

ITS413 – Quiz 5 Answers

Name: _____

ID: _____ Mark: _____ (out of 10)

Question 1 [2 marks]

A Voice over IP application samples the input voice signal at a frequency of 8kHz, with each sample represented by 6 bits.

- a) At what rate, in bits per second, is the voice data generated at? [0.5 mark]

Answer

8000 samples per second, with each sample 6 bits: 48000 bps or 48kbps

Other answers:

12kHz, 8 bits: 96kbps

Consider the overhead of VoIP. Assume the VoIP application generates packets that each contain 60 Bytes of voice data. Each packet has an additional 20 byte IP header, and 8 bytes of UDP header and 12 byte RTP header.

- b) What network throughput is required to deliver the voice data to the destination at the same rate at which it is generated at the source? [1.5 marks]

Answer

48kbps = 6000Bytes/s; 60 Bytes per packet means 100 packet per second.

Each packet has 40 bytes of header, meaning 100 packets per second where each packet is 100 Bytes.

Throughput required is 10,000 Bytes/sec = 80kb/s.

Other answers:

40 B data: 48kbps = 6000 B/s = 150 pkt/s → 12,000 B/s = 96kb/s

60 B data: 96kbps = 12000 B/s = 200 pkt/s → 20,000 B/s = 160kb/s

40 B data: 96kbps = 12000 B/s = 300 pkt/s → 24,000 B/s = 192kb/s

Question 2 [6 marks]

Fill in the blank spaces (1 mark each)

:

- a) Video applications can tolerate some _____, whereas web browsing applications cannot.

- b) A IP voice call (such as using Skype) is an example of _____ communications, whereas Youtube is an example of _____ communications.
- c) _____ are often used to reduce the effects of network jitter in streaming applications.
- d) In RTP, _____ can be used to convert from one data rate to another during a multimedia session.
- e) A common signaling protocol used in IP networks is _____ .
- f) For an IPTV access network, _____ is better than _____ because it delivers optical fibre closer to the user's home.

Answer

- a. errors or packet loss
 b. two way (or bi-directional); one way (or unidirectional)
 c. Playback buffers
 d. translation
 e. SIP, Session Initiation Protocol
 f. Fibre-to-the-Home is better than Fibre-to-the-Curb which is better than Fibre-to-the-Node.

Question 3 [2 marks]

Consider IP multicast versus using unicast to emulate a multicast network.

- a) Explain an advantage of multicast.

Answer

Multicast is more efficient, because the source only sends a single packet, whereas in unicast a source must send a packet for every destination.

Multicast is simpler for the source, in that it doesn't need to know about the destinations.

- b) Explain an advantage of using unicast to emulate a multicast network.

Answer

Unicast doesn't need complex protocols to perform multicast routing.