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Tutorial 6

Guided Media

- The signal energy propagates through wires in guided media.
- Guided media is used for point to point communication.
- Discrete network topologies are formed by the guided media.
- Signals are in the form of voltage, current or photons in the guided media.

Unguided Media

- The signal energy propagates through air in unguided media.
- Unguided media is generally suited for radio broadcasting in all directions.
- Continuous network topologies are formed by the unguided media.
- Signals are in the form of electromagnetic waves in unguided media.

Ans 2: Cladding is provided to the Fibre Optic Cable to provide a lower refractive index surface for the core so that the light can undergo Total R Internal Reflection and get transmitted through the core.

Ans 3: Given,

- The frame carries 4 bits from each of the first two sources and 3 bits from each of the second two sources.

a) Frame size = $4 \times 2 + 3 \times 2 = 14$ bits.

b) Each frame carries 4 bits from each 200 kbps source or 3 bits from each 150 kbps. Frame rate = $\frac{200000}{4} = \frac{150000}{3}$

= 50000 frames/s.

c) Frame duration = $\frac{1}{\text{Frame rate}}$ = 20μs.

d) Output data rate = 50000 × 14 = 700 kbps.

Ans 4: Given,
No. of sources = 14
No. of bits per second = 500 × 8 = 4000 bps.
No. of slots = 6

We also need to add 4 bit addresses to slot.

a) Frame size = 6 × (8 + 4) = 72 bits.

b) Output frame rate is assumed to have only 6 lines. Each frame sends one character. Hence,
Output frame rate = 500 fps.

c) Frame duration = $\frac{1}{\text{Frame rate}}$ = 2ms

d) Data rate = 500 fps × 72 = 36 kbps

Given,

Bandwidth = 4 kHz

B_{ss} = 100 kHz.

Using frequency Hopping Spread Spectrum,

Number of hops = $\frac{100}{4}$ = 25 kHz.

$\log_2 25 = 4.64 \approx$ 5 bits