H.T No: | | | | | | | | | | | **R18** **Course Code: A30514**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: COMPUTER NETWORKS

(Common for CSE, IT & CSM)

Date: 05.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Compare guided and unguided transmission media. 2 M
2. Outline a few application areas of computer networks. 2 M
3. Contrast error correction and error detection techniques. 2 M
4. Name the OSI layers in which repeater, hub, router and a switch work. 2 M
5. Recall the role played by ICANN in networks. 2 M
6. State the optimality principle. 2 M
7. List any two application layer protocols that use UDP. 2 M
8. List the three timers used by TCP. 2 M
9. State an authoritative record in DNS. 2 M
10. Summarize the role played by the user agent in E-mail. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Differentiate between OSI and TCP/IP by drawing both reference models. 10M

OR

11. B). Illustrate simplex, half-duplex and full-duplex modes of transmission. Compare the three types of guided transmission media. 10M

12. A). Interpret how CSMA/CD protocol improves efficiency. Draw IEEE 802.3 frame format labelling the fields present. 10M

OR

12. B). Illustrate working of Go-Back-N and Selective Repeat sliding window protocols with an example. 10M

13. A). Outline the impact of congestion on network efficiency. Explain how congestion control is handled at network layer. 10M

OR

13. B). Compare IPv4 and IPv6 in at least four aspects. Draw both IPv4 and IPv6 headers with necessary labelling. 10M

(P.T.O..)

14. A). Draw the header format of TCP protocol and explain the fields present in the header. 10M

OR

14. B). Analyse the function of TCP sliding window and its role played in handling flow control at transport layer. 10M

15. A). Summarize the role played by HTTP protocol in the application layer. 10M

OR

15. B). Illustrate the functioning of DNS with your own example. 10M

*****

H.T No: | | | | | | | | | | | R18 | Course Code: A31201

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: AUTOMATA & COMPILER DESIGN

(Common for IT & CSC)

Date: 07.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Define NFA with example. 2 M
2. Considering the following grammar, remove left recursion and left factor to prove the grammar is LL (1) 2 M
   $L \rightarrow L ; S \mid S$
   $S \rightarrow id = E \mid id (E)$
   $E \rightarrow id \mid num$
3. Explain briefly about YACC parser. 2 M
4. Construct syntax tree for the expression (a+(b*c)^d-e/(f+g). 2 M
5. Differentiate between type conversion and type checking. 2 M
6. Model Chomsky hierarchy of grammars as diagram. 2 M
7. Explain the 3 areas of code optimization. 2 M
8. Define dynamic storage allocation. 2 M
9. Propose the issues in the design of a code generation. 2 M
10. Construct a DAG for the expression a=b*-c + b*-c. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). i) Compare and contrast between DFA and NFA. 4M
ii) Construct a NFA with ϵ equivalent to the regular expression: 10 + (0 + 11)0*1 6M

OR

11. B). Consider the grammar- 10M
$S \rightarrow bB / aA$
$A \rightarrow b / bS / aAA$
$B \rightarrow a / aS / bBB$
Construct Leftmost derivation, Rightmost derivation and Parse Tree for the string w = bbaababa.

12. A). Construct a LALR Parser for the Grammar: 10M
$S \rightarrow CC,$
$C \rightarrow cC,$
$C \rightarrow c/d$

OR

12. B). Write the syntax directed definitions for an expression and draw the Annotated parse tree '95*4 +5'. 10M

(P.T.O.)

13. A). i) Identify some solutions to resolve an overloaded symbol. 5M
ii) Distinguish static and dynamic Type checking. 5M

OR

13. B). Explain about the equivalence of type expressions in detail. 10M

14. A). Explain about the principles sources of optimization. 10M

OR

14. B). i) Differentiate between Static and Dynamic Storage allocation Strategies. 5M
ii) Explain in brief about Heap Storage allocation strategy. 5M

15. A). i) Discuss the code generation process involving the environment of the code generator. 5M
ii) Model the steps in code generation of the expression (A + B) / C + D. Assuming two machine registers are available. 5M

OR

15. B). Analyze legal evolution orders and names for the values at the nodes for the DAG for following? 10M

d := b + c
e := a + b
b := b * c
a := e - d.

*****

H.T No: | | | | | | | | | | | **R18** **Course Code: A30527**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech V Semester Regular/Supplementary Examinations December-2022
Course Name: INFORMATION SECURITY
(Common for CSE & IT)

Date: 09.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1.	Which cipher block modes of operations doesn't require decryption module?	2 M
2.	List out different security services.	2 M
3.	Differentiate MAC and Hash code.	2 M
4.	What are the applications of Elliptical curve cryptography?	2 M
5.	What is a public-key certificate?	2 M
6.	Why is R64 conversion useful for an e-mail application?	2 M
7.	What is the difference between SSL Connection and SSL State?	2 M
8.	What services are provided by IPsec?	2 M
9.	What is the role of compression in the operation of virus?	2 M
10.	What are the two common techniques used to protect a password file?	2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	i) Categorize security Mechnaisms and explain them in detail.	6M
	ii) Why Decryption module is not required in all cipher block modes of operation?	4M
	OR	
11. B).	i) How play-pair cipher technique is secure in message? Explain with an example.	5M
	ii) Illustrate where encrypted devices can be placed? and why?	5M
12. A).	State the value of the length field in SHA-512 if the length of the message is i) 1919 bits ii) 1920 bits iii) 1921 bits iv) 1922 bits and v) 1923 bits.	10M
	OR	
12. B).	i) The Elliptical cryptosystem parameters are E_{11} (1,6) and G = (2,7). B's secret key is n_B = 7. Find B's Public Key P_B.	5M
	ii) Explain RSA Algorithm in detail.	5M
13. A).	Explain how authentication can be implemented in Kerberos version 4 with a detailed authentication dialogue.	10M
	OR	
13. B).	Draw a neat sketch of X.509 Certificate format and X.509 CRL format and explain in detail.	10M

(P.T.O..)

14. A). Explain the ESP header format and discuss the scope of ESP Encryption and Authentication. 10M

OR

14. B). Illustrate step-by-step procedure of SET in detail with an example. 10M

15. A). i) What are the typical phases of operation of a virus or worm? 5M

ii) What is the difference between a packet filtering firewall and a stateful inspection firewall? 5M

OR

15. B). What is Intruder? Explain Intrusion Detection system with example. 10M

*****

H.T No: | | | | | | | | | | | **R18** **Course Code: A30516**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: OPERATING SYSTEMS

(Common for CSE & IT)

Date: 12.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)
Each question carries TWO marks. **10x2=20M**

1. State the two modes of operation and the bit used to identify them. 2 M
2. List any four services provided by the Operating Systems. 2 M
3. List any two advantages of cooperating processes. 2 M
4. State the criteria on which scheduling algorithms are evaluated. 2 M
5. State the critical section problem. 2 M
6. Compare the two types of Semaphores used for synchronization. 2 M
7. Explain the fragmentation problem in memory allocation. 2 M
8. Write short notes on Segmentation. 2 M
9. List the two types of file access methods used. 2 M
10. Why protection is important in operating systems? 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Enumerate the role played by system calls in Operating Systems. List and explain the different categories of system calls with examples. 10M

OR

11. B). i) Explain briefly about Real Time Systems. State the essential properties of Time sharing and distributed operating systems. 5M

ii) Explain any two operating system structures in detail. 5M

12. A). Consider the following snapshot of a system with seven processes, arrival times and burst times given. 10M

Pnumber	AT	BT
P1	0	8
P2	1	6
P3	2	5
P4	3	3
P5	3	4
P6	4	1
P7	5	2

Draw the Gantt Chart representations for Non-preemptive SJF and Preemptive SJF algorithms. Calculate the average Turn Around Time for both the algorithms. Compare Average Waiting time of Preemptive SJF with that of FCFS Scheduling algorithm.

(P.T.O..)

OR

12. B). Interpret why IPC is important and how is it implemented in Operating Systems. Explain Shared memory model for IPC in detail. 10M

13. A). Explain Deadlock Avoidance using Banker's algorithm with the following 10M

i) Data Structures
ii) Safety Algorithm
iii) Resource Request Algorithm
iv) Find the needed resources for every process?
v) Is the system being safe or not?

	Allocation				Max				Available			
	A	B	C	D	A	B	C	D	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	5	2	0
P1	1	0	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	0	0	1	4	0	6	5	6				

13. B). Explain how Semaphores could be used to solve the Bounded Buffer problem and Dining Philosophers problem. 10M

14. A). Discuss the performance of Demand Paging. Illustrate the steps involved in handling a Page Fault. 10M

OR

14. B). Consider the following page-reference string: 10M

0 1 3 6 2 4 5 2 5 0 3 1 2 5 4 1 0

How many page faults would occur for the LRU and optimal replacement algorithms, assuming 4 frames? Remember that all frames are initially empty, so your first unique pages will all cost one fault for each. Also, compute Hit ratio of each algorithm.

15. A). Explain various disk free space management methods with examples. 10M

OR

15. B). Describe briefly about the three file allocation methods highlighting the advantages and limitations of each method. 10M

*****

H.T No: | | | | | | | | | | | **R18** **Course Code: A30530**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: ARTIFICIAL INTELLIGENCE

(Common for CSE & IT)

Date: 14.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Give one definition of AI. 2 M
2. Define intelligent agent. 2 M
3. What is CSP? 2 M
4. What is binary constraint? 2 M
5. Define universal quantifiers. 2 M
6. Define semantic networks. 2 M
7. What is blocks world problem? 2 M
8. Define critical path in job scheduling problems. 2 M
9. What is unsupervised learning method? 2 M
10. What is a monte carlo algorithm? 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Give four definitions of Artificial intelligence system and justify the statement Agent=Architecture + Program. 10M

OR

11. B). Explain depth limited search with time and space complexity and how heuristic functions are useful to solve 8 Puzzle problem. 10M

12. A). Solve the constraint satisfaction problem. 10M

```
  T  W  O
  T  W  O
(+)
-----------
F  O  U  R
-----------
```

OR

12. B). Solve the Wumpus world problem with neat diagrams using Logic programming (prepositional logic or predicate logic). 10M

(P.T.O..)

13. A). Represent the following statements and solve the problem using resolution proof. 10M

S1: Everyone who loves all animals is loved by someone.

S2: Anyone who kills an animal is loved by no one.

S3: Jack loves all animals.

S4: Either Jack or Curiosity killed the cat, who is named Tuna.

S5: Did Curiosity kill the cat?

OR

13. B). Explain Semantics of Bayesian networks with example. 10M

14. A). Discuss How to solve the planning problems with state space search. 10M

OR

14. B). Discuss hierarchical planning approach with an example. 10M

15. A). How to represent conditional distributions efficiently with example. 10M

OR

15. B). Apply Inference using full joint distribution for the Figure 13.3 and find 10M

(i) P(cavity or toothache)

(ii) Marginal probability of Cavity

(iii) P(cavity|toothache)

(iv) P(no cavity|toothache)

	toothache		*¬toothache*	
	catch	*¬catch*	*catch*	*¬catch*
cavity	0.108	0.012	0.072	0.008
¬cavity	0.016	0.064	0.144	0.576

Figure 13.3 A full joint distribution for the *Toothache*, *Cavity*, *Catch* world.

*****

H.T No: | | | | | | | | | | | **R18** | **Course Code: C30162**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: KNOWLEDGE MANAGEMENT

(Common for ECE, CSE, IT & CSC)

Date: 19.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Define Knowledge Leverage. 2 M
2. What is Data Information? 2 M
3. What do you mean by Knowledge Management System? 2 M
4. What is Data Warehousing? 2 M
5. Write a short note on relationship with Knowledge Management to Service sector. 2 M
6. List out the challenges faced by service sector industry. 2 M
7. What is Knowledge Capital? 2 M
8. What is Physical Capital? 2 M
9. What is Business Intelligence? 2 M
10. Define Information Architecture. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). "Technological advances have greatly helped the growth of Knowledge Management, although the field has not yet reached full maturity". Elucidate the statement. 10M

OR

11. B). What is Knowledge Leveraging? Explain its key elements in detail. 10M

12. A). Explain the role of Information Technology in Knowledge Management Systems. 10M

OR

12. B). Explain the stages involved in developing Knowledge Management Systems. 10M

13. A). Explain the role of Knowledge Management in Service industry. 10M

OR

13. B). Explain the role of Knowledge Management in Manufacturing Industry. 10M

14. A). What is KM Process? Explain the steps involved in KM Process. 10M

OR

14. B). Explain any five points of difference between Knowledge Capital and Physical Capital. 10M

15. A). Discuss Roadblocks to success in relation to Knowledge Management. 10M

OR

15. B). Explain the 10-step process involved in KM Road Map to Amrittiwana. 10M

*****

H.T No: | | | | | | | | | | | **R18** **Course Code: C30165**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech V Semester Regular/Supplementary Examinations December-2022

Course Name: BASICS OF INSURANCE & TAXATION

(Common for EEE, ECE, CSE, IT & CSM)

Date: 19.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. What are different personal general insurance products? 2 M
2. Discuss pensions and annuities. 2 M
3. Examine claim management. 2 M
4. What is third party administration? 2 M
5. Outline direct and indirect taxes. 2 M
6. Distinguish between tax planning and tax evasion. 2 M
7. What is income exempt u/s 10 of the I.T. Act? 2 M
8. What are permissible deductions under chapter VI of I.T ? 2 M
9. Define advance payment of tax. 2 M
10. What is tax collection at source? 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Explain the principles of life insurance. 10M

OR

11. B). Interpret clauses and covers of different personal general insurance products. 10M

12. A). Examine legal framework of claim management as well claim settlement. 10M

OR

12. B). Summarize re-insurance in life insurance, retention limits and methods of re-insurance. 10M

13. A). Discuss tax structure and its role in Indian economy. 10M

OR

13. B). Appraise fundamental principles of income tax and concepts. 10M

14. A). Examine income from business, income from house property and income from other sources. 10M

OR

14. B). What is income act? Explain exemptions and deductions under the income tax act. 10M

15. A). Interpret computation of income in individuals with types of assessment. 10M

OR

15. B). Examine filing of return, e-filling and advance payment of tax. 10M

*****

H.T No: | | | | | | | | | | | **R18** | **Course Code: A36635**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

B.Tech (Minors in AI&ML) V Semester Regular Examinations December-2022

Course Name: FOUNDATIONS OF ARTIFICIAL INTELLIGENCE

(Common for CIVIL, EEE, MECH, ECE, IT & CSC)

Date: 19.12.2022 AN **Time: 3 hours** **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks. **10x2=20M**

1. Define Artificial Intelligence. 2 M
2. Label the syntax for predicate logic. 2 M
3. Name the three types of classification problems in machine learning. 2 M
4. Compare supervised learning and unsupervised learning. 2 M
5. How to choose step size adaptively in Gradient descent method? 2 M
6. Suggest a real time example for linear regression. 2 M
7. Show the cost function for logistic regression. 2 M
8. Can we use logistic regression for multiple classes? How? 2 M
9. List out the applications of cluster analysis. 2 M
10. Mention the task of clustering. 2 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Compare the procedural knowledge with declarative knowledge. 10M

OR

11. B). List out and explain any five mostly used artificial intelligence techniques. 10M

12. A). Analyze the role of matrix theory and statistics for machine learning. 10M

OR

12. B). Interpret the idea of machines learning from data with examples. 10M

13. A). Find the linear regression equation for the following set of data 10M

X	2	4	6	8
Y	3	7	5	10

OR

13. B). Demonstrate the functionality of Gradient descent method for linear regression. 10M

14. A). Examine the problem of overfitting with a suitable example. 10M

OR

14. B). Define classification. Illustrate the usage of logistic regression for performing classification. 10M

15. A). Show and interpret the how can we classify the Clustering algorithm. 10M

OR

15. B). Inspect the implementation of agglomerative hierarchical clustering. 10M

*****