Key with answers

MATH130 EXAMINATION 3, SPRING 2015, VERSION A

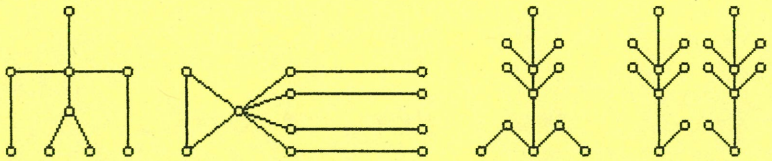
Name_____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Solve the problem.

1) A tree is 1) D
A) any graph that has no circuits.
B) any graph with one component.
C) any graph that has no bridges.
D) any graph that is connected and has no circuits.
E) none of these

2) Which of the following four graphs is a tree? 2) A



Graph 1 Graph 2 Graph 3 Graph 4

A) Graph 1 and Graph 3
B) Graph 2 and Graph 3
C) Graph 2 and Graph 4
D) Graph 1 and Graph 4
E) none of these

3) The number of edges in a tree with 49 vertices is 3) A
A) 48.
B) 2^{49}.
C) 49.
D) 50.
E) none of these

# of vertices − 1 = # of edges
49 − 1 = 48

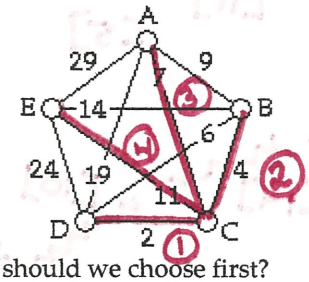
4) The number of vertices in a tree with 57 edges is 4) C
A) 2^{57}.
B) 57.
C) 58.
D) 56.
E) none of these

# of vertices = # of edges + 1
58 = 57 + 1

5) Suppose T is a tree with 21 vertices. Then 5) B
A) T can have any number of bridges.
B) T has 20 bridges.
C) T has one bridge.
D) T has no bridges.
E) none of these

21 vertices → 20 edges
In a tree, all edges are bridges
→ 20 bridges.

The question(s) that follow refer to the problem of finding the minimum spanning tree for the weighted network shown below.



6) Using Kruskal's algorithm, which edge should we choose first? 6) C

A) AC
B) BC
C) CD
D) BD
E) none of these

Choose the cheapest edge first.

7) Using Kruskal's algorithm, which edge should we choose second? 7) D

A) CD
B) AC
C) BD
D) BC
E) none of these

Choose the next cheapest edge.

8) Using Kruskal's algorithm, which edge should we choose third? 8) B

A) CD
B) AC
C) BC
D) BD
E) none of these

etc...

9) Which of the following edges of the given network are not part of the minimum spanning tree? 9) C

A) AC
B) CD
C) BD
D) BC
E) none of these

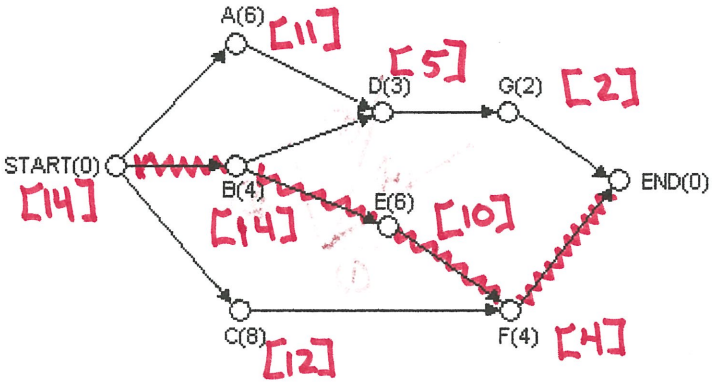
BD would make a circuit and trees do not have circuit!

10) The total weight of the minimum spanning tree is 10) B

A) 26
B) 24
C) 125
D) 68
E) none of these

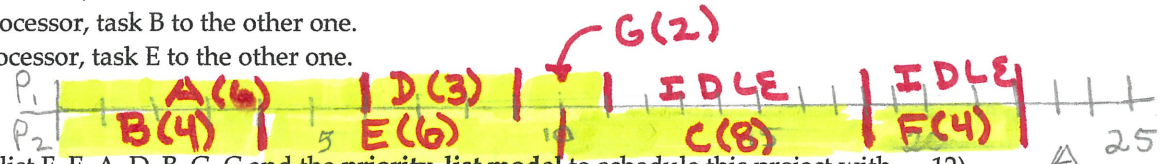
2 + 4 + 7 + 11 = 24

Suppose you have the following project digraph. (The numbers in parentheses represent hours.)



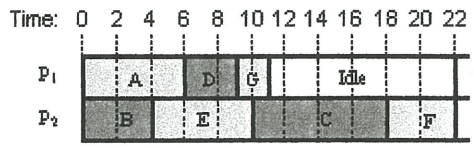
11) If we use the priority list F, E, A, D, B, G, C and the **priority-list model** to schedule this project with two processors, we should start by assigning 11) C

A) task B to one processor, task C to the other one.
B) task A to one processor, task C to the other one.
C) task A to one processor, task B to the other one.
D) task B to one processor, task E to the other one.
E) none of these

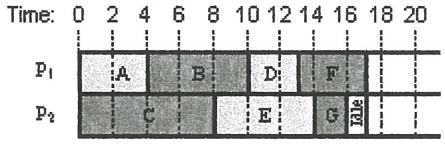


12) If we use the priority list F, E, A, D, B, G, C and the **priority-list model** to schedule this project with two processors, the project timeline is 12) A

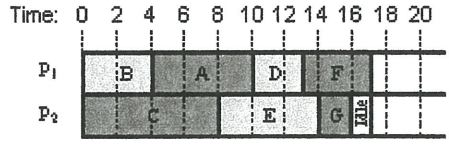
A)



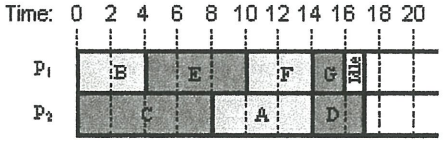
B)



C)



D)



13) If we use **decreasing-time algorithm** to schedule this project with two processors, we should start by assigning 13) A

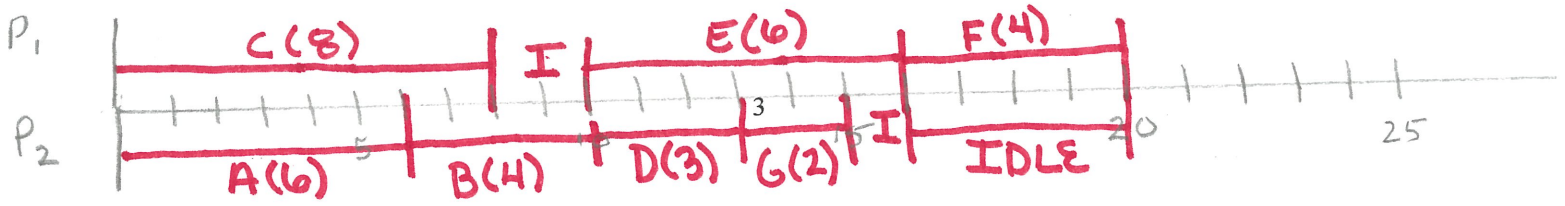
A) task A to one processor, task C to the other one.
B) task B to one processor, task E to the other one.
C) task A to one processor, task B to the other one.
D) task B to one processor, task C to the other one.
E) none of these

Look inside the ( )s for times. Put in decreasing order.
C(8), A(6), E(6), B(4), F(4), D(3), G(2)

14) Using the **decreasing-time algorithm** to schedule this project with two processors, the project finishing time is 14) B

C, A, E, B, F, D, G

A) 18 hours.
B) 20 hours.
C) 17 hours.
D) 19 hours.
E) none of these



15) The length of the critical path of this project digraph is 15) C

A) 11 hours.
B) 16 hours.
C) 14 hours.
D) 12 hours.
E) none of these

Look inside the [ ]s for the critical times.

16) If we use the **critical-path algorithm** to schedule this project with two processors, we should start by assigning 16) A

A) task B to one processor, task C to the other one.
B) task A to one processor, task C to the other one.
C) task A to one processor, task B to the other one.
D) task B to one processor, task E to the other one.
E) none of these

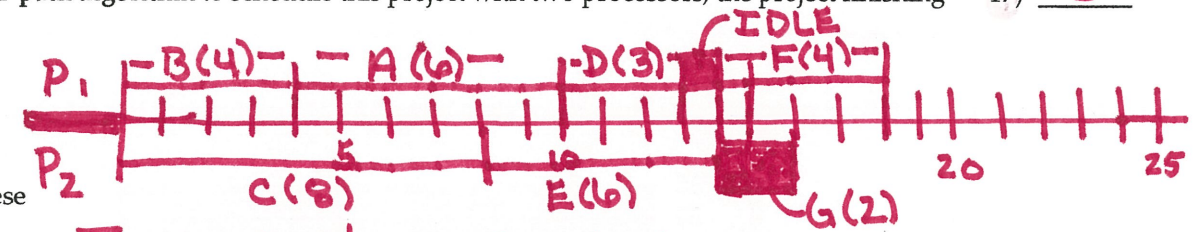
this one

order the critical numbers in decreasing order.

B[4], C[8], A[6], E[6], D[3], F[4], G[2]
12

17) Using the **critical-path algorithm** to schedule this project with two processors, the project finishing time is 17) D

A) 17 hours.
B) 20 hours.
C) 19 hours.
D) 18 hours.
E) none of these



I messed up. See below.

Solve the problem.

18) The data below gives the eye colors of 20 students in a Statistics class. Make a frequency table for the data. 18) A

green	blue	brown	blue	blue
brown	blue	blue	blue	green
blue	brown	blue	brown	brown
blue	brown	blue	blue	blue

A)

Color	Green	Brown	Blue
Frequency	2	6	12

B)

Color	Green	Brown	Blue
Percent	10%	30%	70%

C)

Color	Green	Brown	Blue
Frequency	6	12	2

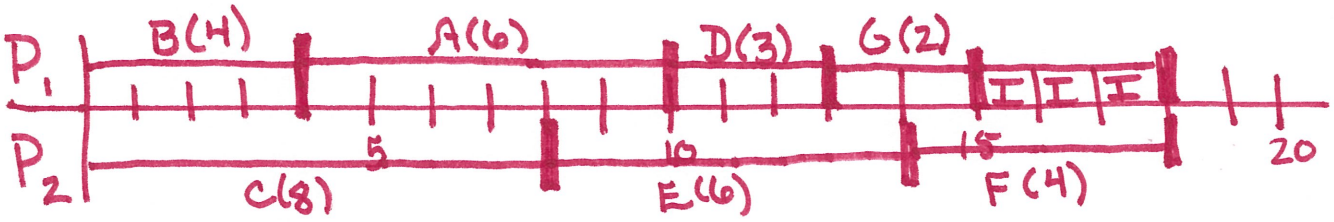
D)

Color	Green	Brown	Blue
Frequency	2	8	20

E)

Color	Green	Brown	Blue
Frequency	6	2	12

B, C, A, E, D, F, G



This is better.

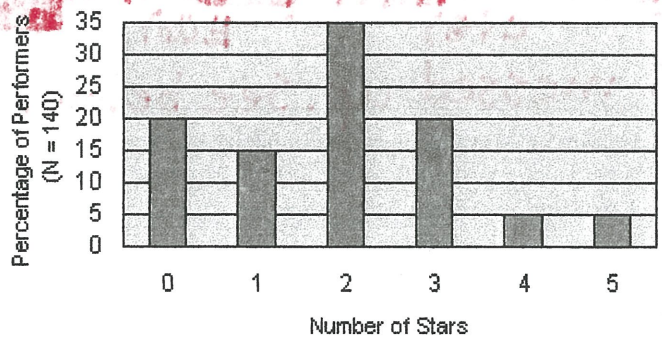
The table below shows the scores of a group of students on a 10 point multiple choice placement test.

Exam Score	Frequency
3	5
4	3
5	5
6	2
7	7
8	6
9	1
10	1

19) The total number of students taking the test is 19) D

A) 8.
B) 180.
C) 52.
D) 30.
E) none of these

The data in the figure below represents the number of stars earned by 140 performers in a talent competition.



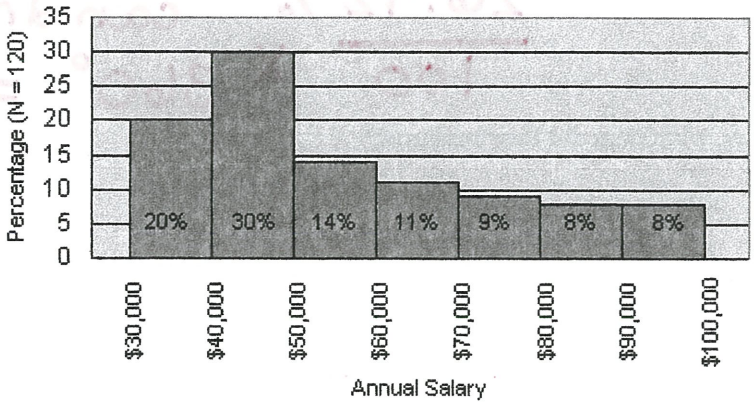
20) How many performers earned 4 stars? 20) B

A) 4
B) 7
C) 10
D) 5
E) none of these

5% of 140

$\frac{5}{100} \times 140 = 7$

The data in the figure below represents the annual salaries of 120 professional mathematicians.



21) The kind of graph shown above is called 21) B

A) a frequency table.
B) a histogram.
C) a bar graph.
D) a box plot.
E) none of these

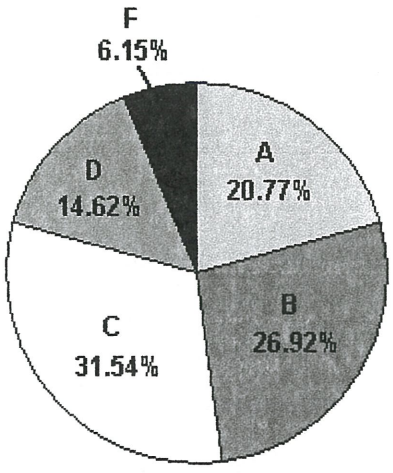
Bar graph - no gaps.

22) Approximately how many mathematicians make $50,000 or more? 22) D

A) 50
B) 40
C) 14
D) 60
E) none of these

14%, 11%, 9%, 8%, 8%
14 + 11 + 9 + 8 + 8 = 50%
50% of 120 = 60

The pie chart shown below represents the grades of 260 students in Professor Blackbeard's Stat 101 class.



23) According to the chart, approximately how many students passed with a grade of 'C' or better? 23) A

A) 206
B) 32
C) 82
D) 79
E) none of these

31.54%
26.92%
20.77%
79.23%

79.23% of 260

$\frac{79.23}{100} \times 260$

= 205.998

24) A good estimate for the number of degrees in the 'B' slice of the pie is 24) C

A) 104°.
B) 27°.
C) 97°.
D) 13°.
E) none of these

when you divide by 100, you can drop the %

$\frac{26.92\%}{100} \times 360^\circ = 96.912$

25) In class last Thursday, what item did I try to return?

A) A notebook
B) A sweater
C) A ring
D) A graphing calculator

C