MTH210 Final Exam Sample **Name:**
Duration: 120 minutes **Point: /100**

Your birthday: **dd/mm**

Let **d**= sum of digits of **dd** and **m**=sum of digits of **mm**.

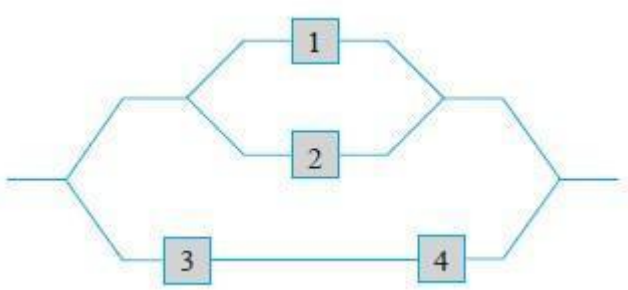
Question 1. (10 points) The weights of certain machine components are normally distributed with a mean of (80+**m**) g and a standard deviation of **d** g. Find the two weights that separate the top **d**% and the bottom **m**%. (*Theses weights could serve as limits used to identify which components should be rejected.*)

Question 2. (10 points) A study of the amount of time it takes a mechanic to rebuild the transmission for a new model of Chevrolet Cavalier shows that the mean is (8 + 1/**d**) hours and the standard deviation is (2 – 1/**m**) hours. If 40+**m** mechanics are randomly selected, find the probability that their mean rebuild time is less than (8- 1/**d**) hours.

Question 3. (10 points) In a survey of 5400 T.V. viewers, 30% said they watch network news programs. Find the margin of error for the 95% confidence interval used to estimate the population proportion.

Question 4. (10 points) A laboratory tested 80+**m** chicken eggs and found that the mean amount of cholesterol was 200+**m** milligrams with the standard deviation s = (10 + **d**/10) milligrams. Construct a (90+**m**) percent confidence interval for the true mean cholesterol content, μ, of all such eggs.

Question 5. (10 points) Consider the system of components connected as in the accompanying picture. Components 1 and 2 are connected in parallel, so that subsystem works iff either 1 or 2 works; since 3 and 4 are connected in series, that subsystem works iff both 3 and 4 work. If components work independently of one another and
P(component 1 works) = *P*(component 2 works) = 1-**d**/40
P(component 3 works) = *P*(component 4 works) = 1-**m**/20
Calculate *P*(system works).



Question 6. (10 points) A recent study indicated that (20+**d**)% of the 100**m** women over age 55 in the study were widows.
a. How large a sample must you take to be (90+**m**)% confident that the estimate is within **m**/200 of the true proportion of women over age 55 who are widows?
b. If no estimate of the sample proportion is available, how large should the sample be?

Troy University Resources

Using data: https://docs.google.com/spreadsheets/d/1tfGZLMuc5XasBjfiTDcIZakoGuQ-oL1cPw4f8lhFIQY/edit?usp=sharing
For 2 question 7 & 8.

Question 7. (20 points) Find the equation for this data in 2 models:

a) Linear

b) Quadratic

Choose the better model and predict the next 5 values.

Question 8. (20 points) Given the time-series (in quarter) in the data. Find the model and predict the next 4 values.