NAME : _____

Exam 2, Version A, Math 105 Exam A

7 March 2013

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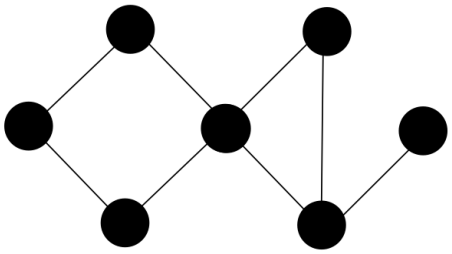
Instructions:

- This is a closed book, closed notes exam.
- You are not to give or receive help from any outside source during the exam.
- Calculators are permitted, but only for calculations, NOT FOR STORING FORMULAE OR OTHER INFORMATION.
- You have **50 minutes**.
- The exam is MULTIPLE CHOICE. Please use the scantron sheet which has been provided.

1. If a tree has 10 bridges, how many vertices does it have?

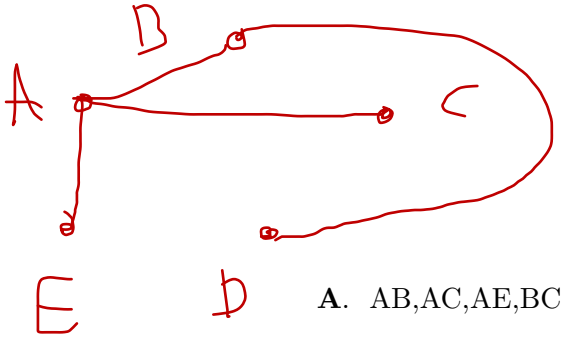
A. 8 **B**. 9 **C**. 10 **D**. 11 **E**. None of these

2. In the network shown below, how many different spanning trees are there?



A. 4 **B**. 7 **C**. 12 **D**. 16 **E**. None of these

3. The mileage chart below shows the distances between vertices A, B, C, D, and E. Use Kruskal's algorithm to find the minimum spanning tree connecting the vertices.



	A	B	C	D	E
A		2	3	9	4
B	2		5	8	6
C	3	5		18	12
D	9	8	18		11
E	4	6	12	11	

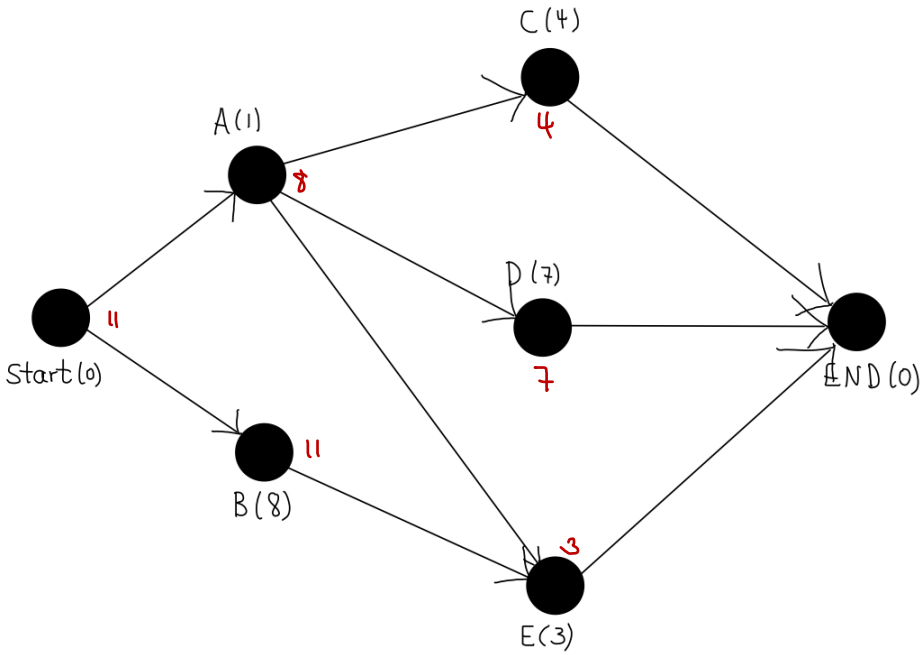
A. AB,AC,AE,BC **B**. AB,AC,BD,BE **C**. AD, AE, AB,AC

D. AB,AC,AE, BD **E**. None of these

4. The critical time of a project is the theoretical time barrier below which a project cannot be completed, regardless of how clever the scheduler is or how many processors are used.

A. True B. False

5. For the project described by the project digraph shown below, what is the critical time of the project?



A. 4 **B**. 8 **C**. 11 **D**. 19 **E**. None of these

6. For the above project digraph, the priority list is A,B,C,D,E. If there are two processors, what is processor P2's second task?

A. Task A **B**. Task B **C**. Task C **D**. Task D **E**. Task E

7. For the project digraph above, what is the critical time for vertex A?

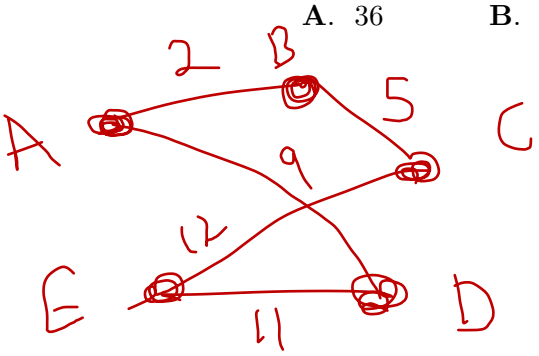
A. 1 **B**. 5 **C**. 7 **D**. 8 **E**. None of these

Ulysses McGill must plan a trip. He lives in A and must visit cities B, C, D, E, and return to A (the order in which they are visited is not important). The transportation costs are shown in the tale below.

	A	B	C	D	E
A		2	3	9	4
B	2		5	8	6
C	3	5		18	12
D	9	8	18		11
E	4	6	12	11	

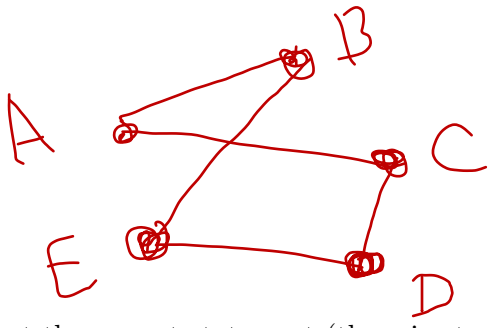
8. In an extreme rush, Ulysses applies the nearest neighbor algorithm, *starting at A*. What is the cost of his trip?

A. 36 **B**. 20 **C**. 40 **D**. 39 **E**. None of these



9. Find the route by using the Cheapest Link Algorithm. Once you have the route, use it starting at A. What is the third edge which is crossed?

A. AB **B**. AC **C**. DE **D**. AE **E**. None of these



10. Select the correct statement (there is at most one.)

A. The cheapest link algorithm for the traveling salesman problem always produces the optimal route.
B. The brute force algorithm for the traveling salesman problem always produces an optimal route.
C. Kruskal's algorithm always produces the optimal route for the traveling salesman problem.
D. The repetitive nearest neighbor algorithm for the traveling salesman problem always produces the optimal route.
E. None of these are correct.

A project consists of 4 tasks, labeled A through D. The processing times and precedence relations for each task are given in the following table.

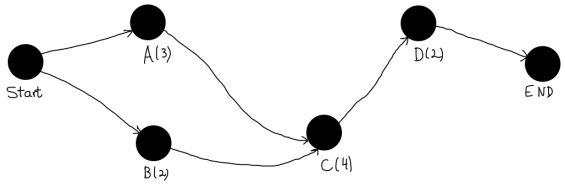
Task	P-time	Precedent Tasks
A	3	
B	2	A
C	4	A,B
D	2	B,C

11. Which task can be started immediately?

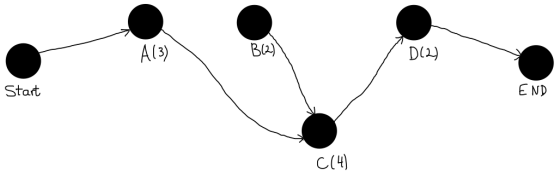
A. A **B**. B **C**. C **D**. D **E**. None of these can be started first

12. Which digraph represents the project?

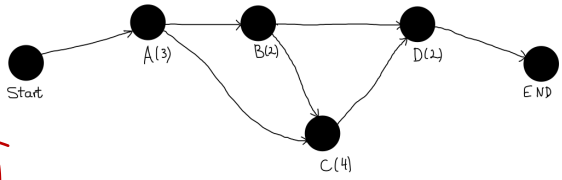
A.



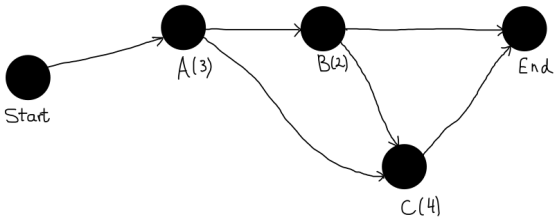
B.



C.



D.



E. None of these.