

(3 hours)

[Total Marks : 80

N.B. (1) Question no. 1 is **compulsory**.(2) Attempt any **three** questions from the remaining **five** questions.(3) **All** questions carry **equal** marks.(4) **Figures** to the **right** indicate **full** marks.(5) Make **suitable** assumptions wherever **necessary** and **justify** them.

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|----|---|----|
| 1. | (a) Write in detail notes on octree and binary space partitioning trees. | 10 |
| | (b) Explain in detail the logical classification of input devices. | 10 |
| 2. | (a) Explain in detail the Back face culling method. | 10 |
| | (b) Specify the different steps involved in design of Animation sequence. | 10 |
| 3. | (a) What are the different 3D representation techniques used for solid modeling. | 10 |
| | (b) Prove that the multiplication of transformation matrices for each of the following sequence of operations is commutative. | 10 |
| | (i) Two successive rotations | |
| | (ii) Two successive scalings. | |
| 4. | (a) What is the CIE chromaticity diagram explain ? | 10 |
| | (b) What is the difference between parallel and perspective projection in detail ? | 10 |
| 5. | (a) Clip the line AB against the window PQRS using cohen sutherland line clipping algorithm :-
A (10, 100), B (100, 10) and P (20, 80)
Q (20, 20), R (80, 20) and S (80, 80). | 10 |
| | (b) Explain z-buffer algorithm and depth sort algorithm. | 10 |
| 6. | Write a note on :- | 20 |
| | (a) Hermite curves | |
| | (b) Bezier and B spline curves. | |

- N.B.: (1) Question No. 1 is compulsory
(2) Attempt any three questions from remaining five questions
(3) Assume suitable data if required

1. (a) Explain the classifications of cybercrime. 10
(b) Explain how criminals plan the attacks with relevant examples. 10
2. (a) Explain various security challenges posed by mobile devices and their counter measures. 10
(b) Explain in details SQL injection attack and its prevention. 10
3. (a) Discuss in details mitigation techniques for DOS and DDOS attacks. 10
(b) Explain social engineering and its classification. 10
4. (a) Explain computer forensics and digital forensics lifecycle. 10
(b) Explain various key challenges to organizations w.r.t Cyber security. 10
5. Write notes on : 20
 - a. Amendments to Indian IT Act
 - b. Relevance of OSI layers to computer forensics
 - c. Importance of End point security in organizations
 - d. Keylogger
6. (a) Discuss various attacks possible on wireless networks. Explain securing the wireless networks. 10
(b) Explain various types of phishing attacks and its countermeasures. 10

Hours =3

NB: Attempt any four questions.

Marks 80

- Q1 a) Explain the Suzuki Kasami algorithm with example. Analyze the best and worst case scenarios. 10
- b) Discuss mechanisms for building a distributed file system 10
- Q2 a) Discuss the advantages of DSM .Explain Migration Algorithm for implementing DSM. 10
- b) Explain any two Distributed Deadlock Detection Algorithms 10
- Q3 a) Discuss Multiprocessor Operating systems design issues . 10
- b) Explain the Distributed Database System.What is the serializability condition in DDBS. 10
- Q4 a) What are the characteristics of RTOS.Explain the microkernel and monolithic kernels. 10
- b) What are the components of Load distributing algorithms 10
- Q5 a) Explain user level and kernel level threads. 10
- b) Determine whether the following set of periodic real time tasks is schedulable under RMS for a uniprocessor system
T1=(e1=20,p1=100), T2: (e2=30,p2=150)
T3:(e3=60,p3=200) 10
- Q6 Write short notes on (any four). 20
- a) Test and Set instruction
- b) Fully replicated database systems.
- c) Kernel design of Symbian OS.
- d) Cloud OS.
- e) Affinity based scheduling
- f) Lamports logical clocks.

Note:

- 1) Q:1 is compulsory.
- 2) Attempt any three questions from remaining five questions.
- 3) Figures on the right, indicate full marks.
- 4) Assume suitable data whenever required.

Q:1

- a) Explain how an Adaptive Business Intelligence system achieves adaptability. [05]
- b) Explain stochastic hill climbing algorithm and its flow chart. [05]
- c) Explain the importance of Neural Network in design of a typical expert system [05]
- d) Explain the steps of SAW method with suitable example. [05]

Q:2

- a) Explain the roles of different components of a typical ABI system. [10]
- b) What is multiple regression? Consider the following data set.

Car ID	age (in years)	miles (in thousands)	resale price (in lakhs)
1	5	57	8.5
2	4	40	10.3
3	6	77	7
4	5	60	8.2
5	5	49	8.9
6	5	47	9.8
7	6	57	6.6
8	6	39	9.5
9	2	8	16.9
10	7	69	7
11	7	89	4.8

Estimate the resale price of a car with (age=3 & miles=30) [10]

Q:3

- a) Explain PSO algorithm and its flow chart with suitable example. [10]
- b) "The decision making becomes difficult for a complex business problem when number of possible solutions is very large". Justify this statement with suitable example. [10]

Q:4

- a) Consider smart phone selection problem. The criteria to be considered are cost, camera, internal memory, battery life and style. The following table gives measurements of above mentioned criteria for 4 smart phones. Generate the ranking of the alternatives using AHP method. [15]

phone	camera (mega pixels)	internal memory (GB)	battery life (hours)	style	cost (in thousand Rs)
ph1	8	4	8	good	17.8
ph2	12	8	8.5	very good	35.5
ph3	4	4	9	average	12
ph4	40	16	7.5	best	45.4

- b) Explain difficulties in integrating multiple business intelligence systems. [05]

Q:5

a) What is Bayes model? Consider the following dataset.

Car ID	make	miles	color	damage	resale price
1	ford	low	silver	yes	low
2	ford	high	red	no	low
3	Nissan	high	gray	yes	average
4	ford	average	gray	yes	average
5	Suzuki	low	white	no	low
6	BMW	high	black	no	high
7	ford	average	white	yes	average
8	Nissan	average	black	yes	high
9	BMW	average	red	no	high
10	Suzuki	low	silver	yes	average

Estimate the resale price of a car with (make="Nissan", miles="low", color="black", damage="yes") using Bayes model. [10]

b) Explain in detail about evolutionary algorithms for optimization. [10]

Q:6 Attempt any two [20]

a) Adaptive business intelligence system for investment strategy.

b) Explain any one distance based method for prediction.

c) Write a detailed note on genetic algorithm.

- N. B. :** (1) Attempt any **four** questions.
(2) Assume suitable data if necessary.

1. (a) Design and explain any one wireless network scenario with the help of diagram and represent various wireless devices used in the design. 10
(b) What do you mean by hybrid routing protocol ? Explain ZRP protocol in detail. 10
2. (a) Draw the architecture of 3GPP EPS. Explain different blocks in details. 10
(b) Explain DSR routing protocol in detail. 10
3. (a) Explain SDR architecture and discuss how to overcome its limitations. 10
(b) Explain the design of cognitive radio architecture for MAC layer switching. 10
4. (a) List and explain characteristics for design of a new architecture for opportunistic communication and delay tolerant networking. 10
(b) Explain the protocol architecture of KioskNet with respect to the following layer :- 10
 - (i) Virtual Link Layer
 - (ii) Virtual Network Layer
5. (a) With the help of diagram explain the frame structure of LTE. 10
(b) Explain the responsibilities of UMB PHY layer and MAC layer. 10
6. Write short notes on:- 20
 - (a) Location based security services
 - (b) Differentiate between VANET and MANET
 - (c) Role of eNB's in E-UTRAN
 - (d) Power saving option in UMB.