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Computer Science & Engineering

An Assignment -2

Course Code: CSE 335

Course Title: Data Communication

Submitted to:

Tarikuzzaman Emon

Assistant Professor

Department of Computer Science and Engineering

Submitted by:

Name: Seafat Hossain

Student ID: CSE0728259

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Assignment-2

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Ans: to the Ques No:-1

Yes, a routing table in a datagram network can have two entries with the same destination address if there are multiple paths to reach that destination. Each entry would correspond to a different path, allowing for redundancy, load balancing, or policy-based routing.

Ans: to the Ques No:-2

I. No, it's unlikely for a switching table in a virtual-circuit network to have two entries with the same input port number because each entry typically corresponds to a unique input port.

II. Yes, it's possible for a switching table in a virtual-circuit network to have multiple entries with the same output port number, especially when multiple virtual circuits share the same output port.

Ans: to the Ques No:-3

Overseas calls have a slight delay due to two main reasons:

1. **Distance:** The signal still travels a long way, even though it might be on fiber optic cables most of the time. These cables transmit data at high speeds, but not quite the speed of light.
2. **Network Hops:** The signal gets passed between multiple routers and switches as it travels across different networks. Each hop adds a tiny bit of delay.

Ans: to the Ques No:-4

For both incident angles:

I. Incident angle = 40° Since the incident angle (40°) is less than the critical angle (60°), refraction occurs. The light ray bends towards the normal as it enters the less dense medium.

II. Incident angle = 60° Since the incident angle (60°) equals the critical angle, the light ray travels along the interface between the two mediums. This phenomenon is known as total internal reflection.

Ans: to the Ques No:-5

To calculate the minimum number of bits required for a PN sequence in Frequency Hopping Spread Spectrum (FHSS), we need to consider the relationship between the channel bandwidth (B), the spread spectrum bandwidth (Bss), and the chipping rate (R).

The chipping rate (R) is given by the formula:

$$R = \frac{Bss}{B}$$

In this case, the channel bandwidth (B) is 4 kHz and the spread spectrum bandwidth (Bss) is 100 kHz, so:

$$R = \frac{100\,\text{kHz}}{4\,\text{kHz}} = 25$$

Now, to calculate the minimum number of bits required for a PN sequence, we use the formula:

$$N = \log_2(R)$$

Where N is the number of bits.

Using the chipping rate (R) calculated above:

$$N = \log_2(25)$$

$$N \approx 4.6439$$

Since the number of bits must be an integer, we round up to the next whole number:

$$N \approx 5$$

So, the minimum number of bits in a PN sequence for FHSS with the given channel bandwidth and spread spectrum bandwidth is 5 bits.