

S-72.1130 Telecommunication Systems

Close-books exam on 23rd of May, 2013

NOTE: Correct answer yields +1p, false -1p and unselected answer 0p

Return your answers in the supplied answer sheet

1. SONET Section Terminating Equipment takes care of add/drop functionalities.
2. In Time-Share the Crossbar Switch interconnection pattern of space switch is reconfigured for every time slot.
3. If TCP is used as the transport layer protocol, its build-in error detection and retransmissions can be used to recover from transmission errors and losses.
4. PCM telephony using TDMA (as E-1 or T-1) will reduce capacity of all users if they use more bitrate.
5. Line interface circuit converts between 4 and 2 wire connections.
6. Which one of the following effects is not one of the main contributors of fiber attenuation:
a: Scattering, b: Chromatic dispersion, c: Absorption
7. A 70 km standard single-mode fiber link requires an additional 10 km dispersion compensating fiber, to overcome the chromatic dispersion that occurs in the 1550 nm operating band (C-band). If the attenuation coefficients of the standard single-mode and dispersion compensating fibers are 0.2 dB/km and 0.3 dB/km, respectively, what is the gain of the optical amplifier required to compensate for the aggregate link loss.
a: 15 dB b: 17 dB c: 20 dB
8. Internet switches are transparent; hence hosts are unaware of their presence.
9. 3G/UMTS defines new interface: a: A interface between BSC and MSC, b: Uu interface between UE and eNodeB, c: Um interface between UE and eNodeB
10. MAC technology of IEEE 802.11 standard will reduce throughput of all users if they use more capacity.
11. Usage of point coordination function enables balancing between contention-free service and contention service.
12. Signaling system No.5, R1, R2 are flavors to common channel signaling
13. Short Inter Frame Spacing is intended for high priority frames in 802.11 medium access.
14. 10 Gigabit Ethernet PHY interface for multimode fibers supports links of up to 80 km, which is much longer than the few tens of meters possible for single-mode fiber links.
15. If the transmission channels in a communication networks would become virtually error-free, the data link layer would no longer be needed.
16. CRC is used to detect errors in a bit stream or in frames.
17. Physical carrier sensing refers to techniques that examine the physical properties of carriers especially in OFDM - systems.
18. Pulse stuffing requires that the stuffed bits are evenly distributed in input bit streams.

19. Usage of exponential back-off in DWFMAC reduces network congestion.
20. In bit stuffing extra bits are added to frames to avoid synchronization problems.
21. The process where too large layer n SDUs are divided into several layer n PDUs is known as blocking.
22. In 802.11, virtual carrier sensing takes place in radio interface monitoring received power.
23. The main physical reason for the fading is: a: Propagation environment, b: Temperature, c: Delay
24. The SGSN and GGSN are first time defined in a: 4G as part of the radio evolution, b: 3G as part of the IP based multimedia system, c: 2G to enable IP based communications based on GPRS.
25. IEEE 802.11 Direct Sequence Spread Spectrum (DSSS) is realized by using for instance Barker code.
26. Which one of the following is not an advantage associated with Coarse WDM: a: Optical amplification possible for all channels, b: Simple filter and transmitter designs, c: Reduced inter-channel interference due to wide channel spacing.
27. Echo cancellation circuits should be removed or disabled in data connections.
28. Consider the Clos multistage switch with $2n-1 < k$. This means that blocking will happen in the switch.
29. HDLC supervisory frame can be used to flow control.
30. The LLC SAP's job is to sort the up and coming MAC frames and direct them to the appropriate application or upper layer protocol.
31. When the efficiency of a typical random access MAC protocol approaches its maximum value, the average frame transfer delay increases.