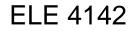
ELE	41	42
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1) Assuming a 2Tb/in<sup>2</sup> areal density on a HDD platter, with a 3 to 1 width to length ratio of a bit and 40% spacing on each side(40% of the width) – calculate the length and width of a bit in nm. 15pts



Name\_\_\_\_\_

2) Your (2,7) RLL decoder generated the following data stream, provide the decoded bit stream in HEX 15 pts

## 

3a) Describe what Write-Wide, Read-Narrow means and why we would use it 5 pts

3b) Why do HDDs need to use RLL codes?

ELE 4142

3c) What mechanism prevents head slaps in normal rotating operation of a HDD

5 pts

5 pts

HW5

Name

ELE 4142

Name\_

4) Calculate the best case and worst case read delay for the following DVD player 20 pts

Sled radial speed – 1mm/ms Total sled read travel distance - 7.5cm Disk rotation speed 5600 rpm Radius at inside track – 0.4inches Read channel delay (electronics) – 150us HW5

Name\_\_

5) Search and Think

25 pts

Propose a circuit to measure the output of a GMR HDD sensor Keep it simple – (if you use a Wheatstone Bridge you must document how you intend to determine the bit value and bias the sensor) HW5

Name\_\_\_\_\_

6) Search and Think

10pts

Provide a short description of HAMR as it applies to Hard Disk Drives