الفقه المالكي وأدلته

Faculty of Science
Mathematics Department
summerTerm Exam
Selected topics in Computer Science (2)
Time: 2 hour
Code: MC 455
August 2017

كلية العلوم- قسم الرياضيات

امتحان الفصل الدراسى الصيفى
المستوي: الرابع
المقرر: موضوعات مختارة في علوم الحاسب (2)
الرمز: 455 رك
الزمن: ساعتان
أغسطس 2017

Answer the following questions: (50 Marks)

I. Choose the correct answer and write it in the answer table: (15 Marks)

1. Every letter in a Java keyword is in lowercase?

(a) true (b) false

2. Which of the following are correct ways to declare variables?

(a) int length; int width; (b) int length, width; (c) int length; width; (d) int length, int width;

3. A block is enclosed inside .....

(a) parentheses (b) braces (c) brackets (d) quotes

4. If a program compiles fine, but it produces incorrect result, then the program suffers a ..... error

(a) syntax (b) runtime (c) logic (d) style

5. Math.pow (4. 1 / 2) returns .....

(a) 0 (b) 1 (c) 2.0 (d)1.0

6. ..... is the Java assignment operator..

(a) == (b) := (c) = (d) +=

7. Let A=1. What are B and A after evaluating the expression int B = A++;?

(a) 1, 2 (b) 2,2 (c) 2,1 (d) 1,1

8. What is the value of (double)(5/2)?

(a) 2 (b) 2.5 (c) 3 (d) 2.0

9. Which of the following is a possible output from invoking Math.random()?

(a) 3.43 (b) 0.5 (c) 1 (d) 1.0

10. Assume x = 4 and y = 5, which of the following is true?

(a) x < 5 && y < 5 (b) x < 5 || y < 5 (c) x > 5 && y > 5 (d) x > 5 || y > 5

11. Suppose x=10 and y=10. What is x after evaluating the expression (y > 10) && (x++ > 10)?

(a) 9 (b) 10 (c) 11 (d) 12

12. What is x after the following statements? int x = 2; int y = 1; x *= y + 1;

(a) x is 1. (b) x is 3. (c) x is 2. (d) x is 4.

13. 25 % 1 is.....

(a) 1 (b) 25 (c) 2 (d) 0

14. What are x , y and z after the following line are executed double x = 1.0; double y = 5.0;

double z = x-- + (++y); ?

(a) 1.0, 6.0, 7.0 (b) 0.0, 6.0, 7.0 (c) 1.0, 5.0, 6.0 (d) 1.0, 5.0, 6.0

15. What is the value of (double) 5/2?

(a) 2 (b) 2.5 (c) 3 (d) 2.0

Answer Table

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer															

II. Write the output of the following blocks of code: (10 Marks)

No	Code	Output

1.	for (int i = 1; i <= 10; i++) {
	System.out.print(i*i + " ");
	i++;
	}	

2.	double[] myList = {1, 5, 1, 5, 5, 1};
	double min = myList[0];
	int indexOfMin = 0;
	for (int i = 1; i < myList.length; i++) {
	if (myList[i] < min) {
	min = myList[i];
	indexOfMin = i;
	}
	}
	System.out.println(indexOfMin);	

3.	public class Test {
	public static void main(String[] args) {
	int i = 1;
	do {
	int num = 1;
	for (int j = 1; j <= i; j++) {
	System.out.print(num + "G");
	num += 2;
	}
	System.out.println();
	i++;
	} while (i <= 5);
	}
	}	

4.	public class Test {
	public static void main(String[] args) {
	int list[] = {1, 2, 3, 4, 5, 6};
	for (int i = 1; i < list.length; i++)
	list[i] = list[i - 1];
	for (int i = 0; i < list.length; i++)
	System.out.print(list[i] + " ");
	}
	}	

5	int i = 1;
	while (i < 10)
	if ((i++) % 2 == 0)
	System.out.println(i);	

6.	for (int i = 1; i < 4; i++) {
	for (int j = 1; j < 4; j++) {
	if (i * j > 2)
	break;
	System.out.println(i * j);
	}
	System.out.println(i);
	}	

7.	int sum = 0;
	sum += 4.5;
	int y = (int)sum;
	sum = (int)(sum + 4.5);
	System.out.println("x is " + sum + " and y is " + y);	

8.	System.out.println("1" + 1 + 1);	

9.	int number=20;
	if (number % 2 == 0)
	System.out.println(number + " is even");
	if (number % 5 == 0)
	System.out.println (number + " is multiple of 5");	

10.	int x, y;
	x = 1;
	y = 2;
	System.out.println("The output is " + x + y);
	System.out.println("The output is " + (x + y));	

III. Underline the error in each block of code below and correct it: **(10 Marks)**

No	Code	Correction
1.	int even; if (even == true) System.out.println("It is even.");	

2.	public class ShowErrors {
	public static void main(String[] args) {
	int i;
	int j = 5;
	if (j > 3) System.out.println(i + 4);
	}
	}	

3.	public class Test {
	public static void main(String[] args) {
	double[100] r;
	for (int i = 0; i < r.length(); i++);
	r(i) = Math.random * 100;
	}
	}	

4.	int i = 0;
	while (i < 10);
	{
	System.out.println("i is " + i);
	i++;
	}	

5.	if (radius >= 0)
	area = radius * radius * PI;
	System.out.println("The area "+ " is " + area);	

IV. Write Java programs for the following : **(15 Marks)**

1. (Find numbers divisible by 5 and 6) Write a program that displays all the numbers from 100 to 1,000, ten per line, that are divisible by 5 and 6. Numbers are separated by exactly one space.

2. (Conversions between Celsius and Fahrenheit) Write a class that contains the following two methods:

/** Convert from Celsius to Fahrenheit */ public static double celsiusToFahrenheit(double celsius)

/** Convert from Fahrenheit to Celsius */ public static double fahrenheitToCelsius(double fahrenheit)

The formula for the conversion is:

fahrenheit = (9.0 / 5) * celsius + 32, celsius = (5.0 / 9) * (fahrenheit – 32)

Faculty Operation Research 426 R Time:3 H Science

Math. Depart Computer Science Section Summer Term 2017

Total degree (50)

1-a) Derive the necessary and the sufficient conditions for the given problem

$Min\ f(\underline{x})$, $\underline{x}\varepsilon R^n$, where $f(\underline{x})$ is a continuous and differentiable function for all needed order (6 points)

-b) Use the derived conditions to evaluate the extreme points of

$$f(\underline{x}) = x_1^3 + x_2^3 + 3x_1^2 - 3x_1^2 - 8$$ (6.5 points)

2-a) Derive the constraint variation method and then the Lagrange multiplier method for the following problem

$$Mini\ f(x_1, x_2)$$

$$Subject\ to\ g(x_1, x_2) = 0$$ (6.5 points)

b) Solve the following problem

$$Min\ f(x_1, x_2) = 5x_1^{-1}x_2^{-2}$$

$$S.t \quad g(x_1, x_2) = x_1^2 + x_2^2 - 9 = 0$$

By i) Constraint variation method

ii) Lagrange multiplier method (6. points)

See Next Page

3-a) Prove that the gradient vector g of the function $f(\underline{x})$ at $\underline{x}^*$ is orthogonal to the tangent plane of the surface $f(\underline{x}) = constant$. (6 points)

-b) Use the steepest decent method (2 iterations only) to solve the problem

$$Min\, f(\underline{x}) = x_1^2 + 2x_2^2 - 4x_1 - 2x_1x_2, \quad \underline{x}^0 = (0.1)$$ (6.5 points)

4-a) If the descent direction of the function

$$f(\underline{x}) = 3x_1^2 + 2x_2^2 + 2x_1x_2 + 7$$

At the point (1, 2) is given by (-1,-1). Compute analytically the step size α to minimize this function in the given direction, and then calculate the next point (6.5 points)

-b) Prove that the gradient vector g of the function $f(\underline{x})$ at $\underline{x}^*$ is orthogonal to the tangent plane of the surface $f(\underline{x}) = constant$

(6 points)

5-a) If $\underline{c}^k$ represents the gradient direction and $\underline{d}^k$ represents the descent direction, for the function $f(\underline{x})$,$\underline{x} \in R^n$, then prove that

$\underline{c}^k \cdot \underline{d}^k < 0$ (6.5 points)

-b) Show that the direction $\underline{d} = (-2, -4, 2)$ at the point $\underline{x}$=$(1, 2, -1)$ of the function $f(\underline{x}) = x_1^2 + x_2^2 + x_3^2$ is a descent direction

(6 points)

Wit my best wishes

Assiut University	**4th Mathematics**	**Time:3 hours**
Faculty of Science	**Complex Analysis 412M.**	**Summer Term 2017**
Math. Dept.	**Instructor: Professor Dr. Mohamed Abd El-Rahman Ahmed**	

Answer only five of the following questions:

1- a) **Mention (with details)** **five properties that are not satisfied in Complex Analysis although these properties are satisfied in Real Analysis. (6 degrees)**

b) **Solve the equations:**

$\ln(z)=\frac{\pi}{2}i.$ $\cos(z)=\cosh(4).$ $e^{z^2+3z}=-i,$ $\sinh(z)=\frac{1}{2}.$ **(4 degrees)**

2- **Show that:**

(I) $\left|e^{z^2}+e^{\bar{z}}\right|\le e^{|z|^2}+\left|e^{\bar{z}}\right|.$ (II) $\left|z_2-z_1\bar{z}_1\right|\ge\left||z_2|-|z_1|^2\right|,$

(III) $\frac{z_1}{z_2 z_3}=\frac{|z_1|}{|z_2||z_3|}e^{i(\arg(z_1)-\arg(z_2)-\arg(z_3))};$ $z_1\neq 0,$ $z_2\neq 0,$ $z_3\neq 0,$ **(10 degrees)**

(IV) $\big||z_1|-|z_2|\big|=|z_1|-|z_2|$ **if and only if** $\theta_1-\theta_2=2n\pi;$ $n=0,\pm1,\pm2,\ldots$,
where $\theta_1=\arg(z_1).$ $\theta_2=\arg(z_2),$

(V) **if** $\lim_{z\to z_0}\frac{f(z)-f(z_0)}{z-z_0}$ **exists, then it is unique and it equals** $f'(z_0).$

3- a)) **Write with proof** **Residue Theorem and Cauchy integral formula. (4degrees)**

b) **Find** **Laurent series of the function** $\frac{5}{(z+2)(z^2+1)},$ $1<|z|<2.$

c) **Verify that** $x\cos(x)\cosh(y)+y\sin(x)\sinh(y)-3e^{-x}\cos(y)$ **is a harmonic function. Also,** **determine** **the corresponding analytic function** f **where the given function is an imaginary component of** f **with** $f(0)=-3$ **. Finally,** **show that** $f(z)-f(-z)+6\cosh(z)=0.$ **(6 degrees)**

4- **Is (with details):**

(i) $|z_1+z_2|\le|z_1|+|z_2|$ $\forall z_1,z_2\in C.$ (ii) $e^{|z|^2}\le\left|e^{z^2}\right|,$

(iii) $Arg\left(\frac{z_1}{z_2}\right)=Arg(z_1)-Arg(z_2)$ $\forall z_1\neq 0,z_2\neq 0,$ (iv) $\overline{\sinh(iz)}=\sinh(-i\bar{z})$ **(10 degrees)**

(v) $f'(z_0)$ **not exist** $\Rightarrow$ **Cauchy-Riemann equations at** z_0 **are satisfied.**

To behind

5- a) **Show that** the functions $f+F,\ f-F,\ f.F,\ \frac{f}{F};\ F(z_0)\neq 0$ have limit at the point z_0 where $f,\ F$ have the same lmit at z_0. (5 degrees)

b) **Using Residue Theorem, find** $\int_{|z|=2} \frac{z^5}{1-z^2}\,dz$ in the positive direction. (5 degrees)

6- a) **Conclude that** the existence of the conliniuty of a complex-valued function f at z_0 leads to the continuity at z_0 of a function $\sqrt{|f|}$ given by

$\sqrt{|f|}(z) := \sqrt{|f(z)|} \qquad \forall z \in C.$ (5 degrees)

b) **Evaluate** $\int_C \frac{z^4}{(z^2+1)^3}dz$ where C is the circle $|z-i|=1$ described counterclockwise. (5 degrees)

Finish

GOOD LUCK

Department of Mathematics		قسم الرياضيات
Faculty of Science	جامعة أسيوط	كلية العلوم

امتحان نهائي الفصل الصيفي ٢٠١٧م

للفرقة: الرابعة　　شعبة: رياضيات　　التاريخ: ٢٠١٧/٨/٢٣

اسم المقرر: هيدروديناميكا ومرونة (١)	رقم المقرر ورمزه: ٤٣١ر	الزمن: ساعتان

أجب عن أربعة فقط مما يأتي:　　(الدرجة الكلية: ٥٠ درجة)

١- أ) إذا كان الجهد المركب لسريان مائع يعطى من $W(z)=\frac{i\Gamma}{2\pi}\ln z$ حيث π ثابت. اوجد معادلات خطوط الانسياب وخطوط تساوي الجهد والسرعة عند أي نقطة وأثبت أن اللف يساوي π وحدد اتجاهه. (6.5 درجة)

ب) اكتب مع البرهان نظرية بلازيوس. (6 درجات)

٢- أ) من معادلات نافيير ستوكس استنتج معادلات الحركة خلال الطبقة الجدارية (الحدية) لمائع لزج غير قابل للانضغاط يتحرك خلال سطح مستوي بفرض أن سرعة الانسياب الرئيسي ثابتة وتساوي U. (6.5 درجة)

ب) إذا كانت دالة الانسياب $\psi=\sqrt{U\upsilon x}\,f(\eta)$ حيث $\eta=y\sqrt{\frac{U}{\upsilon x}}$. بين ما إذا كانت معادلة الاتصال $\frac{\partial u}{\partial x}+\frac{\partial v}{\partial y}=0$ محققة. وأوجد الحل التماثلي لمعادلة الحركة خلال الطبقة الجدارية للمائع في الفقرة (أ). (6 درجات)

٣- أ) أكتب نص نظرية للتحليل البعدي. ثم استخدمها في إيجاد قانون قوة المقاومة τ على وحدة السطوح من جدار أنبوبة على فرض أنها دالة في كل من معامل اللزوجة μ والكثافة ρ والقطر d وسرعة التدفق v. (6.5 درجة)

ب) استنتج مركبات الانفعال بدلالة مركبات الاجهاد. ومن ثم اوجد قانون هوك للانفعال الحجمي. (6 درجات)

٤- أ) استنتج القيمة العظمى لإجهاد القص. (6 درجات)

ب) عنصر حجمي مرن تؤثر على وجوهه الاجهادات الآتية:

$\sigma_x=120, \sigma_y=45, \sigma_z=20,\ \tau_{xy}=30,\ \tau_{xz}=\tau_{zx}=0.$ (بوحدة dN/Cm^2)

احسب: (i) الاجهادات الأساسية. (ii) القيمة العظمى للإجهاد القاص. (6.5 درجة)

٥- استنتج الانفعال الطولي لعنصر مرن طوله الأصلي P_oQ_o ويصنع اتجاهه مع المحاور (x, y, z) جيوب تمام اتجاهه بالمقادير (ℓ, m, n). (6 درجات)

ب) إذا كانت حالة الاجهاد داخل جسم مرن تعطى من:

$\sigma_x=2xy,\ \tau_{xy}=5y^2,\ \tau_{yz}=2z,\ \ \sigma_y=\sigma_z=\tau_{xz}=0$

عين الإجهاد عند النقطة $(2, 1, \sqrt{3})$ التي تقع على المستوى المماس للاسطوانة $y^2+z^2=4$. (6.5 درجة)

حظ موفق ان شاء الله -------- أ.د./ فؤاد سيد إبراهيم & د. حسين حماد