KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICS AND STATISTICS
Term 123

STAT 319 Statistics for Engineers and Scientists

Second Major Exam Sunday July 7, 2013

Please check/circle your instructor's name

□ Anabosi □ Jabbar □ Al-Sabah □ Saleh □ Alsawi

Name: _____ ID #: _____Section# _____

☺ Important Note:

Show all your work including formulas, intermediate steps and final answer.

Question No	Full Marks	Marks Obtained
1	10	
2	6	
3	3	
4	4	
5	7	
Total	30	

1) The time t, in minutes, that 45 workers needed to assemble computers were registered. The following frequency distribution was obtained.

Class	frequency
$20 \leq t < 24$	3
$24 \leq t < 28$	21
$28 \leq t < 32$	12
$32 \leq t < 36$	6
$36 \leq t < 40$	2
$40 \leq t < 44$	1

a) Find the percentage of workers that need at least 32 minutes to assemble the computer. *(2pts)*

b) Graph the histogram for this frequency distribution, and comment on its shape. *(4pts)*

c) Approximate the mean and the variance. *(4pts)*

2) An experiment to test the strength (in kN) of tubes gave the following results

96	102	102	102	104	104	108	110	126
126	128	128	140	142	148	164	180	

a) Construct a box plot and comment on its shape *(6pts)*

3) A production company's 3500 part-time employees average 37.6 years of age, with a standard deviation of 8.3 years. If a random sample of 49 part-time employees is taken, what is the probability that the sample will have an average age of less than 40 years? *(3pts)*

4) You select a random sample of 1600 tires from an on-going production process in which 8% of all such tires produced are defective. Approximate the probability that 150 or fewer tires will be defective? *(4pts)*

5) The length of a part in a production process is normally distributed with a mean of 90.2 mm and a standard deviation of 0.1 mm.
   a) What is the probability that a part is longer than 90.352 mm? *(2pts)*

   b) If customer requirements specify a length of 90.2 ± 0.2 mm, what percentage of the product satisfy the requirements? *(2pts)*

   c) If a 5% of the shortest parts are destroyed, what is the minimum acceptable length of the part? *(4pts)*