

Assignment 6

1. c) To transmit signals across isolated circuits
2. c) LED and photodetector
3. b) They introduce delays due to the LED
4. b) LED
5. d) It emits light and detects changes in the reflected light
6. c) Object detection
7. d) When there is a change in reflected light intensity
8. d) Orange, Orange, Orange, Orange, Gold
9. c) Green, Black, Red, Gold
10. b) $56K \pm 5\%$
11. A flyback diode (also known as a freewheeling diode or snubber diode) is used to protect components in a circuit from voltage spikes that occur when an inductive load (such as a relay or motor) is turned off. When the current through the inductive load is abruptly interrupted, the magnetic field collapses, inducing a voltage spike in the opposite direction. The flyback diode provides a path for this induced current to flow in a loop, preventing voltage spikes that could damage other components. It works by allowing the current to circulate through the diode, effectively "catching" the energy and dissipating it harmlessly.
12. The equivalent resistance of resistors in parallel is 445.625
13. a) High logic level (1).
14. b) Segments a, b, c, d, e, and f.
15. c) To control the flow of data onto a bus.
16. 20Ω .
17. $R = 0.5 \Omega$.

Chapter 6.1

1. c) Switch
2. b) Router
3. d) Broadcasting incoming data to all connected devices
4. b) Switch
5. c) To convert digital data to analog signals for transmission over telephone lines
6. c) Firewall
7. c) To amplify and extend network signals
8. b) To connect different network segments
9. d) It filters traffic based on MAC addresses
10. b) Bridges connect different network segments, while switches connect devices within the same segment
11. c) To amplify and extend network signals
12. c) Between two network segments
13. c) Physical Layer
14. c) both a and b (Analog signal and Digital signal)
15. c) They can introduce noise and interference to the signal
16. C) Connecting different types of networks
17. B) IPv4 and IPv6
18. B) A dedicated circuit is established between the sender and receiver
19. D) It guarantees a constant transmission rate
20. C) More efficient use of network resources
21. C) Through multiple switches and routers
22. B) Parallel transmission
23. B) Serial transmission requires fewer lines than parallel transmission
24. D) Ring topology
25. B) Star topology
27. B) To translate domain names to IP addresses
28. A) To identify the network portion of an IP address
29. B) A subnet mask of 255.255.255.0
30. A) 14