MA1505 Mid-Term Test

General Information

1. Date: Tuesday, 1 October 2013.

2. Time: From 8:30pm to 9:30pm.

3. Venue: MPSH 1 and MPSH 2. Please check the sitting plans which will be available at a later time in the "Test" folder in the Workbin at the IVLE website to find out your test venue. The sitting plans are arranged according to the students' names in alphabetical order.

4. Format: 10 Multiple choice questions based on Chapters 1, 2, 3, 4 and 5 and covers Tutorials 1 to 4.

5. This is a close book test and **NO** help-sheets are allowed. A formulae list (see the attachment) will be included in the question paper.

6. There is enough blank space and 14 blank pages on the back of each sheet in the question paper for you to do your calculations. We will NOT supply any rough papers and you are **NOT** allowed to bring any rough papers into the test halls.

7. You must bring your matriculation card, 2B pencils, erasers and your calculators to the test. Only non graphing and non-programmable calculators are allowed. Note: Students are not allowed to borrow calculators from each other during the test.

8. All students taking the test should follow strictly the test Hall number and the seat number assigned to them in the sitting plan.

(MPSH 1 and MPSH 2 refers to the multi-purpose sports hall 1 and hall 2 respectively at the Sports Centre.)

9. Anyone taking the test at a wrong venue will risk having the answer sheet misplaced and may end up getting a zero for the CA marks.

During the Test

10. All examination rules must be strictly followed during the test. In particular, **do not start writing before you are told to do so**. **Do not talk to each other during the test**. **Stop writing immediately after the chief invigilator announces that the test has ended**. Anyone caught breaking any examination rules will be referred to the Registrar's Office to face **disciplinary** action.

11. The answer to each question must be shaded properly with 2B pencils (the whole circle corresponding to the answer must be **COMPLETELY** shaded and must be shaded **dark enough** so that the computer can detect it) and if you change your answer later, you must make sure that the old answer is properly erased. Otherwise the computer will mark it wrong and no appeal on this will be entertained.

If you miss the Test

12. Anyone misses the test without a valid MC or a written permission from the module coordinator will get a **zero** for the CA mark.

13. Anyone misses the test with a valid MC or a written permission from the coordinator must take a make-up test *tentatively* scheduled on Saturday, 12 October 2013, 1-2pm at S17-05-12. Please e-mail the coordinator (Fred Leung) at matfredl@nus.edu.sg to inform him of your situation so that he will know the number of students taking the make up test. Please bring along your valid MC or your written permission from the coordinator for admission to take the make-up test on that day.

Note: Students who have taken the main test but are not satisfied with their scores are NOT allowed to take the make up test regardless of having valid MC or not.

14. The make-up test will cover the same material as the mid-term test. The make-up test questions are not multiple choice. The students will need to find the answer to each question and then write the answer in a box following the

question but they do not need to show the details of their solutions.

15. Anyone misses both the mid-term and the make-up tests but have valid excuses for both dates will have to take a second make-up test to be arranged at a later time. The second make-up test will cover the same material as the mid-term test. The questions in the second make-up test are not multiple choice. Students must show complete solutions to support their answers. Full mark to each question will only be given if both the answer and solution are correct.

After the Test

16. Answers to the mid-term test will be posted at the IVLE website on 2 October.

17. Your answer sheets will be graded by a computer. It is **VERY IMPORTANT** that you shade your matriculation number correctly on the answer sheet. If you fail to shade your matriculation number correctly on the answer sheet and you cannot find it from the pile of all answer sheets later, you will get a **ZERO** for your CA.

18. We will post your results on the website after the computer has finished grading and recording the marks. Each student will be able to see his/her mark only.

19. In our experience so far, the computer has not made any mistakes. However, we still had some students making mistakes in shading the answer sheet in the last semester. The common mistakes that we have observed are: (a) shade the matriculation numbers wrongly or enter the NUSNET userid instead of the matriculation number; (b) shade only part of the circle but not the whole circle or the circle is not shaded dark enough; (c) shade two answers for the same question; (d) forget to shade the answer for some of the question; (e) claim to have gotten the correct answer but shaded the wrong circle on the answer sheet. Please be extra careful to avoid these and any other mistakes.

Past test papers

20. Past test papers with answers and solutions from 2006 to 2012 are available at IVLE for your reference. There were some changes to the module syllabus and the topics covered in the mid-term test over the years and the 2012 paper may be used as an approximation to the test paper

this year. In particular the topic on volume of solids of revolution was dropped in 2012 and this topic will also not be covered in the test this year.

Updates

21. Please check the module website frequently for any updates or last minute changes to the information contained here.

Attachments

22. Please find attached to this document the formulae list that will be included with the test for your reference. A sample answer sheet (Form CC1/10) is also attached for your reference.

Formulae List

1. The **Taylor series** of f at a is

$$\sum_{k=0}^{\infty} \frac{f^{(k)}(a)}{k!}(x-a)^k = f(a) + f'(a)(x-a) + \cdots + \frac{f^{(n)}(a)}{n!}(x-a)^n + \cdots$$

2.
$$e^x = \sum_{n=0}^{\infty} \frac{x^n}{n!}$$

3.
$$\sin x = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{(2n+1)!}$$

4.
$$\cos x = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n}}{(2n)!}$$

5.
$$\ln(1+x) = \sum_{n=1}^{\infty} \frac{(-1)^{n-1} x^n}{n}$$

6.
$$\tan^{-1} x = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{2n+1}$$

7. Let $P_n(x)$ be the nth order Taylor polynomial of $f(x)$ at $x = a$. Then

$$f(x) = P_n(x) + R_n(x)$$

where

$$R_n(x) = \frac{f^{(n+1)}(c)}{(n+1)!}(x-a)^{n+1}$$

for some c between a and x.

8. The **projection** of a vector $\mathbf{b}$ onto a vector $\mathbf{a}$, denoted by $\text{proj}_{\mathbf{a}}\mathbf{b}$ is given by

$$\text{proj}_{\mathbf{a}}\mathbf{b} = \frac{(\mathbf{a}\cdot\mathbf{b})}{||\mathbf{a}||^2}\,\mathbf{a}.$$

9. The shortest distance from a point $S\ (x_0,\ y_0,\ z_0)$ to a plane $\Pi\ :\ ax + by + cz = d$, is given by

$$\frac{|ax_0 + by_0 + cz_0 - d|}{\sqrt{a^2+b^2+c^2}}$$

NUS National University of Singapore

Dean's Office, Faculty of Science (ANSWER SHEET)

FORM CC1/10

Write your name here

Use Section B if your matric no. starts with A

Use this part for your answers

SECTION A

Module Code

Date

SECTION B : MATRICULATION NUMBER for Matriculation from 2010 onwards

A

0 0 0 0 0 0 0 A N
1 1 1 1 1 1 1 B O
2 2 2 2 2 2 2 C P
3 3 3 3 3 3 3 D Q
4 4 4 4 4 4 4 E R
5 5 5 5 5 5 5 F S
6 6 6 6 6 6 6 G T
7 7 7 7 7 7 7 H U
8 8 8 8 8 8 8 I V
9 9 9 9 9 9 9 J W
K X
L Y
M Z

DIRECTIONS FOR MARKING ANSWER SHEET

1. Use ONLY a soft lead pencil. DO NOT USE ink or ballpoint pen.
2. Shade circles of your choice completely. Erase cleanly any answer you wish to change.
3. Make no stray marks on this answer sheet.

EXAMPLES OF SHADING

CORRECT ● INCORRECT ⊗ ⊘ ⊖ ⊝

Use section C if your matric no. starts with U or NT or HT

SECTION C : MATRICULATION NUMBER for Matriculation up to 2009

U 0 0 0 0 0 0 A
NT 1 1 1 1 1 1 B
HT 2 2 2 2 2 2 E
3 3 3 3 3 3 H
4 4 4 4 4 4 J
5 5 5 5 5 5 L
6 6 6 6 6 6 M
7 7 7 7 7 7 N
8 8 8 8 8 8 R
9 9 9 9 9 9 U
W
X
Y

S/NO 126501

SECTION D : ANSWERS

1 A B C D E	11 A B C D E	21 A B C D E	31 A B C D E	41 A B C D E
2 A B C D E	12 A B C D E	22 A B C D E	32 A B C D E	42 A B C D E
3 A B C D E	13 A B C D E	23 A B C D E	33 A B C D E	43 A B C D E
4 A B C D E	14 A B C D E	24 A B C D E	34 A B C D E	44 A B C D E
5 A B C D E	15 A B C D E	25 A B C D E	35 A B C D E	45 A B C D E
6 A B C D E	16 A B C D E	26 A B C D E	36 A B C D E	46 A B C D E
7 A B C D E	17 A B C D E	27 A B C D E	37 A B C D E	47 A B C D E
8 A B C D E	18 A B C D E	28 A B C D E	38 A B C D E	48 A B C D E
9 A B C D E	19 A B C D E	29 A B C D E	39 A B C D E	49 A B C D E
10 A B C D E	20 A B C D E	30 A B C D E	40 A B C D E	50 A B C D E
51 A B C D E	61 A B C D E	71 A B C D E	81 A B C D E	91 A B C D E
52 A B C D E	62 A B C D E	72 A B C D E	82 A B C D E	92 A B C D E
53 A B C D E	63 A B C D E	73 A B C D E	83 A B C D E	93 A B C D E
54 A B C D E	64 A B C D E	74 A B C D E	84 A B C D E	94 A B C D E
55 A B C D E	65 A B C D E	75 A B C D E	85 A B C D E	95 A B C D E
56 A B C D E	66 A B C D E	76 A B C D E	86 A B C D E	96 A B C D E
57 A B C D E	67 A B C D E	77 A B C D E	87 A B C D E	97 A B C D E
58 A B C D E	68 A B C D E	78 A B C D E	88 A B C D E	98 A B C D E
59 A B C D E	69 A B C D E	79 A B C D E	89 A B C D E	99 A B C D E
60 A B C D E	70 A B C D E	80 A B C D E	90 A B C D E	100 A B C D E

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