Final Syllabus

Exam time- 6 hours (10AM-4PM)

Total- 4 set questions (8 questions)

Time- 30 minutes per questions (4 hours)

(20 minutes- organize/search, 10minutes- write answer)

Complete exam→ 10AM-2PM

Scan, revise→ 2- 2:44PM

Submit by 2:45 PM

Computer Networks

Date: 02/08/2021

Almost 2 set question from subnetting

Logical things more than theory

Lec-1 (done)

→ **Network Security and Cryptography**

1. Public Key Encryption
2. **RSA Algorithm**

Lec-2(done)

→ **Routing Protocols**

1. About RP
2. Broadcast and Multicast Routing
3. Broadcast routing algorithms (source duplication vs in-network duplication)
4. **Flooding (Uncontrolled and controlled flooding)**
   Broadcast storm

Lec-3

→ **Routing Protocols**

1. **The Distance-Vector (DV) Routing Algorithm**

2. Subnetting

Lec-4

→ Subnetting

1. Subnetting Math
2. CIDR
3. VLSM math

Lec-5(done)

→ Wireless and Mobile Networks

1. **Wireless Network**
2. Elements of a wireless network
3. The IEEE 802.11 wireless LAN
4. The 802.11 Architecture
5. Channels and Association

Lec-6

→ Wireless and Mobile Networks

1. **Hidden terminal problem**
2. RTS and CTS (to solve hidden terminal problem)
3. **Collation avoidance using RTS and CTS frames**
4. The IEEE 802.11 frame

Lec-7

→ Computer network a top down approach

1. Network address translation (NAT)
2. Address translation protocol

AI and Expert Systems

Lec-1 (done)

Most of the question will come from predicate logic.

Definition of modus ponens and find a conclusion from a symbolic expression.

→ Foundation of logic

1. What is logic?
2. Why is logic important?
3. What is argument?
4. Deduction and Interference. (examples)
5. Two logical systems:
    i. Propositional logic
    ii. Predicate logic
    Propositions in propositional logic
6. Some popular Boolean operators
7. Different types of operator:
    i. The Negation Operator
    ii. The Conjunction Operator
    iii. The Exclusive or Operator
    iv. The Implication Operator
8. Implications between real sentences.
9. Biconditional Truth Table
10. Converse/Contrapositive
11. Logical Equivalence
12. Predicate logic
    i. For all
    ii. For some
13. **Application of predicate logic (very important) ***
14. Modus Ponens and Modus Toluene *

Lec-2 **(done)**

Must 1 question in exam.

→ First-order logic

1. Pros of First-Order Logic.
2. Logics in General.
3. Syntax of First-Order Logic.
4. Components of First-Order Logic.
5. Examples.
6. Properties of Quantifiers.
7. **Nesting Quantifiers. (examples)***
8. Fun with sentences
9. Other comments about quantification.

Lec-3

Must 1 question in exam.

→ Genetic Algorithm

1. Introduction to GA
2. Main steps of GA
3. Genetic Operator: Cross-over
4. Genetic Operator: Mutation
5. **GA Examples***

Lec-4

Must 1 question in exam.

→ Evolutionary Computation (GA Calculation)

1. Can evolution be intelligent?
2. Simulation of natural evaluation.
3. How is a population with increasing fitness generated?
4. Basic genetic algorithms.
5. **Genetic algorithms: case study. ***

Lec-5

*Must 1 question in exam. ***

See the text book.

Parallel example will come (as like slide example).

→) Bayes rule (done)

1. Terminology/Notation Primer.
2. Predicted Probability example.
3. **Apply Bayes' rule. ***
4. How to apply Bayes' theorem to data mining and datasets?
5. Naïve Bayes Classifier.
6. Conditional Independence formula.

Lec-6 (done)

See the text book.

→) Artificial Neural Network.

1. Artificial Neuron and Rosenblatt's Single Layer Perception.
2. Perceptron's Learning Algorithm.
3. Activation Function. (Result depend on this).
4. **Learning. ***
   Types of learning:
   i. The supervised learning.
   ii. The unsupervised learning.

Lec-7 (done)

See the text book.

At least 10 marks question will come from this lecture.

→) Artificial Neural Network.

1. **Rosenblatt's Perceptron (details). ***
   i. Single layer perceptron.
   ii. Multilayer perceptron.
- Linearly separable classes and linearly non-separable classes.

Last Lecture

→) Introduction to Bayesian Networks

Computer Graphics

- 1 set question from lec- 1,2

Theoretical questions- 1 set

Mathematical questions- 3 set

Lec-1

→ Geometric 2D transformation

Book: Chapter-5

1. Basic Two-Dimensional Geometric Transformations
2. Geometric transformations details:
    i. 2D Translation
    ii. 2D Rotation
    iii. 2D Scaling

Lec-2

→ Geometric 2D transformation

Book: Chapter-5

1. Math solutions (4.5, 4.9, 4.10, 4.11)

Lec-3

→ Illumination II – Global Models

1. What transmission looks like.
2. Global Illumination.
3. Test Scene
   Locally illuminated test scene
   Solutions to Gouraud artefacts.
4. Use local illumination
5. Adaptive tree depth control
6. Global vs local illumination

Lec-4

At least 5 marks from this lecture.

Slide up to 28

→ **Illumination and Shading**

1. Discrete Illumination Models
2. Illumination Models
3. Elements of Lighting at a point
4. Reflection
   Specular reflection
5. The hall Illumination Model, Components of Hall model
6. Diffuse Reflection of Light Sources
7. Ambient light, Implementation
8. Diffuse Reflection of Light Sources
9. Doing this in code
10. Reflection Angles, Implementations
11. Spectacular Reflection from other surfaces.

Lec-5

1 question.

Slide up to 23

→ **Viewing and Projection**

1. Objectives
2. Classical viewing
3. Perspective vs Parallel
4. Advantages and disadvantages
5. Orthographic projection
6. Multiview Orthographic Projection
7. Axonometric Projections and types (dimeric, trimetric, Isometric), advantages and disadvantages.
8. Oblique Projection
9. Perspective Foreshortening
10. Vanishing points
11. Three-point perspective
12. Two-point perspective
13. Homogeneous coordinate representation, Homogeneous coordination form

→ Representing Curves and Surfaces

Slide page- 28,29,30

1. Find out M of H and G of H from Hermit Curves. (Prove).
2. Book page: 144, problem no- 7.1