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PRANVEER SINGH INSTITUTE OF TECHNOLOGY, KANPUR

Odd Semester Session 2023-24 Pre-University

B. Tech. VII Semester

Cryptography and Network Security (KCS 074)

CO Number	Course Outcome (Please include all COs of your Course here)
CO1	**Define [L1: Knowledge] various encryption & decryption algorithms, message authentication codes, digital signature and ability to relate [L1: Knowledge] modular arithmetic approaches and network security approaches with data security.**
CO2	**Explain [L2: Comprehension] Key management & Distribution technique, Electronic mail security and Discuss [L2: Comprehension] IP Security and System Security for keys used for encryption and decryption.**
CO3	**Solve [L3: Application] prime numbers, relative prime numbers and various modular arithmetic problems, discrete logarithmic problems and able to Apply [L3: Application] them in public key cryptosystem to compute [L3: Application] keys for encryption and decryption purpose.**
CO4	**Compare [L4: Analysis] Fermat's and Euler's Theorem, public and private cryptosystem and various other techniques of cryptography and network security.**

Time: 3.0 Hrs. M. M. 100

Section A

(2X10 = 20 Marks)

Q1. Attempt all questions:

a)	Define the Euler's Totient function with an example	CO 1
b)	Find the greatest common divisor of 2740 and 1760.	CO 1
c)	State the weak collision resistant in hash function.	CO 1
d)	Discuss Shannon's theory of confusion and diffusion.	CO 2
e)	Define the triple DES.	CO 1
f)	Summarize symmetric and asymmetric key cryptography.	CO 4
g)	Define how padding bits are appended in SHA-1.	CO 1
h)	Explain the Avalanche effect.	CO 2
i)	Differentiate between classical cryptography and modern cryptography.	CO 4
j)	Find the value of Ø (49).	CO 2

Section B

(10X3 = 30 Marks)

Q2. Attempt all questions:

a i)	Summarize Kerberos version 4 in detail and also examine how it is different from version 5.	CO 4
	Or	
ii)	Examine the man in middle attack over the Diffie-Hellman key exchange protocol with example.	CO 4
b i)	Explain any four modes of operation of a block cipher with a suitable diagram.	CO 3
	Or	

ii) Illustrate SSL in detail with their layers. Also differentiate from TLS. CO 3

c i) State the digital signature with a suitable diagram. Also illustrate ElGamal Digital Signature Techniques also discuss its correctness. CO 2

Or

ii) Define Hash Function. Discuss SHA-1 with all required steps, round function and block diagram. Also compare with MD5. CO 3

Section C

Q3. Attempt all questions: **(10X5 = 50 Marks)**

a) i) Discuss the e-mail security and also explain pretty good privacy in detail. CO 2

Or

ii) Explain the concept of security association (SA) in IPSec also define the use of ISAKMP protocol. CO 2

b) i) Explain Playfair cipher technique. Apply the Playfair cipher technique to encrypt the plain text message '**COMSEC means communications security**' with the help of key 'GALOIS' ('**X**' can be add in case of repetitive characters in plaintext message). CO 3

Or

ii) Decrypt the ciphertext **"FKMFIO"** , using Hill cipher for the given key = CO 3

$$\begin{bmatrix} 2 & 3 \\ 3 & 6 \end{bmatrix}$$

c) i) Illustrate the AES encryption/decryption architecture with a suitable diagram and also explain all the stages involved in the AES algorithm. CO 3

or

ii) Illustrate the Chinese Remainder Theorem. Use the CRT to solve an x such that CO 3

$$x \equiv 2 \pmod 5$$
$$x \equiv 3 \pmod 7$$
$$x \equiv 10 \pmod{11}$$

d) i) Discuss the definition and working process of firewall and it's types. CO 2

or

ii) Explain the definition, phases, and types of virus and structures of viruses. Also define intrusion detection system.

e) i) Demonstrate about the elliptic curve cryptography. Define its use in encryption and authentication. CO 2

Or

ii) Explain any five: CO 2

1. S/MIME
2. GF(p)
3. Steganography
4. Known cipher text attack & Known plaintext attack
5. Non-Repudiation
6. RSA Algorithm

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PRANVEER SINGH INSTITUTE OF TECHNOLOGY KANPUR

Odd Semester Session 2023-24 Pre-University

B. Tech. VIIth Semester

Mobile Computing (KCS-711)

CO Number	Course Outcome
CO1	Define **[L1: Knowledge]** the different issues in mobile computing and describe the overviews of wireless telephony and channel allocation in cellular systems.
CO2	Explain **[L2: Comprehension]** the concepts of Wireless Networking and Wireless LAN.
CO3	Apply **[L3: Application]** the mobile computing techniques for solving the Data management issues like data replication for mobile computers, adaptive clustering for mobile wireless networks and Disconnected operations.
CO4	Analyze **[L4: Analysis]** the Mobile computing Agent's issues pertaining to security and fault tolerance and various routing protocols using Adhoc networks.

Time: 3 Hrs. M. M. 100

Section A

Q1. Attempt all questions: **(2X10 =20 Marks)**

a) Define the term Mobile IP. CO1

b) Describe the concept of frequency reuse in cellular communication. CO2

c) Describe the handover/handoffs in cellular communications. CO2

d) Describe the use of Care-of-Address (CoA) in Mobile IP. CO2

e) Describe the fault tolerance for mobile agent computing. CO3

f) Explain the concept of disconnected operation with reference to file management in agent based computing. CO2

g) Examine the reasoning behind choosing hexagonal shape for cells in cellular systems. CO2

h) Differentiate between proactive and reactive types of Ad-hoc routing protocols. CO4

i) Explain hidden and exposed node problems in wireless LAN. CO2

j) List the four control packets used by TORA. CO1

Section B

Q2. Attempt all questions. **(10X3 = 30 Marks)**

a) Describe handoff/handover in 1G systems. CO2

b) Illustrate the near-far problem in CDMA systems. CO3

OR

c) Illustrate all the entities of a Mobile IP system. Explain the registration process of a home agent in a foreign network. CO3

d) Illustrate any two models proposed to improve the TCP's performance over wireless network. Also give its advantages and disadvantages. CO4

OR

e) Describe Fisheye State Routing (FSR). Investigate the methodology used by FSR to compensate for the imprecise knowledge of the path from source to destination. CO4

Section C

Q3. Attempt all questions: **(10X5 = 50 Marks)**

a i)	Explain Data Replication for a mobile computing system. Also, discuss different types of data replication strategies used in mobile computing	CO2
	OR	
ii)	Describe different applications of mobile computing. Give any suitable live example with merit of mobile computing.	CO2
b i)	Describe the different services offered by GSM. Explain its architecture in detail.	CO2
	OR	
ii)	Explain the fault tolerance in mobile computing environment in detail. Discuss its different monitoring process.	CO2
c i)	Explain different data management issues in mobile computing system. Describe the features of CODA file system.	CO2
	OR	
ii)	Explain the physical layer specification of Bluetooth. Describe *piconet* and *scatternet* formations in detail.	CO2
d i)	Illustrate the characteristics of MANET. Describe some real life scenarios where it can be used.	CO3
	OR	
ii)	Explain the *advantages* of agent base computing. Illustrate the characteristics of a *fault tolerant* mobile agent.	CO3
e i)	Analyze the impact of mobile computing on following aspects of data management. **a)** Data dissemination **b)** Query Processing	CO4
	OR	
ii)	Illustrate the DSDV routing with an example demonstrating the exchange of updated routing table by a node, in response to a topological modification.	CO4

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PRANVEER SINGH INSTITUTE OF TECHNOLOGY KANPUR

ODD Semester Session 2023-24 Pre-University

B. Tech. 7th Semester

Renewable Energy Resources (KOE-074)

CO Number	Course Outcome
CO1	**Define** Various Non-conventional and renewable Energy resources with their advantages and disadvantages.
CO2	**Describe** the challenges and problems associated with the use of various energy sources, including fossils fuels, with regards to future supply and the environment.
CO3	**Apply** the knowledge of Renewable energy resources so as to generate alternative energy resources other than the conventional energy resources.
CO4	**Calculate** parameters of various energy power plants.

Time: 3 Hrs. M. M. 100

Section A

Q1. Attempt all questions: **(2X10 =20 Marks)**

a)	What is an aerobic digestion?	CO2
b)	What is the maximum energy conversion efficiency of a wind turbine for a given swept area?	CO4
c)	Write the chemical reaction takes place in Alkaline Fuel Cell.	CO1
d)	Show the kelvin relationship for thermoelectric generator & thermionic converter.	CO4
e)	Calculate Hour angle at 1:30 PM solar time on 10 April, 2020.	CO4
f)	Define solar constant. What is its standard value?	CO4
g)	Sketch Moveable drum type Biogas power plant.	CO3
h)	On what factors does the collector efficiency of a solar flat plate collector depend?	CO2
i)	Calculate the overall efficiency of an OTEC plant if the temperature of warm water in the surface layer is 31°c & temperature of cold water in the depth of tropical ocean is 9°c.It can be assumed that the relative efficiency factor of the power plant is 0.4.	CO4
j)	Describe various Geothermal Energy Resources.	CO2

Section B

Q2. Attempt all questions: **(10X3 = 30 Marks)**

a)	Explain the essential features of a hydrogen-oxygen cell. Draw a suitable diagram of this cell and give the reactions took place at the electrodes.	CO3
b i)	Explain the 'Single Basin' and 'Two Basin' systems of tidal power harnessing. Discuss their advantages and limitations.	CO3
	OR	
ii)	Describe the basic principle of ocean thermal energy conversion (OTEC).What are the main types of OTEC power plant? Describe their working in brief.	CO3
c i)	How would you select suitable material for a fabrication of solar cell?	CO2
	OR	
ii)	What is the Biomass? How does biomass conversion take place? Describe the materials used for biogas generation and factors that are affect the size of biogas power plant.	CO2

Section C

Q3. Attempt all questions: **(10X5 = 50 Marks)**

a i) Classify different types of solar thermal collector and show the constructional details of a flat plate collector. What are its main advantages? CO4

OR

ii) Analyze the performance of solar cell and also show the relationship between Form factor, Voltage factor and Efficiency. CO4

b i) Define the following Energy Resources with examples- CO1

(i) Primary & Secondary Energy Resources
(ii) Commercial & Non-Commercial Energy Resources
(iii) Renewable & Non Renewable Energy Resources
(iv) Conventional & Non-Conventional Energy Resources.

OR

ii) List all the advantages and disadvantages of the following Energy Resources- CO1

(i) Chemical Energy
(ii) Wave Energy
(iii) Solar Energy
(iv) Wind Energy

c i) Interpret the following geothermal system with T-S diagram. CO3

(i) Binary cycle liquid dominated system
(ii) Hot dry rock system.

OR

ii) Interpret the working of solar pond with the help of diagram. CO3

d i) With the help of a schematic diagram, explain the operation of open cycle MHD generating system. CO3

OR

ii) Describe the principle of working and constructional details of basic thermionic generator and also analyse its performance. CO3

e i) Discuss the following solar power plant with the help of block diagram. CO3

(i) Autonomous solar power plant
(ii) Grid Connected solar power plant

OR

ii) Discuss the manufacturing of Ethanol and Methanol from biogas with the help of block diagram. CO3

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PRANVEER SINGH INSTITUTE OF TECHNOLOGY KANPUR

Odd Semester Session 2023-24 Pre-University

B.Tech. VII Semester

PROJECT MANAGEMENT & ENTREPRENEURSHIP (KHU-702)

CO Number	Course Outcome
CO1	Define [L1] the basic terms and performance indicators of Entrepreneurship, Project Management and finance Management
CO2	Describe [L2] the theories of Entrepreneurship, Project Management and finance Management.
CO3	Illustration[L3] of business models, Project Modals and financial sheets of various Enterprise.
CO4	Analyze[L4] all performance indicating parameters of the Project Managements & Finance.

Time:3Hrs. M.M.100

Section A

Q1. Attempt all questions: **(2X10 =20 Marks)**

a) Explain the difference between entrepreneur and intrapreneur. CO2
b) Explain about innovation. CO2
c) Describe business opportunities. CO2
d) Define value creation. CO1
e) Explain the importance of program management. CO2
f) List the roles of program manager in a project. CO1
g) Define project cost estimation. CO1
h) Explain briefly about capital budgeting. CO2
i) Describe the objectives of market management. CO2
j) Define marketing for social enterprise. CO1

Section B

Q2. Attempt all questions: **(10X3 = 30 Marks)**

a) Describe the traits found in successful entrepreneurs. CO2
b) Explain McClelland's achievement motivation theory in detail. CO2

OR

c) Describe the conceptual model of entrepreneurship. CO2
d) Illustrate different types of innovations on the basis of change in market and technology. CO3

OR

e) Illustrate in detail various stages of total life cycle of a project. CO3

Section C

Q3. Attempt all questions **(10X5 = 50 Marks)**

a) i) Explain the factors affecting entrepreneurial development in detail. CO2

OR

ii) Explain entrepreneurial development programs. Explain some EDPs in detail. CO2

b) i) Illustrate various types of tools for idea generation. Explain business opportunities in detail. CO3

OR

ii) Illustrate the steps to create enterprise model. Also give strategies to maintain organization effectiveness. CO3

c) i) Explain methods of demand forecasting in market appraisal. CO2

OR

ii) Explain project appraisal and technical appraisal in detail. CO2

d) i) Elaborate the various sources of funds. CO4

OR

ii) Elaborate capital budgeting and also explain the process of capital budgeting in detail. CO4

e) i) Explain Risk Management in Social Enterprises in detail. CO2

OR

ii) Explain about legal framework. Also explain legal structures used in social entrepreneurship sectors in detail. CO2