BHARTIYA SKILL DEVELOPMENT UNIVERSITY

Registration No.: .....

School of Computing Skills

Session: 2022 (Winter Semester)

B. Voc. Program, III Semester,

2nd In-Sem. Examination

Course Code: ITN1302 **Time: 1 Hour**

Course Name: Wireless Networks **Max. Marks: 20**

Section – A

05X01 = 05 Marks

Q1. Which of the following is the world's first cellular system to specify digital modulation and network level architecture?
a) GSM
b) AMPS
c) CDMA
d) IS-54

Q2. Which of the following memory device stores information such as subscriber's identification number in GSM?
a) Register
b) Flip flop
c) SIM
d) SMS

Q3. Which of the following does not come under subsystem of GSM architecture?
a) BSS
b) NSS
c) OSS
d) Channel

Q4. Which of the following subsystem provides radio transmission between mobile station and MSC?
a) BSS
b) NSS
c) OSS
d) BSC

Q5. SIM in the GSM network stands for _____.
a) Subscriber Identity Module
b) Subscriber Investigation Mobile
c) Subscriber Identification Mobile
d) Smart Identification Module

Section – B

03X02 = 06 Marks

Q1. Explain the functions of MSC in a GSM network?

Q2. What is Roaming in GSM?

Q3. What is BTS, BSC and MSC in GSM?

Section – C

03X03 = 09 Marks

Q1. What is SGSN and GGSN?

Q2. What is the difference between 2G and 2.5G systems?

Q3. How do we increase the capacity (when subscribers increase) in GSM networks?

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Answers

Q1. A ,Q2. C , Q3. D, Q4. A ,Q5. A

Section – B

03X02 = 06 Marks

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Section – B

Q1. The mobile switching centre (MSC) is the primary service delivery node for GSM/CDMA, responsible for routing voice calls and SMS as well as other services (such as conference calls, FAX, and circuit-switched data).

The MSC sets up and releases the end-to-end connection, handles mobility and hand-over requirements during the call and takes care of charging and real-time prepaid account monitoring.

Q2. Roaming enables a mobile subscriber to automatically make and receive voice calls, send and receive data, or access other services when travelling outside the geographical coverage area of their home network, by means of using a visited network.

Q3. Base trans receiver station, Base station controller and Mobile switching centre.

Section – C

Q1. GGSN (Gateway GPRS Support Node) and SGSN (Serving GPRS Support Node) are two core network nodes in 2G GSM and 3G UMTS networks that enable packet-switched mobile internet. GGSN and SGSN were added to GSM networks as part of the GPRS enhancement, and they are used by both GSM and 3G UMTS networks.

Q2. Cellular phone technologies are delineated by generations, with each generation having different technologies and different features. If the improvements are not really very significant, there are often characterized as half-steps. This is the case with 2G and 2.5G. The main difference between 2G and 2.5G is the implementation of packet switching, which is what is used in computer networks. The main focus of 2G is to provide voice services and utilize circuit switching mainly.

The advantages that 2.5G provides are a result of the previous difference. Mainly, the increased data speed ranging from 56kbps to 115kbps. Faster speeds are not really needed if you just use your cell phone for voice calling or text messaging. But the increased speeds also opened up a new set of services to the consumers.

Q3. By adding more number of cells by reducing the size of existing cells.

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Registration No.: .....

Name - .....

School of Computing Skills

B.Voc Program, III Semester (2022)

2 In-Sem. Examination

Course Code : ITN1303

Course Name : Basic of Network Security

Time: 1 hour

Instruction: Explain in detail for long answer

Max. Marks : 20

Section-A

1X5 = 5 Marks

Q.1 A computer _____ is a malicious code which self-replicates by copying itself to other programs.

a) program
b) virus
c) application
d) worm

Q.2 Which of them is not an ideal way of spreading the virus?
a) Infected website
b) Emails
c) Official Antivirus CDs
d) USBs

Q.3 What is the software called which when get downloaded on computer scans your hard drive for personal information and your internet browsing habits?

a) Backdoors
b) Key-logger
c) Malware
d) Antiware
e) Spyware

Q.4 _____ is the part of malware such as worms or viruses which performs the malicious action; deleting data, sending spam or encrypting data.

a) Denial of service
b) Exploits
c) Scams
d) Payload
e) Spamming

Q.5 Which one is not a computer virus .....

a) Avast
b) Trojan horse
c) Logic bomb
d) Spyware

Section B

03X02= 06 Marks

Q.1 Explain cryptography ?

Q.2 What is Steganography ?

Q.3. Difference between symmetric and asymmetric key encryption ?

Section C

03X03=09 Marks

Q.1 Explain RSA algorithm with 6 steps ?

Q.2 Explain digital signature with diagram ?

Q.3 Calculate the encryption and decryption of a person name as Daya with key 7 ?

Encryption : Plain text = DAYA key = 2 cipher text = _____?

Decryption : cipher text = _____? key = 2 plain text = DAYA

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School of Computing Skills

B. Voc. Program, 1st Semester (2022)

2nd In-Sem. Examination

Course Code: ITN1303 **Time: 1 Hour**

Course Name: Basics of Network security **Max. Marks: 20**

Instruction: Attempt all questions

Solution Answer sheet

Section A

Answer 1: worm

Answer 2 : Official antivirus cd

Answer 3 : Spyware

Answer 4: Payload

Answer 5 : Avast

Section B

Answer 1 : Cryptography is **the study of secure communications techniques that allow only the sender and intended recipient of a message to view its contents**. The term is derived from the Greek word kryptos, which means hidden

Answer 2 : Steganography is the practice of concealing a message within another message or a physical object. In computing/electronic contexts, a computer file, message, image, or video is concealed within another file, message, image, or video.

Answer 3 :

On the basis of	Symmetric Encryption	Asymmetric Encryption
Keys used	It uses a single shared key (secret key) to encrypt and decrypt the message.	It uses two different keys for encryption and decryption.
Size	The size of ciphertext in symmetric encryption could be	The size of ciphertext in asymmetric encryption could be the same or larger than

	the same or smaller than the plain text.	the plain text.
Efficiency	It is efficient as this technique is recommended for large amounts of text.	It is inefficient as this technique is used only for short messages.
Speed	The encryption process of symmetric encryption is faster as it uses a single key for encryption and decryption.	The encryption process in asymmetric encryption is slower as it uses two different keys; both keys are related to each other through the complicated mathematical process.
Purpose	Symmetric encryption is mainly used to transmit bulk data.	It is mainly used in smaller transactions. It is used for establishing a secure connection channel before transferring the actual data.
Security	It is less secured as there is a use of a single key for encryption.	It is safer as there are two keys used for encryption and decryption.
Algorithms	The algorithms used in symmetric encryption are 3DES, AES, DES, and RC4.	RSA, DSA, Diffie-Hellman, ECC, Gamal, and EI.
Existence	It is an old technique.	It is a new technique.

Section C :

Answer 1 : RSA encryption algorithm is a type of public-key encryption algorithm. To better understand RSA, lets first understand what is public-key encryption algorithm.

- Select two large prime numbers, p and **q**.
- Multiply these numbers to find **n = p x q,** where **n** is called the modulus for encryption and decryption.
- Choose a number **e** less than **n**, such that n is relatively prime to **(p - 1) x (q -1).** It means that **e** and **(p - 1) x (q - 1)** have no common factor except 1. Choose "e" such that $1<e<\varphi(n)$, e is prime to $\varphi(n)$,
  gcd (e,d(n)) =1
- If **n = p x q,** then the public key is <e, n>. A plaintext message **m** is encrypted using public key <e, n>. To find ciphertext from the plain text following formula is used to get ciphertext C.
  $C = m^e \bmod n$
  Here, **m** must be less than **n**. A larger message (>n) is treated as a concatenation of messages, each of which is encrypted separately.
- To determine the private key, we use the following formula to calculate the d such that:
  $D_e \bmod \{(p - 1) \times (q - 1)\} = 1$
  Or
  $D_e \bmod \varphi(n) = 1$
- The private key is <d, n>. A ciphertext message **c** is decrypted using private key <d, n>. To calculate plain text **m** from the ciphertext c following formula is used to get

plain text m.
$\mathbf{m = c^d \bmod n}$

Answer 2 : A digital signature is exactly what it sounds like a modern alternative to signing documents with paper and pen.

It uses an advanced mathematical technique to check the authenticity and integrity of digital messages and documents. It guarantees that the contents of a message are not altered in transit and helps us overcome the problem of impersonation and tampering in digital communications.

Digital signatures also provide additional information such as the origin of the message, status, and consent by the signer.

Using a mathematical algorithm, digital signing solution providers such as Zoho Sign will generate two keys: a public key and a private key. When a signer digitally signs a document, a cryptographic hash is generated for the document.

That cryptographic hash is then encrypted using the sender's private key, which is stored in a secure HSM box. It is then appended to the document and sent to the recipients along with the sender's public key.

The recipient can decrypt the encrypted hash with the sender's public key certificate. A cryptographic hash is again generated on the recipient's end.

Both cryptographic hashes are compared to check its authenticity. If they match, the document hasn't been tampered with and is considered valid.

Answer 3

Plain text : Daya

Key 7

Cipher text : KHFH

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School of Computing Skills
Session: 2022 (Winter Semester)
B. Voc. Program, III Semester
2nd In-Sem. Examination

Course Code: ITN1305 **Time: 1 Hour**
Course Name: Optical fiber communication **Max. Marks: 20**
Instruction: Answer All Questions

Section – A **05X01 = 05 Marks**

1. OTDR stands for _____.

A) Optical time domain reflectometer
B) Optical transfer data rate
C) Optical time data registers
D) None of the mentioned

2. Which one of the following is NOT a connector termination tool?

A. Shear
B. Cleaver
C. SC
D. Stripper

3. Plastics optical cables can be used for _____.

A. Short Range
B. Medium range of distance
A. C. Long range of distance
D) Very high range of distance

4. A single mode optical fiber has a core diameter of _____ nm.

A. 0.1
B. 0.01
C. 0.2
D. 0.05

5. Cladding in glass fibre have high refractive index than the core.

A. True
B. False

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Section -B 03X02 = 06 Marks

Q1. What is the difference between single fiber connector and multiple fiber connector?

Q2. Which device we can use to cleave the fiber?

Q3. What is the connector in Fibre optic?

Section – C 03X03 = 09 Marks

Q1. What is difference between SC and LC?

Q2. Explain media converter.

Q3. What is Principle of Optical Fiber Communication?

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School of Computing Skills
Session: 2022 (Winter Semester)
B. Voc. Program, III Semester
2nd In-Sem. Examination

Course Code: ITN1305 **Time: 1 Hour**
Course Name: Optical fiber communication **Max. Marks: 20**
Instruction: Answer All Questions

Section – A **05X01 = 05 Marks**

1. OTDR stands for _____.

A) Optical time domain reflectometer
B) Optical transfer data rate
C) Optical time data registers
D) None of the mentioned

Answer: A) Optical time domain reflectometer

2. Which one of the following is NOT a connector termination tool?

A. Shear
B. Cleaver
C. SC
D. Stripper

Answer: C) SC

3. Plastics optical cables can be used for _____.

A. Short Range
B. Medium range of distance
A. C. Long range of distance
D) Very high range of distance

Answer: A) Short Range

4. A single mode optical fiber has a core diameter of _____ nm.

A. 0.1
B. 0.01
C. 0.2
D. 0.05

Answer: B) 0.01

5. **Cladding in glass fibre have high refractive index than the core.**

A. True
B. False

Answer: B) False

Section -B 03X02 = 06 Marks

Q1. What is the difference between single fiber connector and multiple fiber connector?

Single mode fiber: a fiber featuring a small light-carrying core of about 9 micrometres (μm) in diameter. For reference, a human hair is closer to 100 μm. The core is surrounded by a cladding that brings the overall diameter of the optical fiber to 125 μm.
Multimode fiber: a fiber with a core of 50 μm or above. A larger core means multiple modes (or rays of light) can travel down the core simultaneously. Just like single mode, the core is surrounded by a cladding that brings the overall diameter of the optical fiber to 125 μm.

Q2. Which device we can use to cleave the fiber?

In simple terms, a cleaver is used to cut your fiber so you have two ends that will line up and can be welded together using a fusion splicer or they can be brought together in a mechanical splice. Fiber optic cleavers are essential tools when splicing and putting connectors on in the field

Q3. What is the connector in Fibre optic?

An optical fiber connector is a flexible device that connects fiber cables requiring a quick connection and disconnection. Optical fibers terminate fiber-optic connections to fiber equipment or join two fiber connections without splicing

Section – C 03X03 = 09 Marks

Q1. What is difference between SC and LC?

This is one of the basic differences between these two connectors. The SC connector has a ferrule of 2.5mm while the LC features a 1.25mm ferrule which exactly half of the SC size. Because of the smaller size, LC is more commonly used in offices and data centres where there are clusters of Fiber Optic Cables

Q2. Explain media converter.

Media converters are flexible and cost-effective devices for implementing and optimizing fiber links in all types of networks. Media converters enable you to connect different types of media, such as twisted pair, fiber, and coax, within a network. The most widely used converters are probably the ones used to convert computers UTP Ethernet ports to fiber. This enables you the ability extend your Ethernet network beyond the 100-meter limit imposed by copper cable. Besides, some other converters also convert multi-mode to single-mode, convert analog signals to digital, multiplex several signals over one fiber pair, or perform other signal processing. In a word, as a device to converter one media to another, media converters are really working.

Q3. What is Principle of Optical Fiber Communication?

Optical fibers work on the principle of total internal reflection. When light ray strikes at the internal surface of optical fiber cable called such the incidence angle is greater than the critical angle, then incident light ray reflects in the same medium, and this phenomenon repeats.