South Dakota School of Mines and Technology
Department of Materials and Metallurgical Engineering

Met 352 SPC

1. The results below were obtained from sampling six chisels a day from a heat treatment facility.

   a) Construct a Mean Control Chart
   b) Construct a Range Control Chart
   c) Is the production of chisels under control?
   d) Is the length of any run suspect?
   e) Is the number of runs suspect?

n	Hardness Values	Mean Hardness	Hardness Range
1		72	5
2		68	3
3		67	6
4		71	2
5		72	3
6		69	1
7		71	8
8		73	5
9		67	6
10		72	3
11		71	4
12		68	2
13		69	7
14	67, 69, 73, 71, 68, 74		
15	65, 73, 71, 67, 74, 69		
16	62, 69, 72, 71, 67, 74		
17	73, 71, 67, 74, 69, 69		
18	64, 69, 73, 72, 68, 75		
19	62, 68, 74, 71, 67, 74		
20	61, 69, 76, 74, 67, 71		

2. The 'melting point' of an alloy used for fuse links must be 181±2.1 °C. Sampling has determined the mean 'melting point' to be 180.1 °C with a standard deviation of 0.32 °C. Adjustments in alloy composition can continuously change the 'melting point' results.
   a) Is the process capable of making fuses that could be considered as meeting high precision standards?
   b) Is the process now meeting the high precision standards?