

MATH 130

Study Guide for Exam 3, Chapters 7, 8 and 15

This is a list of topics that could be used to generate questions for Exam 3. Pages and questions from the text are included, but be sure to also study the types of problems from the online material.

- Chapter 7: Trees
 1. Know the following vocabulary terms: (page 220)
 - network
 - weighted network
 - tree
 - subtree
 - spanning tree
 - minimum spanning tree
 2. Identify networks. (pages 208-209, questions 1-2 page 221)
 3. Identify trees. (pages 210-211)
 4. Calculate the degree of separation between two vertices. (pages 208-209, questions 3-6 pages 221-222)
 5. Apply the following properties to determine if a network is a tree: (pages 210-211, questions 7-20 page 222)
 - (a) single-path property
 - (b) all-bridges property
 - (c) $N - 1$ edges property
 6. Calculate the redundancy of a network. (pages 211-212, questions 21-24 pages 222-223)
 7. Find a spanning tree of a network. (pages 213-215, questions 21-30 pages 222-224)
 8. Apply Kruskal's Algorithm to find a minimum spanning tree (MST). (pages 215-219, questions 31-36 page 224 and questions 41-42 page 225)

• Chapter 8: Scheduling

1. Know the following vocabulary terms: (page 249)

– processor	– finishing time	– arc
– task	– optimal schedule	– arc set
– processing time	– optimal finishing time	– priority list
– precedence relation		– critical path
– independent task	– digraph	– critical time
2. Interpret digraphs. (pages 234-236, questions 1-6 pages 250-251 and questions 15-17 page 252)
3. Draw a digraph from a description. (questions 7-8, 13-14 pages 251-252 and questions 19-26 pages 253-254)
4. Interpret priority lists and schedules. (pages 236-239, questions 27-34 pages 254-255)
5. Calculate the number of possible priority lists. (page 237)
6. Schedule a project on 2 or 3 processors using a project digraph and a priority list. (pages 240-241, questions 35-40 page 255)
7. Decreasing Time (pages 242-244, questions 41-48 pages 255-256)
 - (a) Create a decreasing time priority list.
 - (b) Schedule a project using the decreasing time algorithm.
8. Critical Time (pages 244-248, questions 49-56 pages 256-257)
 - (a) Compute the critical times for tasks using the backflow algorithm.
 - (b) Find the critical path for a vertex, and for the entire project.
 - (c) Find the optimal finishing time.
 - (d) Create a critical time priority list.
 - (e) Schedule a project using the critical-path algorithm.
 - (f) Determine if a schedule is optimal.

• Chapter 15: Graphs, Charts and Numbers

1. Know the following vocabulary terms: (page 467)

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|-----------------------|--------------------------------------|-----------------------|
| – data set | – line graph | – quartiles |
| – data point | – categorical (qualitative) variable | – five-number summary |
| – discrete variable | – piechart | – box plot |
| – continuous variable | – average (mean) | – range |
| – actual value | – percentile | – interquartile range |
| – bar graph | – locator | – variance |
| – frequency table | – median | – standard deviation |
| – pictogram | | |

2. Represent a data set using one of the following: (pages 454-456, questions 1,2,4,5,6 on page 469)

- bar graph
- frequency table
- line graph
- pie chart

3. Interpret a bar graph, frequency table, line graph or pie chart. (questions 11,13 and 14 page 470)

4. Interpret a pictograph and understand how scaling can be used to influence the interpretation. (pages 451-452, questions 17,18 page 471)

5. Compute the average (mean) and median from a data set or frequency table. (pages 458 and 459, questions 23-30 page 472)

6. Compute quartiles and percentages from a data set. (pages 459-462, questions 33-40 on pages 472 and 473)

7. Compute a five-number summary and draw a box plot from a data set. (pages 462-464, questions 41-46 on page 473)

8. Compute the range and interquartile range from a data set. (page 464, questions 47-50 on pages 473 and 474)

9. Compute the standard deviation given a data set. (page 46, questions 55-58 on page 474)