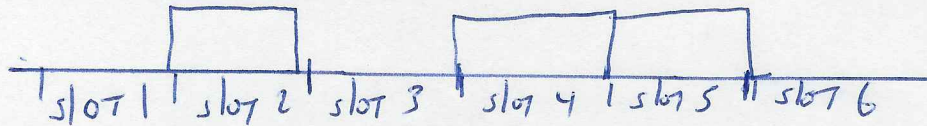


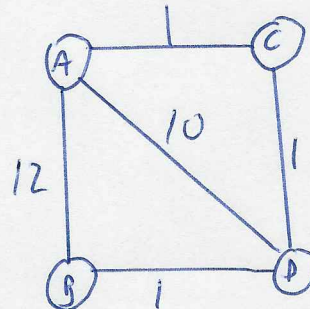
NAME: _____ Circle: ESE or CS/IS
Midterm ESE/CSE 346 T. Robertazzi Spring 2018

Answer all questions. Total is 20 points: Q1:6 pts, Q2: 4 Pts, Q3: 5 pts, Q4 5pts. Show any work.

1. Consider the following 6 time slots of a packet stream. Let p be the independent probability of a packet in a slot and $1-p$ be the independent probability of no packet in a slot.



- (a) Write an expression for the probability of the exact sequence shown in the diagram above occurring.
- (b) Write an expression for the probability (with an infinite number of slots) of the 1st packet occurring in the i th slot followed by a second packet in the $i+1$ st slot.
- (c) Write an expression for the probability of 2 packets occurring in six slots in any order.
2. Let node A be the root. Find the algorithm table of the Ford Fulkerson algorithm using shortest path routing. Label the columns B C D.
Use pointers!



3. Let the following be a 4B5B encoded stream.

4B5B Stream: 01001 10100 11110

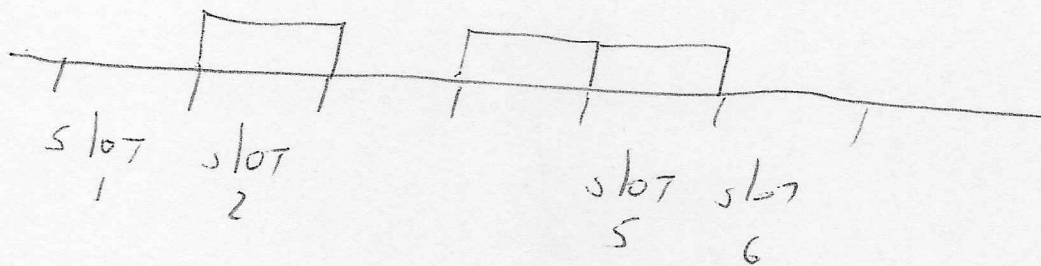
Binary:

Decimal:

- (a) Find the corresponding binary stream.
- (b) Find the decimal number it represents (hint: it is our class size).

4. Let a message be 0100. Find the Hamming code check bits. Show work!

1.

6pc

$$(a) P_{ns}(\text{seg in diagram}) = (1-p)^3 p^3$$

$$(b) \text{Prob}(k \text{ packets in slot } i, \text{ and } j \text{ packets in slot } i+1) = (1-p)^{i-1} p p = (1-p)^{i-1} p^2$$

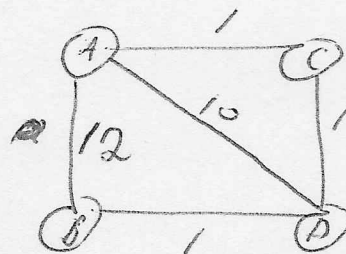
$$(c) P(2 \text{ packets in 6 slots in any order}) = \binom{6}{2} p^2 (1-p)^4$$

2.

4pc

FORD - FULKERSON

	B	C	D
1	(A, 1) (A, 2)	(A, 1)	(C, 2)
2	(A, 3)	(A, 1)	(C, 2)
3	(A, 3)	(A, 1)	(C, 2) ← stop
4			



3.

4558

01001

10100

11110

BINARY

0001

0010

0000

DECIMAL

1

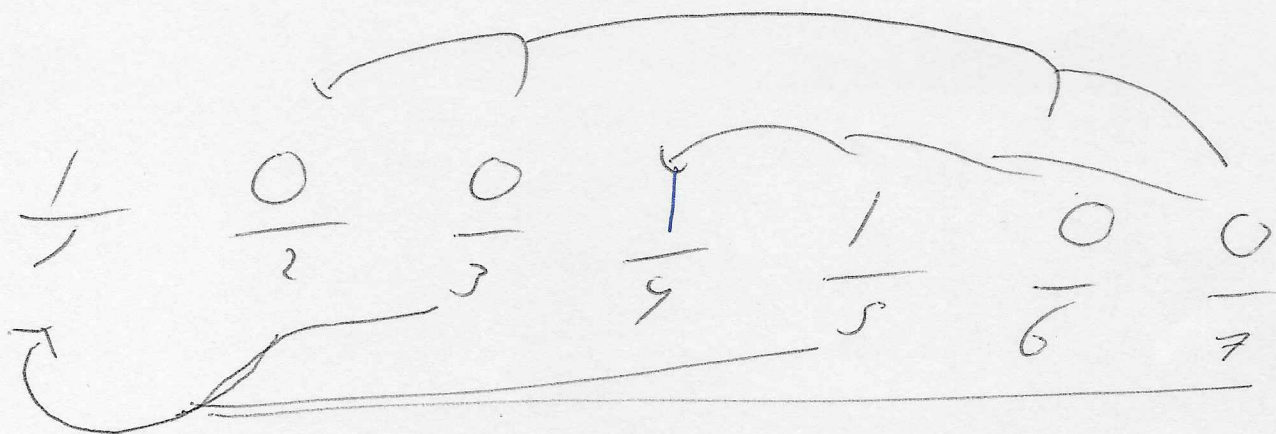
2

0

100 class was site

4.

0100 merge



check site: 1 0 /