You must use a <u>pencil</u> to fill in your scantron!!

Make sure that your scantron matches the color of this page. **Read <u>ALL</u> directions carefully before beginning the exam.**

- *Anyone found using a graphing/programmable calculator or cell phone during the final exam will receive a grade of "0".*
- *You may write on this exam. You may not use other paper unless you raise your hand and it is provided by an instructor.*
- *If you finish after 45 minutes, you can take this test with you. If you finish prior to 45 minutes, you will need to turn this test in along with your scantron.*
- *Please turn in your scantron to <u>YOUR</u> teaching assistant and have a picture ID ready.*
- On your scantron, encode your name as specified on the scantron, encode your Dawgtag as your "Identification Number," and encode your ***Section #*** "OP" under the area labeled "Special Codes."

SAMPLE SCANTRON

PLEASE FIND YOUR SECTION NUMBER BELOW:

Section	Lab Days	Time	Instructor
002	W/F	9:00-9:50	Parks
003	T/R	10:00-10:50	Wyne (Pfister)
004	W/F	10:00-10:50	Parks
005	W/F	12:00-12:50	Rupassara
011	T/R	2:00-2:50	Wyne (Pfister)
012	W/F	2:00-2:50	Rathnayake
020	MWF	10:00-10:50	Jie Shi Liew

The last page of the exam is the formula sheet.

- **You may tear that page out**

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1. You spend $39.73 for a meal. Round the cost of the meal to the nearest dollar amount and estimate the cost of a 15% tip.

    a. $6   b. $10   c. $4   d. $8   e. None of these

2. A couch sells for $940. Instead of paying the total amount at the time of purchase, the same couch can be bought by paying $400 down and $70 a month for 12 months. How much is saved by paying the total amount at the time of purchase?

    a. $100   b. $30   c. $300   d. $1070   e. None of these

3. A(n) _____ path must contain every edge in the graph exactly once.

    a. Hamilton   b. Euler   c. Connected   d. Brute Force   e. None of these

4. A single standard die is rolled twice. Find the probability of getting a 6 the first time and a 2 the second time.

    a. 1/12   b. 1/6   c. 1/3   d. 1/36   e. None of these

5. Use the 2012 FICA tax rates in the table below to solve the problem.

TABLE 8.2 2012 FICA Tax Rates		
Employee's Rates	Matching Rates Paid by the Employer	Self-Employed Rates
• 5.65% on first $110,000 of income • 1.45% of income in excess of $110,000	• 7.65% on first $110,000 paid in wages • 1.45% of wages paid in excess of $110,000	• 13.3% on first $110,000 of net profits • 2.9% of net profits in excess of $110,000

   If you are NOT self-employed and earn $188,000, what are your FICA taxes?

    (A) $10,622   (B) $7,346   (C) $16,892   (D) $6,002   (E) None of these

6. A restaurant offers a choice of 4 salads, 9 main courses, and 2 desserts. How many possible 3-course meals are there?

    a. 36   b. 72   c. 144   d. 15   e. None of these

7. Suppose that you borrow $20,000 for four years at 7% toward the purchase of a car. Find the monthly payment. Round to the nearest dollar.

    a. $1249   b. $679   c. $562   d. $479   e. None of these

Use the weighted graph to answer the next 3 questions.

8. Find the total weight of the circuit:

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

   a. 82   b. 78

   c. 174   d. 85

   e. None of these
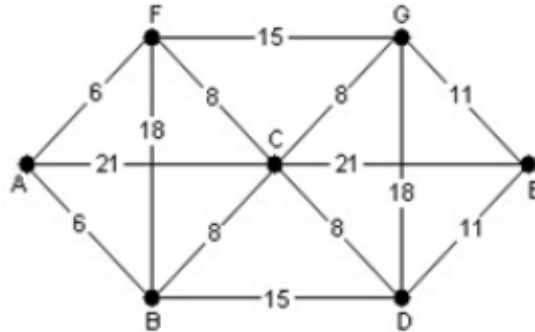
9. Which of the following statements is true?
   a. The graph is a connected graph.
   b. The graph is a tree.
   c. The graph has an Euler circuit.
   d. All of these
   e. None of these

10. What is the total cost of the minimum spanning tree?
   a. 36   b. 44   c. 47   d. 58   e. None of these

11. What is the value of the annuity? Periodic Deposit: $900 at the end of every six months
Rate: 5.5% compounded semiannually   Time: 8 years
Round to the nearest dollar.

   a. $23,804   b. $50,515   c. $16,436   d. $17,788   e. None of these

12. You would like to have $30,000 in 5 years for the down payment on a new house by making deposits at the end of every three months in an annuity that pays 4.25% compounded quarterly. How much should you deposit at the end of every three months? Round UP to the nearest dollar.

   a. $1498   b. $1355   c. $1007   d. $1613   e. None of these

13. A game is played using 1 die. If the die is rolled and shows a 2, the player wins $8. If the die shows any number other than 2, the player wins nothing. If there is a charge of $1 to play the game, what is the game's expected value?
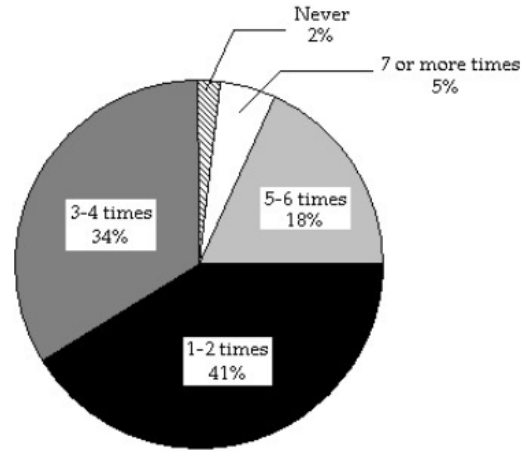
   a. $7.00   b. – $0.33   c. $ 0.33   d. $1.00   e. None of these

14. Use the table of z-scores and percentiles to find the percentage of data items in a normal distribution that lie above a z-score of 0.4.

   a. 65.54%   b. 34.46%   c. -34.46%   d. 0.6%   e. None of these

15. A dress regularly sells for $128, and is on sale for $88. Find the percent decrease of the sale price from the regular price. Round to the nearest tenth of a percent.
    a. 220.0%   b. 45.5%   c. 31.3%   d. 68.8%   e. None of these

16. The circle graph shows the number of times a group of 40,000 survey respondents watched the news in the past week. How many people stated they watched the news 5-6 times in the past week?
    a. 7,200
    b. 11,000
    c. 5,000
    d. 13,000
    e. None of these

Never 2%
7 or more times 5%
3-4 times 34%
5-6 times 18%
1-2 times 41%

17. Find the standard deviation.

    4, 4, 4, 7, 10, 10, 10

    a. 3
    b. 2.85
    c. 8.14
    d. 9
    e. None of these

Use the preference table to answer the next 3 questions.

18. If the Borda Count method is used, how many points would candidate B get?
    a. 168
    b. 186
    c. 242
    d. 188
    e. None of these

Number of Votes	19	16	14	9
First Choice	A	C	D	C
Second Choice	B	A	A	B
Third Choice	D	B	C	A
Forth Choice	E	D	B	E
Fifth Choice	C	E	E	D

19. Which candidate is the winner using the pluarlity method?
    a. A   b. B   c. C   d. D   e. E

20. Which candidate is the winner using the pluarlity with elimination method?
    a. A   b. B   c. C   d. D   e. E

21. The scores on a driver's test are normally ditributed with a mean of 100 and a standard deviation of 26. What percentage of drivers score less than 74 on the test?

    a. 68%   b. 32%   c. 16%   d. 34%   e. None of these

22. Suppose a mother invests $9000 in a bank account at the time of her daughter's birth. The interest is compounded quarterly at a rate of 7%. What will be the value of the daughter's account on her twentieth birthday, assuming no other deposits or withdrawals are made during this period?

    a. $36,057.53   b. $2524.03   c. $10,096.10   d. $50,400.00   e. None of these

You are dealt 1 card from a standard 52-card deck.

23. Find the probability of being dealt an ace or a 9.

    a. 2/13   b. 13/2   c. 5/13   d. 6/13   e. None of these

24. Find the probability that you are not dealt a diamond.

    a. 3/4   b. 4/13   c. 1/4   d. 2/5   e. None of these

25. Find the odds against getting a red queen.

    a. 26 : 25   b. 25 : 26   c. 25 : 1   d. 1 : 25   e. None of these

26. Find the probability the card is a king given that the card is a face card.
    a. 1/12   b. 1/2   c. 1/3   d. 3/10   e. None of these

27. Suppose your credit card has a balance of $2500. You decide to pay off the balance over three years, by making monthly payments of $92. If there are no further purchases charged to the card, how much total interest will you pay?

    a. $668   b. $812   c. $124   d. $1916   e. None of these

28. You borrow $2000 from the bank at 7% simple interest for 1 year. Find the <u>simple interest owed</u> for the use of the money.

    a. $140   b. $70   c. $1400   d. $2140   e. None of these

29. A fair coin is tossed two times in succession. The set of equally likely outcomes is {HH, HT, TH, TT}. Find the probability of getting two heads.

    a. 1/2   b. 1/4   c. 3/4   d. 1   e. None of these

The graph models the football schedule for 5 area high schools. The vertices represent the teams and each game played is represented as an edge between two teams.
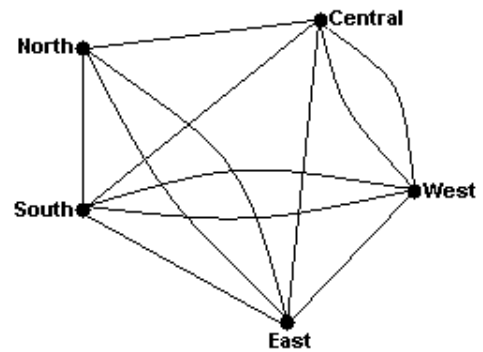
30. How many games are scheduled for East?
    a. 5
    b. 4
    c. 6
    d. 7
    e. None of these

31. Which team does East play twice?
    a. North   b. South   c. Central   d. West   e. None of these

32. The price of a home is $250,000. The bank requires a 15% down payment. Find the amount of the down payment.

    a. $250,000   b. $37,500   c. $287,500   d. $212,500   e. None of these

33. The price of a home is $330,000. The bank requires a 5% down payment. After the down payment, the balance is financed with a 20-year fixed rate mortgage at 8%. Determine the monthly mortgage payment (excluding escrowed taxes and insurance) to the nearest dollar.

    a. $2622   b. $2637   c. $2610   d. $2722   e. None of these

34. Which of the following graphs would have a correlation coefficient (r), which is close to -1?

    a.   b.   c.   d.
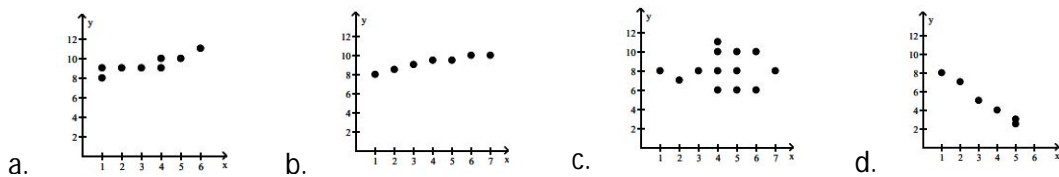
35. In a normal distribution, approximately what percent of data items fall within 2 standard deviations of the mean (in both directions)?

    a. 65%   b. 68%   c. 95%   d. 99.7%   e. None of these

36. 0.1 is of 5% of what number?

    a. 0.2   b. 20   c. 2   d. 0.02   e. None of these

37. 1000 people were surveyed (500 men and 500 women), and asked which of the 3 sports they preferred to watch on TV. The results are shown in the two-way table below.

	Football	Basketball	Baseball	Total
Males	200	175		500
Females		150	90	500
Total	460			1000

How many males said they preferred to watch baseball?

a. 200   b. 175   c. 125   d. 90   e. None of these

38. Which of the following is the circuit obtained by using the Nearest Neighbor Method, starting with vertex A?
     a. A, D, B, C, A
     b. A, D, C, B, A
     c. A, C, B, D, A
     d. A, B, C, D, A
     e. None of these
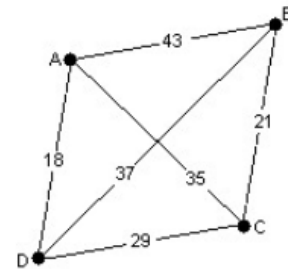
Six people from different occupations were interviewed for a survey, and their annual salaries were:

$12,000, $20,000, $25,000, $37,000, $67,500, $125,000

39. What is the mean annual salary?
     a. $47,750   b. $37,000   c. $31,000   d. $25,000   e. None of these

40. What is the median annual salary?
     a. $47,750   b. $37,000   c. $31,000   d. $25,000   e. None of these

The last page of this exam is the formula sheet and z-score table. You may tear that page out of the exam for your reference.

You must use a pencil to fill in your scantron!

Final Exam Formula Sheet. FEEL FREE TO TEAR OFF THIS LAST DOUBLE SIDED PAGE

Standard Scores and Percentiles

| z-score	Percentile	z-score	Percentile	z-score	Percentile	z-score	Percentile
−3.5	0.02	−1.0	15.87	0.0	50.00	1.1	86.43
−3.0	0.13	−0.95	17.11	0.05	51.99	1.2	88.49
−2.9	0.19	−0.90	18.41	0.10	53.98	1.3	90.32
−2.8	0.26	−0.85	19.77	0.15	55.96	1.4	91.92
−2.7	0.35	−0.80	21.19	0.20	57.93	1.5	93.32
−2.6	0.47	−0.75	22.66	0.25	59.87	1.6	94.52
−2.5	0.62	−0.70	24.20	0.30	61.79	1.7	95.54
−2.4	0.82	−0.65	25.78	0.35	63.68	1.8	96.41
−2.3	1.07	−0.60	27.43	0.40	65.54	1.9	97.13
−2.2	1.39	−0.55	29.12	0.45	67.36	2.0	97.72
−2.1	1.79	−0.50	30.85	0.50	69.15	2.1	98.21
−2.0	2.28	−0.45	32.64	0.55	70.88	2.2	98.61
−1.9	2.87	−0.40	34.46	0.60	72.57	2.3	98.93
−1.8	3.59	−0.35	36.32	0.65	74.22	2.4	99.18
−1.7	4.46	−0.30	38.21	0.70	75.80	2.5	99.38
−1.6	5.48	−0.25	40.13	0.75	77.34	2.6	99.53
−1.5	6.68	−0.20	42.07	0.80	78.81	2.7	99.65
−1.4	8.08	−0.15	44.04	0.85	80.23	2.8	99.74
−1.3	9.68	−0.10	46.02	0.90	81.59	2.9	99.81
−1.2	11.51	−0.05	48.01	0.95	82.89	3.0	99.87
−1.1	13.57	0.0	50.00	1.0	84.13	3.5	99.98

TABLE 12.19 Values for Determining Correlations in a Population

n	$\alpha = 0.05$	$\alpha = 0.01$
4	0.950	0.990
5	0.878	0.959
6	0.811	0.917
7	0.754	0.875
8	0.707	0.834
9	0.666	0.798
10	0.632	0.765
11	0.602	0.735
12	0.576	0.708
13	0.553	0.684
14	0.532	0.661
15	0.514	0.641
16	0.497	0.623
17	0.482	0.606
18	0.468	0.590
19	0.456	0.575
20	0.444	0.561
22	0.423	0.537
27	0.381	0.487
32	0.349	0.449
37	0.325	0.418
42	0.304	0.393
47	0.288	0.372
52	0.273	0.354
62	0.250	0.325
72	0.232	0.302
82	0.217	0.283
92	0.205	0.267
102	0.195	0.254

Example set of 52 poker playing cards

Suit	Ace	2	3	4	5	6	7	8	9	10	Jack	Queen	King
Clubs	♣												
Diamonds	♦												
Hearts	♥												
Spades	♠												

P = the principal amount invested or borrowed (present value)

A = accumulated amount (future value)   r = the interest rate (as a decimal)

t = time (in years)   n = number of compound periods per year

PMT = loan payment

1) Simple Interest:

$$Interest = Prt$$

2) Future Value (with Simple Interest):

$$A = P(1 + rt) \ \text{ or } \ P = \frac{A}{(1+rt)}$$

3) Compound Interest -finite # of compound periods:

(Loan or Investment)

$$A = P\left(1 + \frac{r}{n}\right)^{nt} \ \text{ or } \ P = \frac{A}{\left(1+\frac{r}{n}\right)^{nt}}$$

4) Compound Interest –continous

$$A = Pe^{rt}$$

e is approximately 2.71828 (but use e-button on calculator)

5) Savings Formula (Annuities)

P = deposit made at the end of each time period

$$A = \frac{P\left[\left(1 + \frac{r}{n}\right)^{nt} - 1\right]}{\left(\frac{r}{n}\right)}$$

6) Savings formula (Annuities)

$$P = \frac{A\left(\frac{r}{n}\right)}{\left[\left(1+\frac{r}{n}\right)^{nt} - 1\right]}.$$

7) Loan Formula (Amortization Formula):

$$PMT = \frac{P\left(\frac{r}{n}\right)}{\left[1-\left(1+\frac{r}{n}\right)^{-nt}\right]}.$$