

Assignment 03

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Section: 03

Course code: CSE320

Course title: Data Communication

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**Answer to the Question No. 01**

|  |  |  |
| --- | --- | --- |
| **Name** | **Functionality** | **PDU** |
| Application | Bridge between human and data network, provides services to the user. | Data |
| Presentation | Translates, compresses and encrypts data. | Data |
| Session | Initiates dialogue, keeps exchange of data active and restarts session which are disrupted of idle for a long period of time. | Data |
| Transport | Segmentation and reassembly, adds port address and sequence number, controls connection, flow and error. | Segments |
| Network | Routing, adds logical address. | Packets |
| Data link | Framing, physical addressing, controls flow, error and access. | Frames |
| Physical | Physical medium, data rate, synchronizes and represents bits. | Bits |

**Answer to the Question No. 02**

* Specific Address: Application Layer (Application, Presentation, Session)
* Port Address: Transport Layer
* IP (Logical) Address: Network Layer
* MAC (Physical) Address: Data Link Layer, Physical Layer

**Answer to the Question No.03**

|  |  |  |  |
| --- | --- | --- | --- |
| Address | Description | Layer  (OSI model) | Example |
| Specific | User friendly address, links to port, IP, MAC address. | Application | abc@gmail.com |
| Port | Identifies specific services running on a device. | Transport | 80 (for HTTP) |
| IP | Unique address assigned to a device which enables connection. | Network | 111.111.1.11 |
| MAC | Unique hardware address, given when the device was built. | Data link – Physical | 01.23.45.67.89.AB |

**Answer to the Question No.04**

|  |  |
| --- | --- |
| Protocol Data Units (PDU) | Size |
| Segment | 16 bits |
| Packet | 32 bits |
| Frame | 48 bits |

**Answer to the Question No.05**

Though Transport layer and Data-Link layer both have the error and flow control functionalities they have differences, likewise below:

|  |  |  |
| --- | --- | --- |
| Layers | Transport | Data link |
| Error Control | Finds and fixes errors from sending to receiving device. | Finds and fixes error in between two immediate connected devices. |
| Flow Control | Makes sure that sender doesn’t send overwhelming data to receiver at once. | Ensures fast devices don’t overload the slower one. |

**Answer to the Question No.06**

* De facto: Standards that have not been approved in papers and laws but have been adopted as a standard through widespread use. Means how things actually are.
* De jure: Standards that have been approved by the govern bodies. Means how things are supposed to be.

**Answer to the Question No.07**

**Protocols:** Protocols are a set of rules and regulations that defines how data are supposed to transited, receive, and processed in a network.

Protocol defines data type and format, addresses, flow and error control, session management, delivery, synchronization, and routing etc.

**Answer to the Question No. 08**

i. There are 8 networks in total. Hop-to-hop delivery means the transmission of data is flowing from one network to another. Data link layer of OSI model is responsible for this.

ii. Total 2 hops.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Frame 1 | D. MAC | S. MAC | D. IP | S. IP | D. Port | S. Port |
|  | J | K | j | k | 49152 | 80 |

**Answer to the Question No. 09**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Frame X | D. MAC | S. MAC | D. IP | S. IP | D. Port | S. Port |
| A | E | 20 | 24 | 80 | 52044 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Frame Y | D. MAC | S. MAC | D. IP | S. IP | D. Port | S. Port |
| E | F | 24 | 92 | 57150 | 25 |

**Answer to the Question No. 10**

* Application Layer
* Physical Layer
* Transport Layer
* Data Link Layer

**Answer to the Question No. 11**

i. There are total 10 networks.

ii.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Frame 1 | D. MAC | S. MAC | D. IP | S. IP | D. Port | S. Port |
| F | R | 16 | 19 | 49152 | 23 |

iii.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Frame 2 | D. MAC | S. MAC | D. IP | S. IP | D. Port | S. Port |
| G | R | 17 | 11 | 25 | 49153 |