10, 5, 15. Use the SSTF disk scheduling algorithm to determine the total head movement. 7 K3 CO4
- ii. Consider a disk with 300 tracks and a request queue of 20 I/O requests with the following track numbers: 100, 150, 200, 250, 100, 50, 25, 0, 175, 200, 250, 275, 290, 295, 290, 285, 280, 270, 260, 250. Use the SCAN and C-SCAN disk scheduling algorithm (moving towards the increasing track numbers) to determine the total head movement. Assume that the initial head position is at track 120. 6

(OR)

- b) Consider a system with 4 frames and the following page reference string: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. Determine the number of page faults using FIFO, LRU and Optimal algorithms. 13 K5 CO4
15. a) i. A file system uses the two-level directory structure, where each user has a directory and all user directories are stored in a single directory. If each user has an average of 10 files, each with an average size of 1KB, and the file system has a block size of 4KB, how many user directories can be stored in a single block? 6 K3 CO5
- ii. A file system uses the indexed allocation method, where a block of pointers is used to store the addresses of the data blocks. If each block can store 256 pointers and the file system has a block size of 1KB, what is the maximum file size that can be stored in this file system? 7

(OR)

- b) Compare the features of file allocation methods . 13 K5 CO5



PART – C

(1 x 15 = 15Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	Consider a packet delivery network that uses routers for data packet transmission. A router will transmit the data packets in the order which they are arriving. Once the packet enters the router data transmission it will not interrupt due to any reasons. After a data packet is transmitted completely only, the next data packet enters the router for transmission. Assume that all the data packets have arrived at the router at 0ms. Calculate the average waiting time of the data packets if they arrive in the following order: i. DP1, DP2, DP3 ii. DP2, DP3, DP1 iii. DP3, DP1, DP2	15	K4	CO2

Show that which order of the data packets transmitted in the router have a minimum average waiting time. Calculate the average turnaround time taken by the packets for transmission. The number of data packets and their size is given below

Data Packets	Packet size (KB)
DP1	20
DP2	7
DP3	5

Note: Apply the appropriate scheduling algorithm for the above scenario given.

(OR)

b)	Illustrate how to perform deadlock avoidance with an example	15	K2	CO3
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Question Paper Code: 5012

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – May 2023

Fourth Semester

Computer Science and Engineering

U19CS411 – DESIGN AND ANALYSIS OF ALGORITHMS

(Regulation 2019)

(Common to Computer Science and Technology)

Time: Three Hours

Maximum: 100 Marks

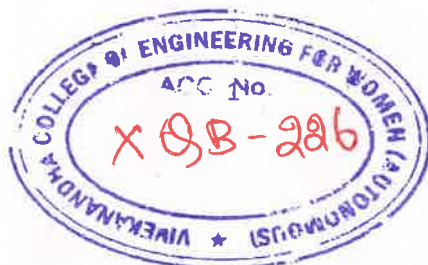
Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

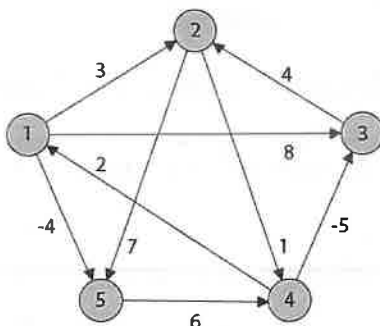
Q.No.	Questions	Marks	KL	CO
1.	Express the following functions in terms of big Theta(Θ) notation $f(n) = 6n + 8 \log^{100} n$	2	K2	CO1
2.	Reorder the following complexity from smallest to largest. Justify your answer $n \log n, (\log n)^3, 2^n, \log n$	2	K2	CO1
3.	Find out the worst-case efficiency of Binary Search. Express it using asymptotic notation.	2	K3	CO2
4.	Is the running time of quick sort depends on the values of the keys in the input file? Justify your answer	2	K2	CO1
5.	What are the basic characteristics of Dynamic Programming Method?	2	K2	CO3
6.	State the differences between Greedy and Divide and Conquer Approach.	2	K2	CO2
7.	What are the constraints of Backtracking approach?	2	K1	CO4
8.	Is Hamiltonian graph a Eulerian graph? Justify.	2	K2	CO4
9.	What is the relation between NP Hard and NP Complete Problem?	2	K2	CO5
10.	Is $P=NP$? Justify your answer	2	K2	CO5



PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	i. Find the solution for the recurrence using Iteration Method $T(n) = n^3 + 2(T(n/2))$	7		
	ii. Establish the relationship between O and Ω .	6	K2	CO1
(OR)				
b)	i. Using recursion tree method, solve the following recurrence $T(n) = 3T(n/4) + n^2$ where $T(1) = 1$	7		
	ii. Express the following function in terms of Big Oh (O) notation $f(n) = 7n^3 + 1000n \log n + 3n$	6	K3	CO1
12. a)	Find the long integer multiplications of 110010 and 101001 using Divide and Conquer approach	13	K3	CO2
(OR)				
b)	i. Derive the Time complexity of Fractional Knapsack Problem.	5		
	ii. Find the optimal solution for the Fractional Knapsack problem given as: $I = \{I_1, I_2, I_3, I_4, I_5\}$, $w = \{5, 10, 20, 30, 40\}$, $v = \{30, 20, 100, 90, 160\}$. The Knapsack capacity, $W = 60$.	8	K3	CO2
13. a)	Apply Floyd-Warshall algorithm for constructing the shortest path.	13	K3	CO3



(OR)

b)	What is the time complexity of Binary Knapsack Problem?	13	K3	CO3
	A thief enters a house for robbing. He can carry a maximum weight of 8 kg into his bag. There are 4 items with the following weights and profits. What items should the thief take if he can either take the item completely or not with the maximum profit Weight: {3,4,6,5} Profits: {2,3,1,4}			
14. a)	Derive the time complexity of 8 Queen Problem using Backtracking approach	13	K4	CO4

(OR)

- b) Given n jobs and n persons, and cost of person i doing job j , find the best job assignment using Branch and Bound Technique. 13 K3 CO4

Job 1	Job 2	Job 3	Job 4	
12	3	6	7	Person W
9	4	3	7	Person X
5	8	2	9	Person Y
7	6	9	4	Person Z

15. a) i. Knapsack Problem with Knapsack Capacity C and n items, can be solved in time $O(nC)$. Again it is NP complete. Is there any contradiction? Explain. 6 K5 CO5
- ii. Show that the Hamiltonian cycle problem for undirected graphs, is NP complete. 7
- (OR)
- b) i. Find a shortest simple path between two vertices p and q in a graph with negative weights is NP complete. 7 K4 CO5
- ii. Discuss the relationship between the classes P and NP with suitable examples. 6

PART – C

(1 x 15 = 15Marks)

- | Q.No. | Questions | Marks | KL | CO |
|-----------|---|-------|----|-----|
| 16. a) i. | If $f(n) = a_m n^m + a_{m-1} n^{m-1} + \dots + a_1 n + a_0$ where $a_m \neq 0$ and $a_i \in \mathbb{R}$, then show that $f(n) = \Omega(n^m)$. | 6 | K3 | CO1 |
| ii. | Illustrate Big Oh, Omega and Theta asymptotic notations graphically and explain. | 9 | | |
| (OR) | | | | |
| b) | Discuss the procedure of multistage graph and analyze the time complexity. Consider the following multistage graph and analyze the cost at each step. | 15 | K4 | CO3 |

