

(071) Math 131: FINITE MATHEMATICS. SECOND MAJOR EXAM
Day: Tuesday, Date: January 08, 2008. Time: 08:00 M.M. to 10:00 P.M.

Dr. Latif and Raja Latif and Muhammad Latif and Abdul Latif

Contents

Marks: 100; Time: 120 Minutes

NAME:.....

I.D.#:

--	--	--	--	--	--

SERIAL# SECTION #: (check one).Sec.:01

		8	<i>A</i>	10	<i>P</i>	1	<i>P</i>
		1	<i>M</i>	5	<i>M</i>	7	<i>M</i>

<i>Your</i>	<i>Seat</i>	<i>No.</i>		
-------------	-------------	------------	--	--

NOTE: SHOW ALL NECESSARY STEPS OF THE SOLUTION FOR ALL QUESTIONS INCLUDING THE MULTIPLE QUESTIONS. NO FULL CREDIT WITHOUT COMPLETE SOLUTION.

The questions are not in any order of difficulty at all. All the questions may not carry equal number of marks. Only the nonprogramable calculators are allowed. In case of Multiple Choice Questions after your precise solution Check (✓) or Circle ⊗ only the one right choice. Write the simplified answer of each question at the specified place at the end of each question. You are not allowed to use any Mobile phone or Pager during the examination. Count that you have Twenty-Seven Questions in this Examination.

Qn.	Marks	Qn	Marks
1	5		
2	4		
3	3		
4	3		
5	3		
6	3		
7	2		
8	3		
9	3		
10	2		
11	3		
12	6		
13	3		
14	3		
15	3		
16	2		
17	3		
18	4		
19	4		
20	4		
21	4		
22	5		
23	8		
24	5		
25	3		
26	6		
27	3		
Max	100		

MCQ101. (Marks : 5) . A father wants to be able to provide his newborn baby with a college education that he will need \$ 120000 (Dollars One hundred and twenty thousands) when his child turns to be of 18 years of age.

How much money should the father invest at present now in an account that pays 7 % interest per year compounded daily so that the account is worth enough money of \$ 120000 in 18 years? (1 Year = 365 Days) . (Round up to two decimal places)

MCQ.102. (Marks : 4) . How long will it take \$ 4000 to grow to \$ 9000 if it is invested at 15 % compounded monthly.

Time in Months:=_____.

Present Investment = _____ Dollars.

MCQ.103. (Marks : 3) .At an annual rate of 10 % compounded continuously, the number of years in which a principal TRIPLES (Three Times) is

(A) $2 \left(\frac{\ln(3)}{0.10} \right)^2$

(B) $\frac{3}{\ln(0.10)}$

(C) $\frac{0.10}{\ln(3)}$

(D) $\frac{\ln(0.10)}{3}$

(E) $e^{0.30}$

(J) $3e^{0.30}$

(K) $2\ln(3)$

(L) $\frac{\ln(3)}{0.1}$

(M) $\frac{\ln(3)}{1.10}$

(N) None of the above choices is correct and the correct answer is equal to: =
 _____.

MCQ104LH116TB17. (Marks : 3) .

The table Below describes the smoking habits of a group of asthma sufferers.

	Men	Women	Total	
<i>Non-Smoker</i>	305	313	618	
<i>Light Smoker</i>	65	75	140	
<i>Heavy Smoker</i>	82	71	153	
Total	452	459	911	

If any one of the 911 persons is randomly selected,

(a) Find the probability that the person chosen is a nonsmoker given that it is a woman.

$\Pr(\text{Nonsmoker/Woman}) = \text{_____}$.

(b) Find the probability that the person chosen is a man given that the person is a Heavy Smoker.

$\Pr(\text{Man/HeavySmoker}) = \text{_____}$.

MCQ105. (Marks : 3). How many different FOUR-letter "words" can be formed from the letters of COMPUTER ? (The word may or may not be meaningful and no letter in the word is repeated)

- (A) 840
- (B) 40320
- (C) 720
- (D) 24
- (E) 192
- (J) 360
- (K) 1296
- (L) 7776
- (M) 1680

(N) None of the above choices is correct and the correct answer is equal to: =
-----.

MCQ106. (Marks : 3). How many ways can 2 men, 2 women, and 2 children be selected from 6 men, 4 women, and 3 children?

- (A) 13
- (B) 72
- (C) 2160
- (D) 720
- (E) 576
- (F) 270
- (K) 2880
- (L) 2160
- (M) 4320

(N) None of the above choices is correct and the correct answer is equal to: =
-----.

MCQ107. (Marks : 2) .A jar contains 5 RED, 4 BLACK, 7 PURPLE, and 9 GREEN marbles. If a marble is drawn at random, what is the probability that the marble is RED or BLACK?

- (A) 0.32
- (B) 0.72
- (C) 0.64
- (D) 0.44
- (E) 0.36
- (F) 0.16
- (J) 0.24
- (K) 0.64
- (L) 0.48
- (M) 0.80

(N) None of the above choices is correct and the correct answer is equal to: = _____.

MCQ108. (Marks : 3) . A teacher found that 85 % of the students in the Math class had passed a course in ALGEBRA,

60 % had passed a course in GEOMETRY, and 55 % had passed BOTH courses.

Find the probability that a student selected randomly from the Math class had passed AT LEAST ONE (Minimum One)[Algebra or Geometry or both] of the two courses.

- (A) 0.2805
- (B) 0.487
- (C) 0.300
- (D) 0.900
- (E) 0.950
- (K) 0.98
- (M) 0.35

(N) None of the above choices is correct and the correct answer is equal to: = _____.

MCQ109. (Marks : 3). After a production run, it was found that 20 % of the units produced had a FAULTY WELD and 5 % had BOTH a DEFECTIVE PAINT JOB and a FAULTY WELD.

If a unit is randomly selected from this run and is noticed (known) that it has a FAULTY WELD, what is the probability that it also has a DEFECTIVE PAINT JOB.

- (A) $\frac{1}{20}$
- (B) $\frac{1}{2}$
- (C) $\frac{1}{10}$
- (D) $\frac{1}{50}$
- (E) $\frac{1}{4}$
- (K) $\frac{1}{5}$
- (M) $\frac{4}{5}$

(N) None of the above choices is correct

and the correct answer is equal to: =

_____.

MCQ110. (Marks : 2). A candidate for office believes that $\frac{4}{5}$ [equivalently 80 %] of registered voters in her district will vote for her in the next election.

If TWO registered voters are INDEPENDENTLY selected at random,

what is the probability that BOTH of them will vote for her in the next election?

- (A) $\frac{9}{25}$
- (B) $\frac{4}{5}$
- (C) $\frac{2}{5}$
- (D) $\frac{4}{25}$
- (E) $\frac{1}{2}$
- (K) $\frac{16}{25}$
- (L) $\frac{12}{25}$
- (M) $\frac{24}{25}$

(N) None of the above choices is correct

and the correct answer is equal to: =

_____.

Q111. **335SM8.**(Marks : 3) .

(Lunch Selections) A restaurant offers 3 different salads, 8 different main courses, 10 different desserts, and 4 different drinks.

How many different lunches — each consisting of a salad, a main course, a dessert, and a drink — are possible?

Number of Lunches:_____

Q112(Marks : 6)

336SM21.

(License Plate Possibilities) How many different license plate numbers can be made using 2 letters from the 26 letters of English Alphabet followed by 4 digits (0, 1, 2, 3, 4, 5, 6, 7, 8, 9), if

(a) Letters and digits may be repeated?

Number of License Plates:_____

(b) Letters may be repeated, but digits are not repeated?

Number of License Plates:_____

(c) Neither letters nor digits may be repeated?

Number of License Plates:_____

Q113(*Marks : 3*)

343SM39(*Arranging Letters*) (a) How many different ways are there to arrange 6 letters in the word *SUNDAY*?

Number of Ways:_____

(b) If we insist that the letter *S* come first, how many ways are there?

Number of Ways:_____

(c) If we insist that the letter *S* come first and the letter *Y* be last, how many ways are there?

Number of Ways:_____

Q114 (*Marks : 3*). 330SM14. Suppose that of

1500 first-year students at a certain college, 350 are taking history, 300 are taking mathematics, and 270 are taking both history and mathematics.

How many first-year students are taking either history or mathematics or both subjects of history and mathematics?

Number of students (taking history or mathematics):_____

Q115 (Marks : 3) 349S6.5M28

(Forming a Committee) The student relations committee of a college consists of 2 administrators, 3 faculty members, and 5 students.

Four administrators, 8 faculty members, and 20 students are eligible to serve.

How many different committees are possible?

Number of committees: _____

Q116 (Marks : 2) 434B6.5Z37. A box con-

tains 5 red, 3 white, and 4 green balls,

Two balls are drawn out of the box in succession(one by one) without replacement.

What is the probability that both balls are of the same red color?

Probability: _____

Q117(Marks : 3)385SM19.

(Likelihood of passing) Jenny is taking courses in both mathematics and English. She estimates her probability of passing mathematics at 0.468 and English at 0.684, and she estimates her probability of passing at least one of them at 0.846. What is her probability of passing both courses?

Q118(Marks : 4)

392SM19.

(Rearranging Letters) If the five letters in the word *VOWEL* are arranged,

(a) What is the probability the word will begin with *L*?

Probability: _____

(b) What is the probability the word will begin with *V* and will end with *L*?

Probability: _____

Probability of passing both courses: _____

Q119(*Marks* : 4) 400S7.4M29. For a 3-child family,

(a) Find the probability of exactly 2 girls, given that the first child is a girl.

Probability: _____

(b) Find the probability of at least (*minimum*) 2 girls, given that the first child is a girl.

Probability: _____

Q120(*Marks* : 2 + 2) .

411S7.5M35. *Recovery Rate* The recovery rate from a flu is 0.85.

If 3 people have this flu, what is the probability that

(a) All will recover?

$\Pr(\text{All will recover}) =$ _____

(b) At least (*minimum*) two will recover.

$\Pr(\text{At least 2 will recover}) :=$ _____

Q121(Marks : 2 + 2)361SM69

(*Forming Committees*) There are 7 boys and 6 girls willing to serve on a committee.

How many 7 – member committees are possible if a committee is to contain:

(a) 3 boys and 4 girls?

Number of Committees:_____

(b) Exactly one girl must be on the committee of seven members?

Number of Committees:_____

Q.122.(Marks : 5) .Read each of the following

statements very carefully. Then if the statement always holds TRUE, then mark TRUE otherwise mark FALSE.

(A)

TRUE	OR	FALSE
------	----	-------

 If two events in a sample space have no outcomes in common, they are said to be independent.

(B)

TRUE	OR	FALSE
------	----	-------

 The effective rate of interest for 10 % compounded daily is about 9.58 %.

(C)

TRUE	OR	FALSE
------	----	-------

 $P(E | F) \neq P(F | E)$ for any two non-empty finite unequal ($E \neq F$) events E and F such that the event E is contained in the event F .

(D)

TRUE	OR	FALSE
------	----	-------

 If $P(E \cup F) = 0.7, P(E) = 0.4,$ and $P(F) = 0.3,$ then then E and F are mutually exclusive (disjoint).

(E)

TRUE	OR	FALSE
------	----	-------

 7. Two non-empty events $A,$ and B are independent if and only if $\Pr(A \cap B) + P(A) + P(B) = \Pr(A \cup B) - \Pr(A) \Pr(B).$

Q123 (Marks : 2 + 2 + 2 + 2) 447T9.5B12.

(College Selection and Family income) A survey of 175 students resulted in the data shown in the following Table . It shows the type of college the student attends and the income level of the student's family.

Suppose a student in the survey is randomly selected.

TABLE College

Income	Private	Public	Total
<i>High</i>	14	11	25
<i>Middle</i>	25	55	80
<i>Low</i>	10	60	70
<i>Total</i>	49	126	175

(a) Find the probability that the student attends a public college, given that the student comes from a middle-income family.

Probability:_____

(b) Find the probability that the student is from a high-income family, given that the student attends a private college.

Probability:_____

(c) If the student comes from a high-income family, find the probability that the student attends a private college.

Probability:_____

(d) Find the probability that the student attends a public college or comes from a low-income family.

Probability:_____

Q124(*Marks : 5*)128ROLFTB114. An investor invests \$1000 at 10% compounded quarterly for 4 years.

At the end of the 4 years, the total amount in the account is reinvested at 8% compounded quarterly for another 5 years.

How much is in the account at the end of 9 years?

Q.125(*Marks : 3*) 416SM40
(*Coins and Dice*) A fair coin is flipped and then a fair die is thrown.

What is the probability of getting heads on the coin and an even number on the die?

Probability:_____

Account Balance:_____ Dollars.

Q.126 (Marks : 2 + 2 + 2) 417SM48

(Broken Calculators) Three broken calculators were inadvertently (randomly) packed in a case of 12 calculators. Two were chosen from the case.

(a) What is the probability both are broken?

Probability: = _____

(b) What is the probability neither of the two is broken?

Probability: = _____

(c) What is the probability at least 1 is broken?

Probability: = _____

Q127LR8750(Marks : 3). An exam consists

of five multiple-choice questions , each with four choices. If a student guesses at every answer, what is the probability that he or she will correctly answer all of the questions?

Probability: = _____.