



Prince Sultan University
Department of Mathematical Sciences

Final Exam

Semester I, 2014 FALL (Term 141)
January 03 , 2014

MATH 101 – Finite Mathematics

Time Allowed : 2 hours

Maximum Points: 80 points

Name of the student:

ID number :

Section :

Instructor : Dr. Kamal Abodayeh

Mr. Khaled Naseralla

Important Instructions:

1. You may use a scientific calculator that does not have programming or graphing capabilities.
2. You may NOT borrow a calculator from anyone.
3. You may NOT use notes or any textbook.
4. There should be NO talking during the examination.
5. Your exam will be taken immediately if your mobile phone is seen or heard
6. Looking around or making an attempt to cheat will result in your exam being cancelled
7. This examination has 16 problems, some with several parts and a total of 6 pages. Make sure your paper has all these problems.

Question	Maximum score	Your Score
Q.1, Q.2, Q.3, Q.4	17	
Q.5, Q.6, Q.7	13	
Q.8, Q.9, Q.10	15	
Q.11, Q.12, Q.13, Q.14	22	
Q.15, Q.16	13	
Total	80	

40

Q.1 (4 points): For a certain commodity the demand equation is given by $D = -4p + 43$. At a price of \$4, there is a supply of 9 units of the commodity. If the supply equation is linear and the **market price** is \$7, find the supply equation.

Q.2 (4 points): A company produces certain items at a cost of \$4 per unit and with a fixed cost of \$40,000. If the selling price for each unit is \$8, what is the number of units that must be sold so the company makes \$50,000 profit?

Q.3 (4 points): At what rate of interest compounded semiannually, will money **triple** in 10 years?

Q.4 (5 points): A fund is being set up so that at the end of 15 years there will be 100,000 SR. If the interest is compounded monthly at a rate of 6.5%. How much money should be paid into the fund every month?

Q.5 (7 points) Use **any appropriate method** to solve the following linear programming problem

Minimize $C = x + 6y$ subject to the constraints:

$$x - y \leq 5$$

$$x + y \geq 8$$

$$x \geq 0, y \geq 0$$

Q.6 (3 points): In how many ways can 8 persons be distributed to three rooms in a hotel where two rooms are with 3 beds each, and the third is with 2 beds?

Q.7 (3 points): In a 20 - question examination, each question is graded right or wrong. The student gets A grade if he answered **at least** 18 questions right. In how many ways can a student get A grade?

Q.8 (3 points): On a basketball team of 16 players, 3 play only center, 5 play only guard, and 8 play only forward. How many different starting lineups are possible if the team consists of 1 center, 2 guards and 2 forwards?

Q.9 (6 points): The following table shows the sales of existing homes in millions of Riyals, in different regions of Saudi Arabia during 2009-2011.

	Riyadh	Makkah	Jeddah	Dammam
2009	1200	1900	900	800
2010	1400	1700	800	700
2011	1500	2100	1200	1100

- a) Find the sales of existing homes in in Makkah
- b) Find the sales of existing homes in 2010 , but not in Riyadh
- c) Find the sales of existing homes in Jeddah after 2009
- d) Find the sales of existing homes in Makkah or Riyadh or in 2010.

Q.10 (6 points): Telephone number consists of a sequence of 7 digits not starting with 0 or 1.(repetition of digits is allowed)

- a) How many possible telephone numbers are possible?
- b) How many telephone numbers are possible if no two adjacent digits are the same? (For example, 235-6789 is permitted but not 233-6789)
- c) What is the probability that the telephone number ends with a digit less than 7.

Q.11 (3 points): Use binomial theorem to expand $(2x - 3y)^4$, (simplify your answer).

Q.12 (3 points): How many different words can be formed using all the letters of the word "MISSISSIPPI"?

Q.13 (6 points): A bag contains three red marbles, three blue ones, three green ones, and two yellow ones. 4 marbles are selected at random.

- How many sets of four marbles are possible?
- How many sets of four marbles are there such that each one is a different color?
- What is the probability that a green marble **was not** selected?
- What is the probability of selecting **at least two** red marbles?

Q.14 (10 points): Given that $P(E) = 0.7$, $P(F) = 0.4$, and $P(E \cup F) = 0.9$

- Draw Venn diagram.
Find the following probabilities:
- $P(E \cap F) =$
- $P(\bar{E} \cap F) =$
- $P(\bar{E} \cap \bar{F}) =$
- Are E and F independent events? Explain.
- Find the odds for E .

Q.15 (5 points): Two cards are drawn at random without replacement from a regular deck of 52 cards. (The deck has 4 different shapes and 2 colors (black and red))

- a) What is the probability that no face (King, Queen or Jack) will appear?
- b) Use tree diagram to find the probability that the first card is heart and the second card is black?

Q.16 (8 points): The following survey was conducted by a perfume producer.

	Like Perfume	Did not like Perfume	No opinion
Group I	180	60	20
Group II	110	85	12
Group III	55	65	7

- a) Find the probability that the person does not like Perfume.
- b) Find the probability that the person likes perfume given that he is from group II.
- c) Find the probability that the person likes perfume given that he is not from group II.
- d) Are the event like Perfume and the event Group III independent? Explain