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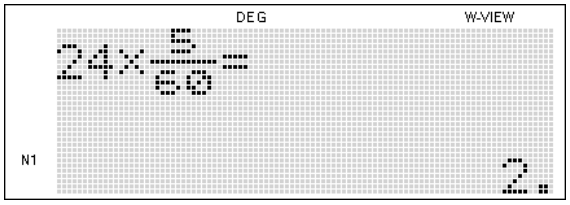
ELEX 4550

MID-TERM EXAM SOLUTIONS

Q.1 6 trunks

$$\text{offered load} = \frac{24 \text{ calls}}{\text{hour}} \times 5 \text{ minutes/call} \times \frac{1 \text{ hours}}{60 \text{ minute}}$$

$$= 24 \times \frac{5}{60} = 2$$



from Erlang-B table intersection of curve for offered load = 2 and # trunks = 6 is at

Blocking probability ≈ 0.01 (1%).

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Q.2

7E FF 03 41 01 02 7D 5D 40 FF FF 7E

from Lecture 15: first 3 bytes (7E FF 03) are flag, address and control.

the last 3 bytes are FCS & flag (FF FF 7E).

this leaves:

41 01 02 7D 5D 40

the LS bit of the first byte (41) is '1' so the protocol field is 8 bits. (41)

The remaining bytes are the payload:

01 02 7D 5D 40

but the escape character 7D indicates an escape sequence. The second byte must be XOR'ed with 0x20:

$$\begin{array}{r} 5D \\ 20 \\ \hline 7D \end{array} = \begin{array}{r} 0101\ 1101 \\ \oplus\ 0010\ 0000 \\ \hline 0111\ 1101 \end{array}$$

Thus the payload is:

01 02 7D 40

answers:

(a) the protocol is 0x41

(b) the payload is 01 02 7D 40 (hex)

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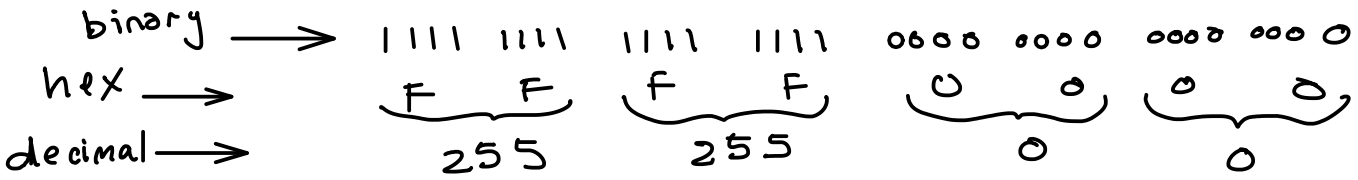
Q.3

to route packets for the 10.0.0.0/16 network, the entry in the routing table needs the destination address 10.0.0.0 and a netmask for a /16 network.
the netmask for a /16 network has the 16 M.S. bits set to '1' & the rest set to zero:



There is no gateway because this is not a default route.
The interface value is the IP address of the interface connecting R1 and R3.
From the diagram this is 10.0.0.1

Thus the routing table entry would be:

destination	mask	gateway	interface
10.0.0.0	255.255.0.0	*	10.0.0.1

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