Sheet No. (1)   **Subject: Fundamentals of networks**

1. What is the definition of IP network?

2. What is the abbreviation of IP?

3. What is the network importance?

4. What are the components of the network?

5. What is the abbreviation of the following: HTTP, FTP, SMTP, POP3?

6. What is the function of the following protocols: HTTP, FTP, SMTP, POP3?

7. What is the function of Telnet?

8. List the most famous manufacturers of network devices?

9. For a network topology: Mention with the explanation the types, the advantage and disadvantage of each topology and the most used topologies?

10. Mention with the explanation the network types according to area?

11. Draw an example of a LAN, MAN and WAN networks?

12. What are the types of cards used in LAN and WAN networks?

13. What is the speed of LAN network cards?

14. Mention some types of operating systems used in network end devices and intermediate devices?

15. Define the network model?

16. What is the difference between IOS and OSI?

17. Mention the OSI network layers explaining the function of each layer?

18. Compare between the OSI and the TCP/IP model?

19. What are the services provided by the application layer?

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Sheet No. (1): Fundamentals of networks   **Dr. Mohamed A. Abdelhamed**

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Course Name: Computer Networks (1)   **Code:** ECE 462, CCE 462 (2019 Reg.), ECE 491, CCE 491 (2013 Reg.)
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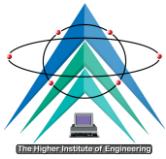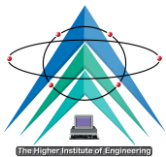**Academic Year:** 2023/2024   **Level:** Fourth Year   **Semester:** First

20. What are the protocols used in OSI and TCP/IP models?

21. Briefly explain how errors were detected in the transport layer, with an illustrative example of a problem that might occur during the data transmission process?

22. What is the difference between MAC address and IP address?

23. Compare between Hub, Switch and Router?

24. Mention the communication technologies used in LAN and WAN networks?

25. Recently, the statement that the world has become like a small village has been spreading. The key reason behind this statement is the ease of access and reaching the target not only on the small scale but it exceeds the borders of the countries. Networking is the secret behind this development and growth. In this context, Define the following terminologies:

    • Computer Network.

    • Network importance.

    • Network protocol.

26. The computer network is a facility for data communication between different parties, draw a simple Data Communication Network Model and state its components, then give a short note about each component.

27. Computer Network Protocols provide several services such as web browsing, file transfer (upload/download), send/receive E-Mail, Remote access apps…etc. Define the appropriate Computer Network protocols for the following services and discuss the scenarios for each Computer Network service.

    • Web Browsing,

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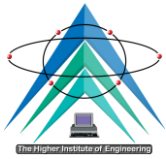**Academic Year:** 2023/2024   **Level:** Fourth Year   **Semester:** First

- File Transfer(upload/download),

- Send/Receive E-Mail,

- Remote Access,

- Real-time Applications.

28. Nowadays, we live in an era of digital conversion. Therefore, most enterprises construct and enhance their infrastructure to be compatible with this conversion. The enterprises' computer network and the enterprise devices' connections take primary importance in recent years. In this context, define the concept of network topology. State the different computer network topologies. Draw an example for each. State the number of cables used in each topology. List the advantages and disadvantages of each topology. Draw a hybrid topology with a hub backbone and three-ring networks.

29. There are various types of computer networks available. We can categorize them according to their size as well as their purpose. The size of a network should be expressed by the geographic area and number of computers, which are a part of their networks. It includes devices housed in a single room to millions of devices spread across the world. In this context, state the network categories according to the coverage area. State the different communication technologies used in these categories whether wired or wireless communication.

30. For data communication to take place and two or more users can transmit data from one to another, a systematic approach is required. This approach enables users to communicate and transmit data through efficient and ordered path. It is implemented using models in computer networks and are known as computer network models. In

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Academic Year: 2023/2024   **Level:** Fourth Year   **Semester:** First

this context, Define the meaning of the network model. What is the layer? why the network model is layered?
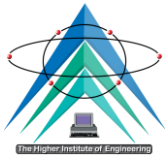
31. There are two computer network models on which the whole data communication process relies. Names these models, compare between these models, State the function of the following layers:

- Application layer
- Presentation layer
- session layer
- transport layer
- Network layer
- Data Link layer
- Physical layer

32. Each layer in the computer network model uses the protocol data unit (PDU) to communicate and exchange information added or removed by a layer, which can only be read by the peer layer on the receiving device and is then handed over to the next upper layer after stripping. State the PDU for each computer network layer.

33. What are the protocols used in the following TCP/IP model layer,

- Application layer
- transport layer
- Internet layer
- Network Interface layer

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Academic Year: 2023/2024   **Level:** Fourth Year   **Semester:** First

34. In the layer hierarchy as the data packet moves from the upper to the lower layers, headers are _____

   a) Added

   b) Removed

   c) Rearranged

   d) Modified
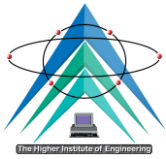
35. The structure or format of data is called _____

   a) Syntax

   b) Semantics

   c) Struct

   d) Formatting

36. Communication between a computer and a keyboard involves _____ transmission.

   a) Automatic

   b) Half-duplex

   c) Full-duplex

   d) Simplex

37. A _____ is the physical path over which a message travel.

   a) Path

   b) Medium

   c) Protocol

   d) Route

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38. Which of this is not a network edge device?

   a) PC

   b) Smartphones

   c) Servers

   d) Switch
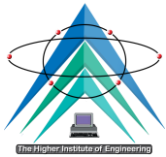
39. A _____ set of rules that governs data communication.

   a) Protocols

   b) Standards

   c) PCs

   d) Servers

40. Three or more devices share a link in _____ connection.

   a) Unipoint

   b) Multipoint

   c) Point to point

   d) Simplex

41. A _____ is a device that forwards packets between networks by processing the routing information included in the packet.

   a) bridge

   b) firewall

   c) router

   d) hub

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Academic Year: 2023/2024   **Level:** Fourth Year   **Semester:** First

42. Network congestion occurs _____

    a) in case of traffic overloading

    b) when a system terminates

    c) when connection between two nodes terminates

    d) in case of transfer failure

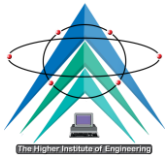43. The number of layers in ISO OSI reference model is _____

    a) 5

    b) 7

    c) 6

    d) 10

44. Which of the following layers is an addition to OSI model when compared with TCP IP model?

    a) Application layer

    b) Presentation layer

    c) Session layer

    d) Session and Presentation layer

45. Application layer is implemented in _____

    a) End system

    b) NIC

    c) Ethernet

    d) Packet transport

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Academic Year: 2023/2024 **Level:** Fourth Year **Semester:** First

46. Transport layer is implemented in _____

   a) End system

   b) NIC

   c) Ethernet

   d) Signal transmission

47. The functionalities of the presentation layer include _____
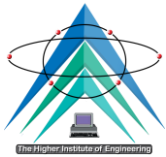
   a) Data compression

   b) Data encryption

   c) Data description

   d) All of the mentioned

48. Delimiting and synchronization of data exchange is provided by _____

   a) Application layer

   b) Session layer

   c) Transport layer

   d) Link layer

49. In OSI model, when data is sent from device A to device B, the 5th layer to receive

   data at B is _____

   a) Application layer

   b) Transport layer

   c) Link layer

   d) Session layer

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Academic Year: 2023/2024   **Level:** Fourth Year   **Semester:** First

50. In the OSI model, as a data packet moves from the lower to the upper layers, headers are _____

    a) Added

    b) Removed

    c) Rearranged

    d) Randomized

51. OSI stands for _____
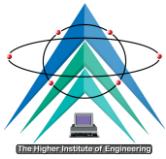
    a) open system interconnection

    b) operating system interface

    c) optical service implementation

    d) open service Internet

52. The number of layers in ISO OSI reference model is _____

    a) 4

    b) 5

    c) 6

    d) 7

53. TCP/IP model does not have _____ layer but OSI model have this layer.

    a) session layer

    b) transport layer

    c) application layer

    d) network layer

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Academic Year: 2023/2024   **Level:** Fourth Year   **Semester:** First

54. Which layer is used to link the network support layers and user support layers?

    a) session layer

    b) data link layer

    c) transport layer

    d) network layer

55. Which address is used on the internet for employing the TCP/IP protocols?

    a) physical address and logical address

    b) port address

    c) specific address

    d) all of the mentioned
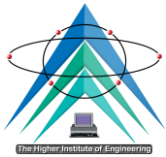
56. Which layer provides the services to user?

    a) application layer

    b) session layer

    c) presentation layer

    d) physical layer

57. Transmission data rate is decided by _____

    a) network layer

    b) physical layer

    c) data link layer

    d) transport layer

58. Which network topology requires a central controller or hub?

    a) Star

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Academic Year: 2023/2024   **Level:** Fourth Year   **Semester:** First

b) Mesh

c) Ring

d) Bus

59. _____ topology requires a multipoint connection.

a) Star

b) Mesh

c) Ring

d) Bus

60. Data communication system spanning states, countries, or the whole world is _____

a) LAN

b) WAN

c) MAN

d) PAN

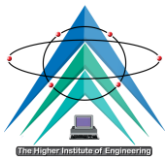61. Data communication system within a building or campus is_____

a) LAN

b) WAN

c) MAN

d) PAN

62. WAN stands for _____

a) World area network

b) Wide area network

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Academic Year: 2023/2024   **Level:** Fourth Year   **Semester:** First

c) Web area network

d) Web access network