

ڪرا جي يونيورسي University of Karachi

Department of Health, Physical Education and Sports Sciences HPED 400.1 • Functional Mathematics

<i>Time Allowed</i> : 3 hours • <i>Maximum Marks</i> : 80	• Date: Tuesday, June 17, 2014 • Paper Format: A
Student's Name	(in CAPITAL LETTERS using a "marker")

Each part of Question 1 is of 4 marks. Questions 2-7 are of 10 marks each. Note down the time spent on solving each part of question and time spent on revision by making the following "Time Chart" on the answerbook front page (2 marks). Time spent on revision must be at least 10% of the total time.

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Question No.	1 <i>a</i>	1 <i>b</i>	1 <i>c</i>	1 <i>d</i>	2	3	4	5	6	7	Revision
Time (minutes)											

- a) DO NOT TURN PAPER AROUND unless the invigilator says: Start now
- b) This is a closed-book examination. Deposit all BOOKS, NOTES, MOBILE PHONES (switched off), DIGITAL DIARIES and LAPTOPS in the designated area. Remove everything from your desk, except markers, pens, pencils, stapler and calculator.
- c) If you want to use a calculator, it must bear a "sticker" displaying your NAME and your SEAT NUMBER, large enough so that it is visible from a distance of 5 meters. Absolutely, NO sharing of calculators.
- d) Use your own material. **Nothing can be borrowed from or given to** a friend.
- *e)* The papers may be of different formats. Therefore, work on your own *without consulting anyone* (We have a record of your seating arrangement).
- f) Write your "NAME" on all pages of your question paper (5 marks shall be deducted for failing to comply) [NOTHING ELSE SHOULD BE WRITTEN ON THE QUESTION PAPER] and "PAPER FORMAT" on the front page of your answerbook (the upper-right-hand corner) and the Yellow Sheet using a "marker". Start your work from Page 2 of your answerbook. The only thing that could be written on the front page is the "Time Chart" (see above) and the "Honor Statement" (see below).
- g) The following statement must be copied on the front page of your answerbook and signed (2 marks): "My signatures, below, testify that I am the person, whose name and photograph appear on the Admit Card. Upon my honor, I declare that the following work is my own, completed without giving or receiving unacknowledged help, without copying, or the use of any unfair means." Signatures
- h) This paper contains TWO PAGES (this page and the back page). On invigilator's signal (*Start now*) turn the paper around, check if you have the back page printed, correctly. Last line of the second page reads: **END**>. Start working on the paper, immediately.

- i) Put your pens down and your papers turned (so that this page is facing you) and the FRONT PAGE of your answerbook should be facing you as soon as you hear "ALL PENS DOWN". Failure to do as directed shall result in "deduction of 5 marks" from your score.
- *j)* If you use extra copies, it is "**your responsibility**" to write YOUR NAME, COPY NUMBER and all OTHER INFORMATION on each copy used. All the extra copies must be stapled with the main copy, before turning in your paper (you may wish to bring in a stapler with you for this purpose).
- *k)* If you have a question of "Fill in the blanks" in your paper you must write the complete sentence with the filled word underlined.
- *l)* Nobody is allowed to leave the examination hall, **for whatsoever reason**, once the examination has started. Bring your own DRINKING WATER.
- m) Students are not allowed to LEAVE THEIR SEATS or STAND UP during the examination. If you have a query, "raise your hand" and someone will help you.
- *n)* All work, including rough work, must be on the official answerbook. No extra sheet may be used.
- *o)* Students are *not* allowed to use RED anywhere. All work (except figures) must be in pen or ballpoint.
- p) The result shall be displayed on my homepage on **Tuesday**, **July 1**, **2014** at **0900h**. DO NOT contact the Course Supervisor. Students are not permitted to see the answerbooks.
- q) Anyone found cheating in the examination should be facing disciplinary action, which may result in **EXPLUSION** or **SUSPENSION** for 2 or more years as per University of Karachi rules. **Absolutely, no conversation among students. DON'T TURN THE PAPER, YET.** Wait for "signal" from the invigilator.

Student's Name______ (in CAPITAL LETTERS using a "marker")

- 1-a) At 4^oC density of water is highest. What would be the reading on the Fahrenheit scale? Answer by solving a linear equation.
- 1-b) If order of selection is not important, how many possible ways are there to choose cricket team of 11 from 15 available players (only substitute in the formula to give a numerical result)?
- 1-c) Define solution set of an equation. Write down the solution set of |x-5|=5.
- 1-d) Prove the formula $x^3 a^3 = (x a)(x^2 + ax + a^2)$ by algebraic method.
 - 2) Nadia Elena Comăneci (Romanian gymnast, who scored perfect-10 in 1976 Summer-Olympic competitions in Montréal) was born on November 12, 1961. What is her age today (*i. e.*, June 17, 2014), in *YYYY-MM-DD* form? Convert the computed age into fractional form and compare with the result obtained by first converting 2014-06-17 and her date of birth both in fractional forms. You may use the table given at the end.
 - 3) Divide $x^2 2x 15$ by x 5 employing polynomial-division method.
 - 4) Solve any one of the following linear equations. Also, verify the solution:

$$a) \quad \frac{x}{5} = \frac{x - 32}{9}$$

$$b) \quad 29x + 30(12 - x) = 355$$

- 5) Prove the formula $m_{a+b} = m_a + m_b m$ (m is net mass, defined as mass with zero clothing on, m_a mass with one set of clothing worn, m_b mass with the other set of clothing worn and m_{a+b} mass with both sets of clothing worn), and describe an experiment to prove this result.
- 6) Derive $(x-a)^2 = x^2 2ax + a^2$ by algebraic and geometrical methods and illustrate with one example.
- 7) Solve any one of the following quadratic equations by factorization, completion of square and quadratic formula. Also, verify the solution:

a)
$$x^2 - 2x - 35 = 0$$

b)
$$x^2 + x - 72 = 0$$

Table 1. Cumulative Days in a Year

Months D	N	on-leap Year	Leap Year			
	Days	Cumulative Days	Days	Cumulative Days		
January	31	31	31	31		
February	28	59	29	60		
March	31	90	31	91		
April	30	120	30	121		
May	31	151	31	152		
June	30	181	30	182		
July	31	212	31	213		
August	31	243	31	244		
September	30	273	30	274		
October	31	304	31	305		
November	30	334	30	335		
December	31	365	31	366		

(reproduced from http://www.ngds-ku.org/Papers/J29.pdf, where the same appears as Table 4 on page 94)

Web address of this document: http://www.ngds-ku.org/M609-10/Exams400/4001-14_Paper.pdf (paper shall be uploaded 12 hours after the examination ends)