Kingdom of Saudi Arabia
Ministry of Higher Education
Majmaah University
Zulfi, College of Sciences
Mathematics Department

جامعة المجمعة
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المملكة العربية السعودية
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كلية العلوم بالزلفي
قسم الرياضيات

COURSE CLASSIFICATION FORM

Course Number/Name	**Math422 Introduction to partial differential equations**		
Prepared by	**Dr. Mohamed Herzallah**		
Program Learning Outcomes	**Levels* (0,1,2, 3,4,5)**	**Relevant Activities**	**Assessment Methods/Metrics**
a1. Apply fundamentals and concepts of mathematics.	**5**	- Lectures - assignments	• 2 Midterm and final exam • Home work
a2. Apply fundamentals and concepts General sciences and Computer skills.	**3**	- assignments on logic statements	• 1 Midterm and final exam • Home work
a3. Realize Social and ethical values.	**4**	-Lectures - work team from the students	• Home work • The oral discussions
b1. Read and construct mathematical arguments and proofs	**5**	- Lectures - assignments	Home work
b2. Apply critical thinking skills to solve problems that can be modeled mathematically.	**5**	- Lectures - assignments - Oral discussion	• 2 Midterm and final exam+ Home work
c1. Work independently and within a team	**4**	Divided students into groups and using oral discussion with homework	• Home work
c2. Bear responsibility for different situations.	**4**		• Quizzes
c3. Realize codes of ethics and their importance.	**4**		
d1. Communicate a depth and breadth of mathematical knowledge, both orally and in writing.	**5**	- Lectures - assignments - Oral discussion	• 2 Midterm + final exam • Home work • Quizzes
d2. Ability to Organize, connect and communicate mathematical and algorithmic ideas.	**5**	- Lectures - assignments	• Home work • Quizzes
d3. Critically interpret numerical and graphical data.	**4**	- assignments on information data and represented data	• Home work • Quizzes
e1. Use computer and its applications as an office tool	**2**	- assignments on Logical expression	Home work Quizzes

*** Please mark (or type) High (5), Medium-High (4), Medium (3), Low-Medium (2), Low (1) or Not At All (0) indicating the level to which you believe, as an instructor, the students have achieved these outcomes in this course.**

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Course Objectives and Outcomes

Course Number:Math422 **Course Name: Introduction to partial differential equations**
Prepared by: Dr. Mohamed Herzallah

Table 1: Relationship of course objectives/outcomes with PLO and ASIIN Criteria

Course Objectives:	Course Outcomes:	ASIIN	PLO
Have the knowledge of partial differential equation and its solution	**Define** and **recognize** the PDE	a, b, e, m	
	Improve and **outline** the solution of PDE.	b, c	
	Illustrate how to communicating with: Peers, Lecturers and Community.	l, n	
Have the knowledge of First order linear partial differential equation.	**Define** and **recognize** the first linear PDE	a, b, c, g, m , j	
	Shown the ability of working independently and with groups.	n	
	Illustrate how take up responsibility.	l, n	
Using Lagrange's method to find the solution	**Define** and **recognize** the Lagrange's method	a, b, f, h	
	ability to **find the solution using Lagrange's mehtod**	a, j, g	
Have the knowledge of Cauchy problems	**Define** and **recognize** the Cauchy problem	a, c, h	
	Illustrate how to Search the internet and using software programs to deal with problems	d, h	
Have the knowledge of the second order linear PDE in several variables	**Define** and **recognize** the second order linear PDE and its kinds	a, e, i	
	interpret how to Know the kinds of second order linear PDE	k, h, g	
Have the knowledge of physical application with using separation of variables	**Define** and **recognize** the separation of variables method	a, i	
	interpret how to use the separation of variables method to solve the PDE of the physical applications	h, k	
Have the knowledge of classifications of PDE	**Define** and **recognize** the classifications of PDE	a, i	
	interpret how to classify the PDE	k, h, g	
Have the knowledge of integral transforms (Fourier and Laplace	**Define** and **recognize** different kinds of integral transforms	a, i	

transforms) and there applications to PDE	**interpret** how to use the integral transforms in solving PDE	k, h, g	

Table 2: Methods of assessment of course syllabus

.

Assessment Method	Number/Type				Instructor Assessed	TA/Grader Assessed	Peer/Self Assessed
Homework	5 homework assignments				x		
Mid Terms/Final Exams	2 mid-term; 1 final exam				x		
Quizzes	One biweekly				x		
Individual Projects	1-2 wks	3-4 wks	1/2 sem	Full sem			
Team Projects	1-2 wks	3-4 wks X	1/2 sem	Full sem x	x		x
Lab Assignments							
Computer Assignments							
Computer Tools Used							
Oral Presentations	One				x		x
Written Reports	One				x		
Other	Design project (project binder)				x		

Outcome of ASIIN	
a	Graduates have sound mathematical knowledge. They have a profound overview of the contents of fundamental mathematical disciplines and are able to identify their correlations.
b	Graduates are able to recognise mathematics-related problems, assess their solvability and solve them within a specified time frame.
c	Graduates have a basic ability to work in a scientific way. They are in particular able to formulate mathematical hypotheses and have an understanding of how such hypotheses can be verified or falsified using mathematical methods.
d	Graduates can flexibly apply mathematical methods of fundamental component areas of mathematics and are able to transfer the findings obtained to other component areas or applications.
e	Graduates have abstraction ability and are able to recognise analogies and basic patterns
f	Graduates are able to think in a conceptual, analytical and logical manner.
g	Graduates have an extensive comprehension of the significance of mathematical modelling. Are able to create mathematical models for mathematical problems as well as for problems in other areas of science or everyday life, and have a selection of problem solving strategies at their disposal.
h	Graduates can use basic methods of computer-aided simulation, mathematical software and programming to solve mathematical problems
i	Graduates are in a position to solve more extensive mathematical
j	Graduates can classify, recognise, formulate and solve mathematics-related problems
k	Graduates use electronic media competently
l	Graduates can implement lifelong learning strategies. A prerequisite for this is that the students are per-severing and that they have developed persistence.
m	Graduates can recognise, formulate, classify and solve problems in a mathematical context
n	Graduates can communicate, possibly also in a foreign language, and contribute their work effectively in teams

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Instructor Course Evaluation Form

The purpose of this evaluation is to collect instructor feedback for improving this course and the Mathematics program. Information will also be used for program accreditation purposes.

I. Program Learning Outcomes Evaluations

Course Number/Name	Math422 Introduction to partial differential equations	Semester	second 1434/1435
Instructor	Dr. Mohamed Herzallah		

The course listed above is designed for students to achieve the following outcomes at a Not At All, Low, Low- Medium, Medium, Medium-High or High level.

Please mark (or type) High (5), Medium-High (4), Medium (3), Low-Medium (2), Low (1) or Not At All (0) indicating the level to which you believe, as an instructor, the students have achieved these outcomes in this course.

Program Learning Outcomes	Relevant Activities	5	4	3	2	1	0
a1. Apply fundamentals and concepts of mathematics.	- Lectures - assignments	**5**					
a2. Apply fundamentals and concepts General sciences and Computer skills.	- assignments on logic statements			**3**			
a3. Realize Social and ethical values.	-Home work - Oral discussions		**4**				
b1. Read and construct mathematical arguments and proofs.	- Lectures - assignments	**5**					
b2. Apply critical thinking skills to solve problems that can be modeled mathematically.	- Lectures - assignments - Oral discussion	**5**					
c1. Work independently and within a team	Divided students into groups and using oral discussion with homework		**4**				
c2. Bear responsibility for different situations.			**4**				
c3. Realize codes of ethics and their importance.			**4**				
d1. Communicate a depth and breadth of mathematical knowledge, both orally and in writing.	- Lectures - assignments - Oral discussion	**5**					
d2. Ability to Organize, connect and communicate mathematical and algorithmic ideas.	- Lectures - assignments	**5**					
d3. Critically interpret numerical and graphical data.	- assignments on information data and represented data		**4**				

e1. Use computer and its applications as an office tool	- assignments on Logical expression				2		

II. **Catalog Description , and Course Prerequisites Evaluations:**

Based on your experiences in the course, please respond by circling the most appropriate number. Circle N/A for items that are not applicable, or if you have no opinion.

Catalog Description 1434-1435	• **Clssification and Formation of Partial Differential Equation** • **First-order linear P.D.E.** • **Solution using Lagrange's method** • **Cauchy problem** • **Second-order linear P. D. E. in several variables** • **Physical application using separation of variables** • **Classifications of P.D.E.** • **Some boundary value problems** • **Green's function.**						
Course Prerequisites:	Math321	**Circle One (5=Strongly Agree; 1=Strongly disagree)**					
2a. Do you believe that the catalog description (above) is accurate for this course?		**(5)**	**4**	**3**	**2**	**1**	**N/A**
2b. Do you believe that the course prerequisites (above) are appropriate for this course?		**(5)**	**4**	**3**	**2**	**1**	**N/A**
2c. If not, please list any prerequisites you believe are not appropriate for this course.							

III. **Textbook(s) and/or Lab Manuals (if applicable) Evaluations:**

Textbook(s) and/or Lab Manuals (if applicable):	• **Stanley J. Farlow, Partial Differential Equations for Scientists and Engineers, Dover Publication, INC. New York, 1993.** • **Echko, Principles of Partial Differential Equations, Springer, 2009.**	**Circle One (5=Strongly Agree; 1=Strongly Disagree)**				
3a. In general, do you believe this to be an appropriate textbook for this course?		**5**	**(4)**	**3**	**2**	**1**	**N/A**
3b. Was the organization of the textbook appropriate for this course?		**(5)**	**4**	**3**	**2**	**1**	**N/A**
3c. Was the level of the textbook appropriate for this course?		**(5)**	**4**	**3**	**2**	**1**	**N/A**

IV. **Computer usage (if applicable) Evaluations:**

Computer usage (if applicable):	**Circle One (5=Strongly Agree; 1=Strongly Disagree)**					
5a. Was the use of computer well integrated with the course?	**5**	**4**	**3**	**2**	**(1)**	**N/A**
5b. Was the computer lab adequately equipped with well-maintained and updated computers?	**5**	**4**	**3**	**2**	**(1)**	**N/A**
5c. Was the computer lab equipped with sufficient number of computers?	**5**	**5**	**5**	**2**	**(1)**	**(N/A)**
5d. Were the special software packages (MATLAB, SPSS, C+, FORTRAN, etc) available and accessible?	**5**	**4**	**3**	**2**	**(1)**	**(N/A)**
5e. Was adequate technical support available when needed?	**5**	**4**	**3**	**2**	**(1)**	**(N/A)**

Model Answer

Solve the following questions:

1- A) Find the partial differential equation which has the solution

$u = x\,F(y) + y\,G(x)$ where $F(y), G(x)$ are arbitrary functions. 4 marks

B) Use Fourier sine transform to solve the partial differential equation 6 marks

$$u_t = \alpha^2 u_{xx}, \quad 0 < x < \infty, \quad 0 < t < \infty$$
$$u(0,t) = A, \quad 0 < t < \infty$$
$$u(x,0) = 0, \quad 0 < x < \infty$$

2- A) Write the value of the following 4 marks

$i)\ \mathcal{L}(e^{ax}\cos(bx))$ $ii)\ \mathcal{L}\left(f'''(t)\right)$

$iii)\ \mathcal{F}_c\left(f'''(t)\right)$ $iv)\ \mathcal{F}\left(e^{-|x|}\right)$

B) Find D'Alembert solution of the wave equation 6 marks

$$u_{tt} = c^2 u_{xx}, -\infty < x < \infty, \quad 0 \le t < \infty$$
$$u(x,0) = f(x), \quad u_t(x,0) = g(x)$$

and then find the solution when $f(x) = x, \quad g(x) = 1$

3- A) Rewrite the partial differential equation 5 marks

$y\,u_{xx} - x\,u_{yy} = 0, \quad x > 0, \ y > 0$

In its canonical form.

B) Solve the interior Dirichlet problem for the circle 5 marks

$$u_{rr} + \frac{1}{r}u_r + \frac{1}{r^2}u_{\theta\theta} = 0, \quad 0 < r < 1$$
$$u(1,\theta) = g(\theta), \quad 0 \le \theta < 2\pi.$$

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Model Answer

4- Mark (true) or (false) with giving the reason of your answer 10 marks

i) $u_{tt} = uu_{xx} + 2u$ is a nonlinear partial differential equation

ii) $u_t + u_{xx} + u - 2 = 0$ is a homogeneous partial differential equation

iii) $u_{xx} + u_{yy} = 0$ is an elliptic partial differential equation

iv) Laplace transform can be given for any function

v) By $u(x,t) = e^{\beta t} w(x,t)$ we can transform the partial differential equation $u_t = \alpha^2 u_{xx} + \beta u$ to the partial differential equation $w_t = \alpha^2 w_{xx}$.

vi) The convolution is defined by $(f * g)(t) = f(t)g(t)$

vii) The Laplace transform of $cos(2t)$ is given by $\mathcal{L}(cos(2t)) = \frac{1}{s^2+2}$

viii) The canonical form of elliptic equation is $u_{\xi\eta} = \phi(\xi, \eta, u, u_\xi, u_\eta)$

ix) The function $u = F(3x - 4y)$ is the general solution of the partial differential equation $4u_x + 3u_y = 0$ where F is an arbitrary function.

x) The partial differential equation $Au_{xx} + Bu_{xy} + Cu_y = 0$ is called elliptic equation if $B^2 - 4AC < 0$.

1) A) The solution is

$$u = xf(y) + yG(x)$$

$$\Rightarrow F(y) = \frac{1}{x}\left[u - yG(x)\right]$$

Diff. w.r.t. x

$$\Rightarrow 0 = -\frac{1}{x^2}\left[u - yG(x)\right] + \frac{1}{x}\left[u_x - yG'(x)\right]$$

$$= \frac{1}{x}u_x - \frac{1}{x^2}u - y\left[\frac{G(x)}{x^2} + \frac{G'(x)}{x}\right]$$

$$\Rightarrow \frac{G(x)}{x^2} + \frac{G'(x)}{x} = \frac{1}{y}\left[\frac{1}{x}u_x - \frac{1}{x^2}u\right]$$

Diff. w.r.t y

$$\Rightarrow 0 = -\frac{1}{y^2}\left[\frac{1}{x}u_x - \frac{1}{x^2}u\right] + \frac{1}{y}\left[\frac{1}{x}u_{xy} - \frac{1}{x^2}u_y\right]$$

$$\Rightarrow 0 = -xu_x + u + xyu_{xy} - yu_y$$

$$\Rightarrow xyu_{xy} - xu_x - yu_y + u = 0$$

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1 B) Using Fourier sine transform

we have

$$U_t = \alpha^2 U_{xx}, \quad u(0,t) = A, \quad u(x,0) = 0$$

operating by the Fourier sine transform

$$\Rightarrow \text{where } U = \mathcal{F}_s(u)$$

$$\Rightarrow U_t = \alpha^2\left(-w^2 U + \frac{2}{\pi} w\, u(0,t)\right)$$

$$\mathcal{F}_s(u_t) = U_t, \quad \mathcal{F}_s(u_{xx}) = -w^2 U + \frac{2}{\pi} w u(0,t)$$

The PDE takes the form

$$\Rightarrow U_t = -\alpha^2 w^2 U + \frac{2}{\pi} wA, \quad U(0) = 0$$

$$\Rightarrow U_t + \alpha^2 w^2 U = \frac{2\alpha^2}{\pi} wA$$

The integrating factor is

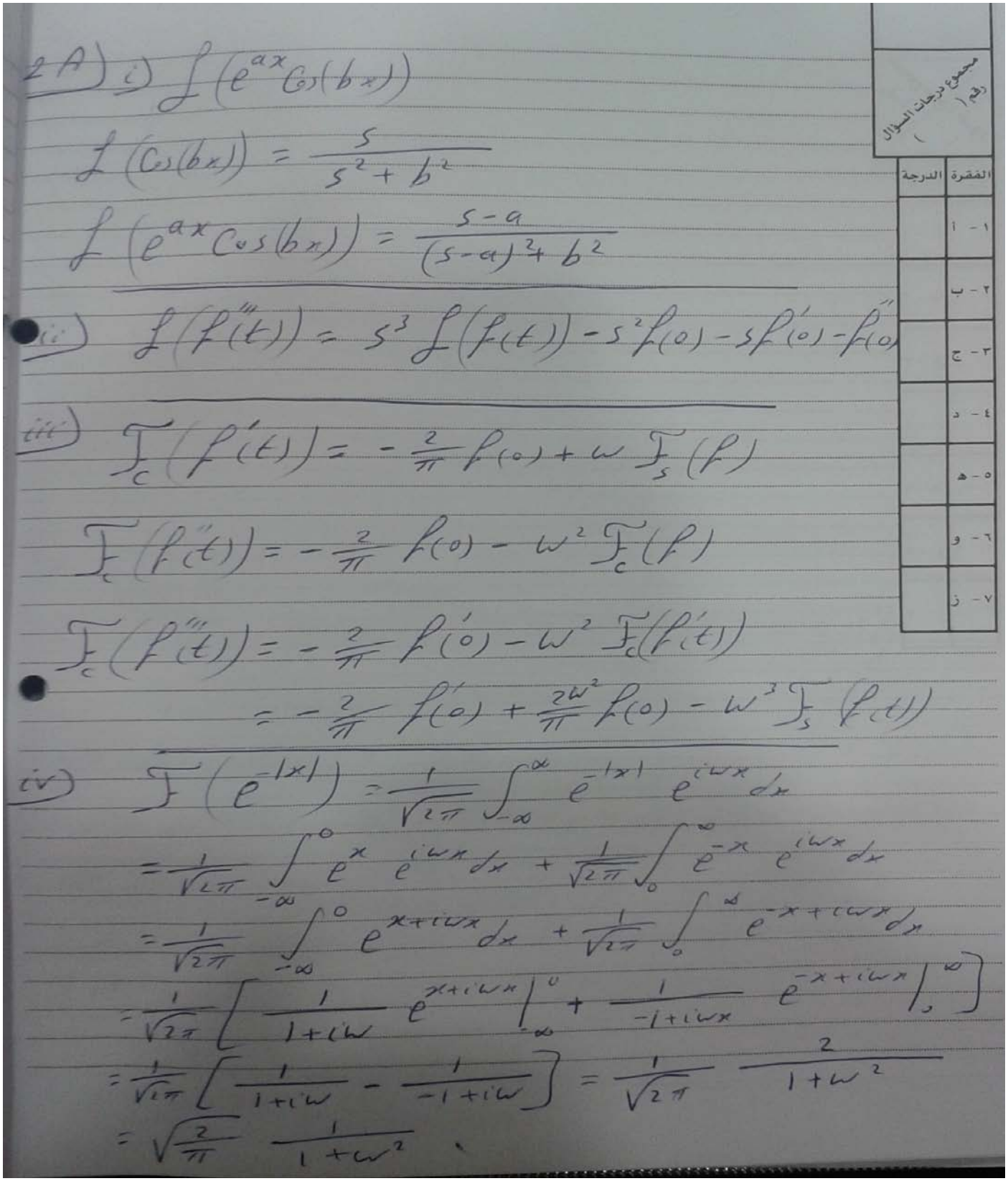
$$\mu(t) = e^{\alpha^2 w^2 t}$$

$$\Rightarrow e^{\alpha^2 w^2 t} U = \frac{2\alpha^2}{\pi} wA \int e^{\alpha^2 w^2 t} dt = \frac{2A}{\pi w} e^{\alpha^2 w^2 t} + C_1$$

$$U(0) = 0 \Rightarrow C_1 = -\frac{2A}{\pi w}$$

$$\Rightarrow U = \frac{2A}{\pi w}\left(1 - e^{-\alpha^2 w^2 t}\right)$$

$$\Rightarrow u(x,t) = \mathcal{F}_s^{-1}(U) = \int_0^\infty \frac{2A}{\pi w}\left(1 - e^{-\alpha^2 w^2 t}\right) \sin(wt)\, dw$$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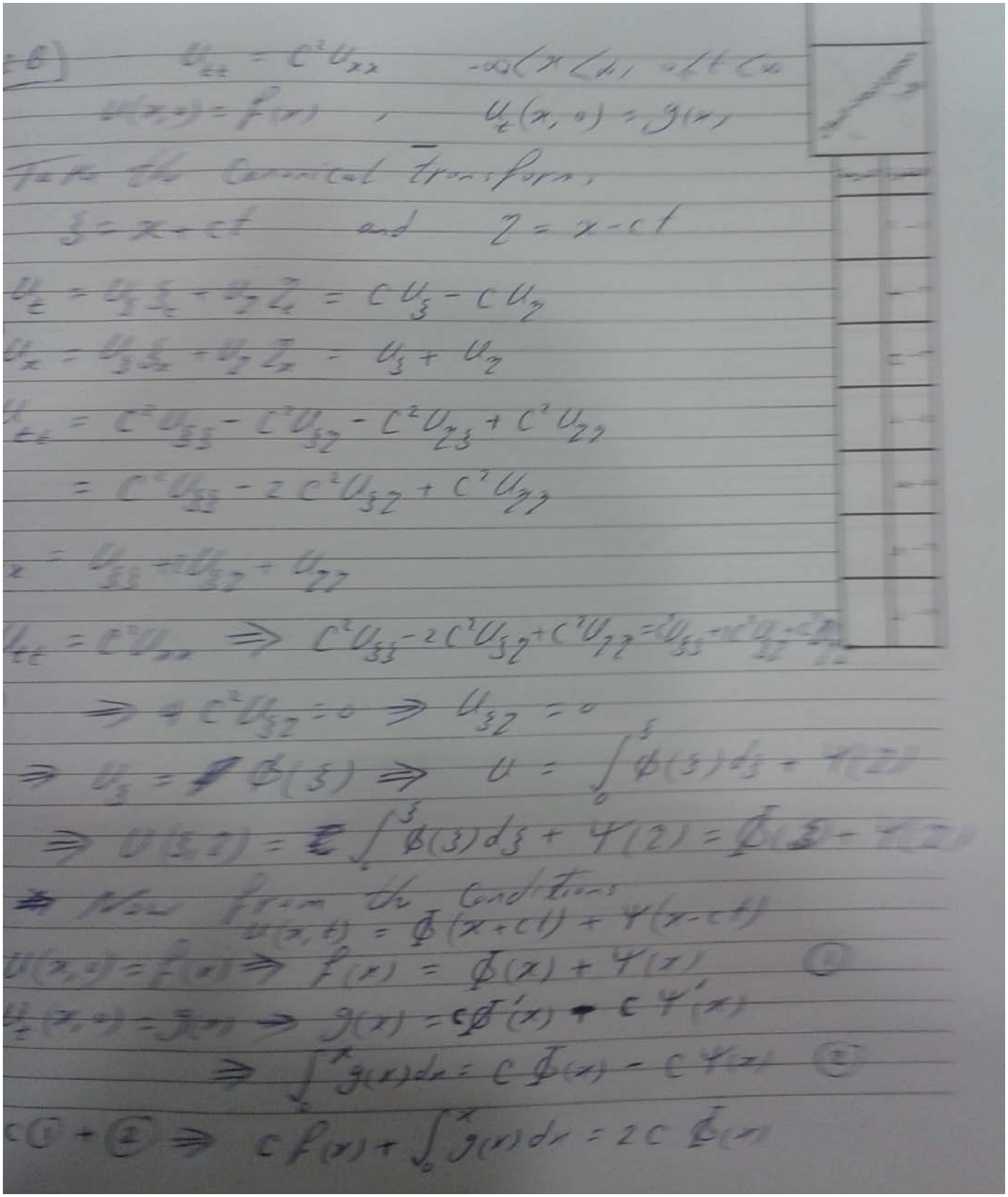
Model Answer



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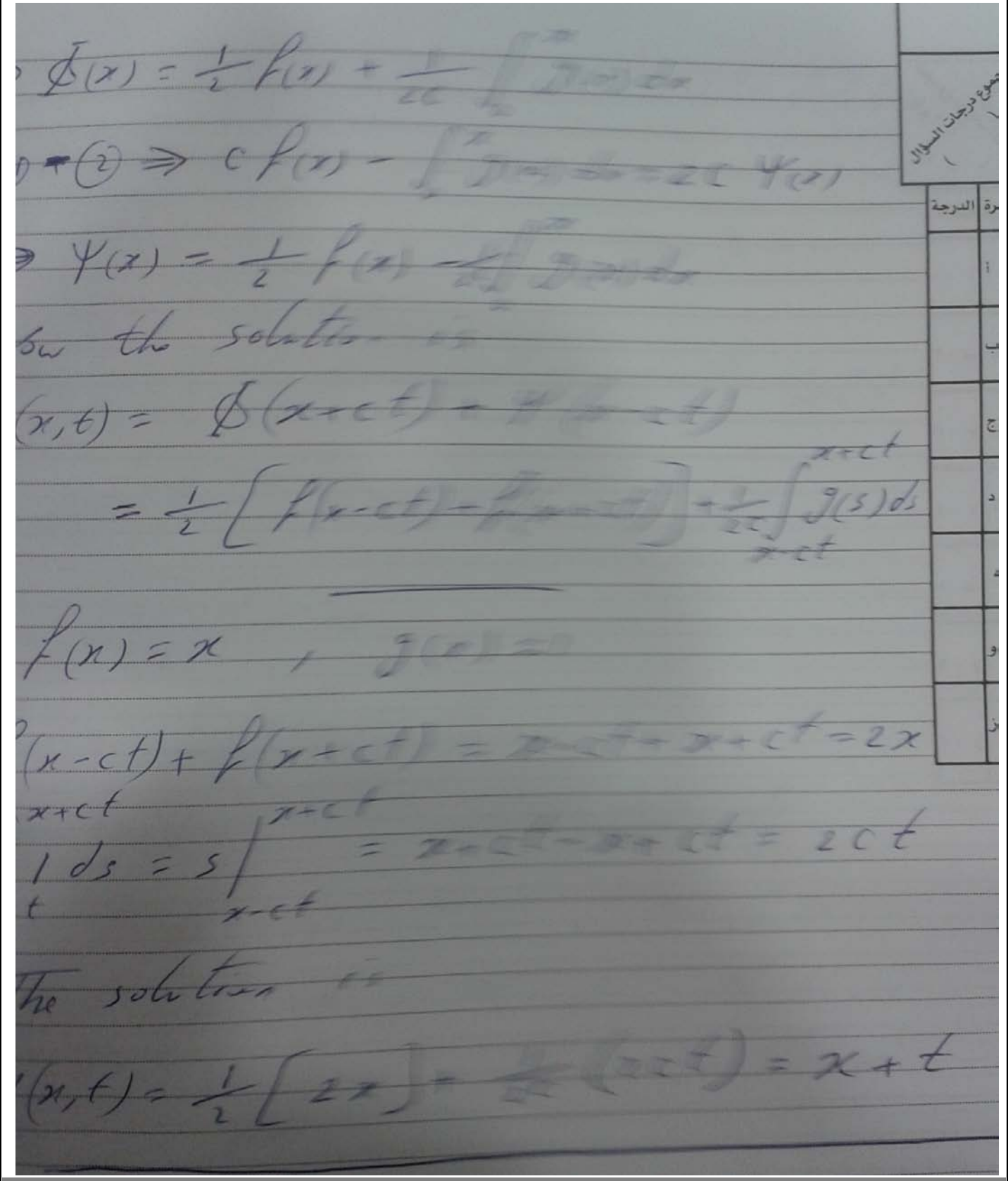

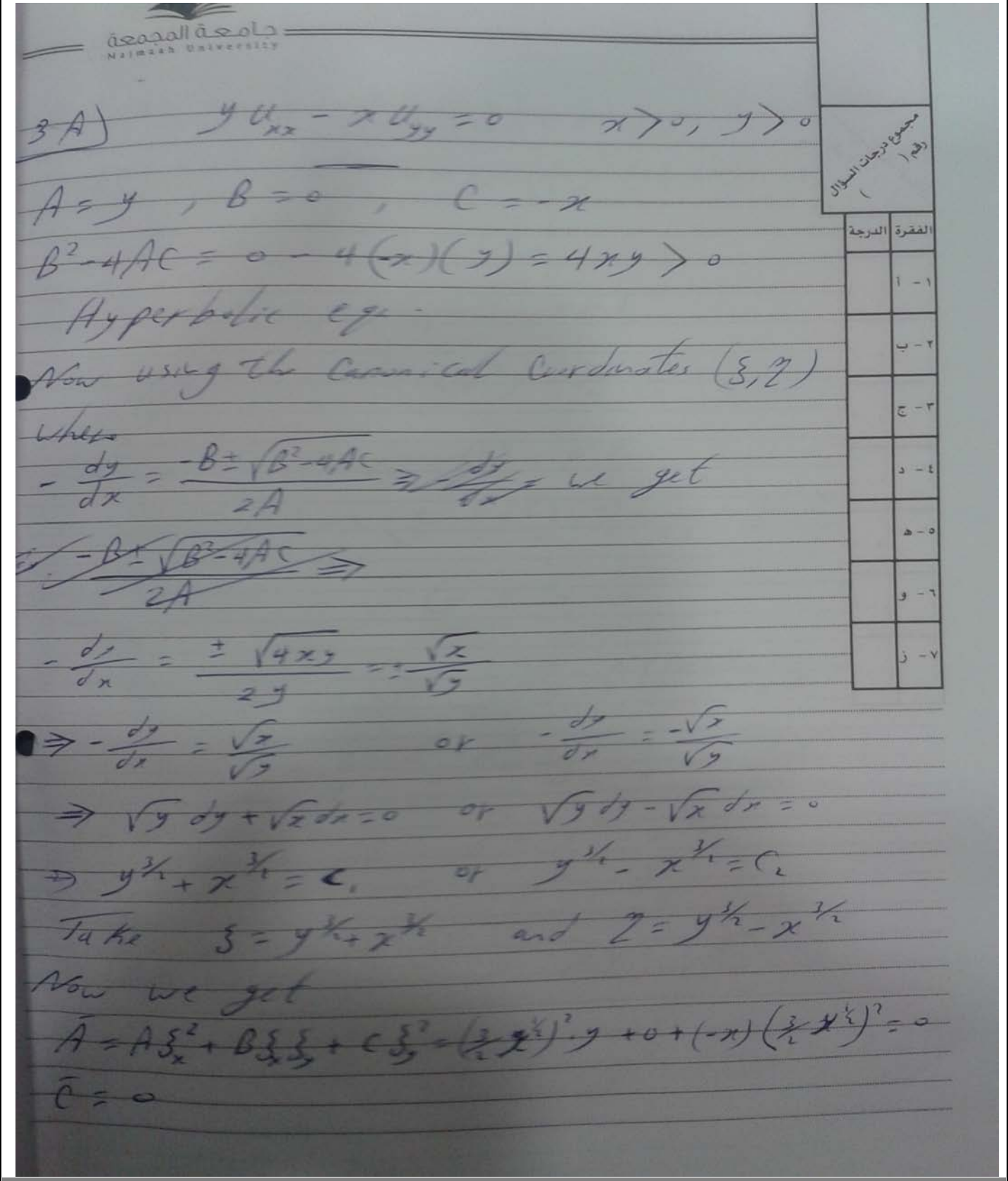
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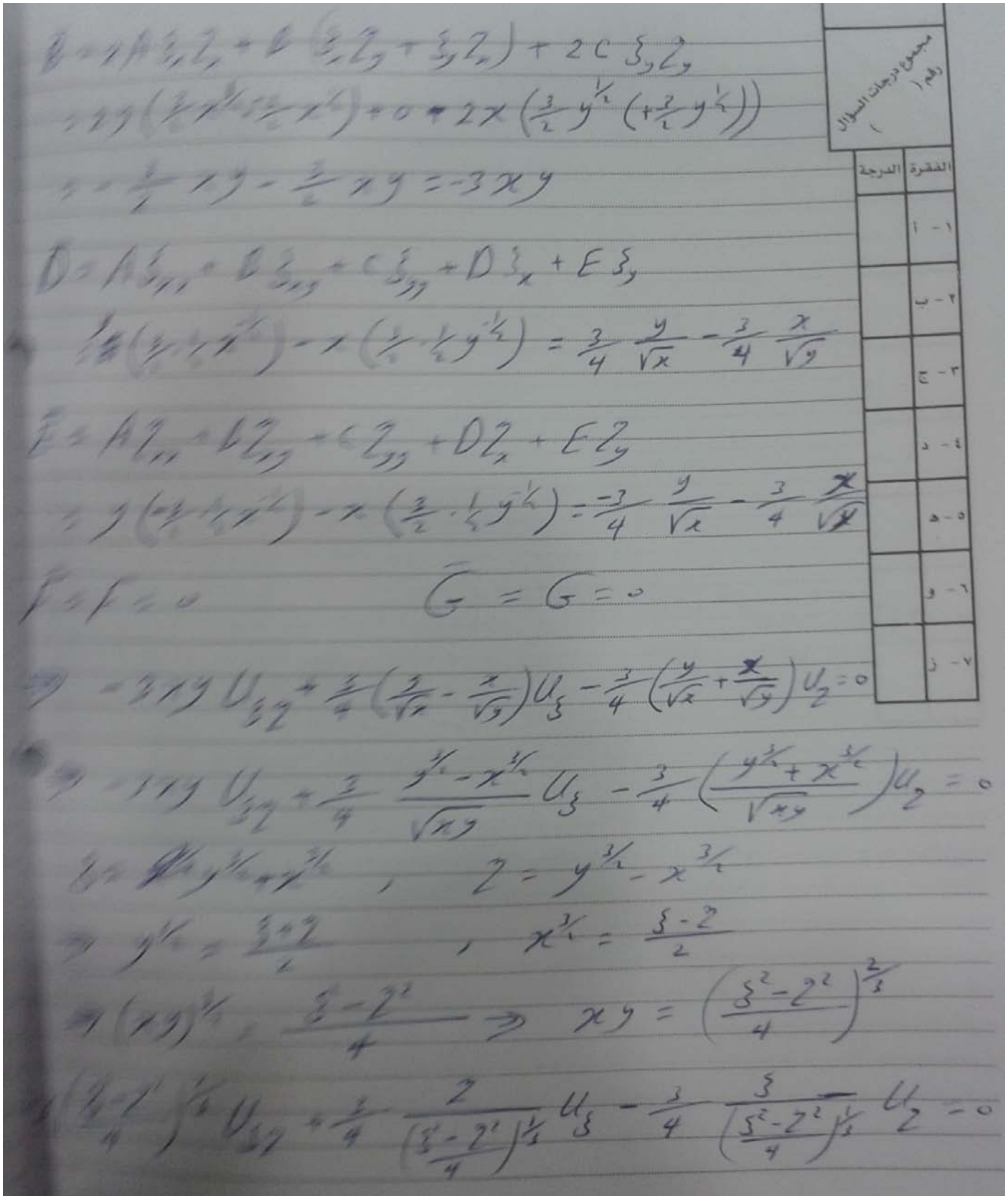

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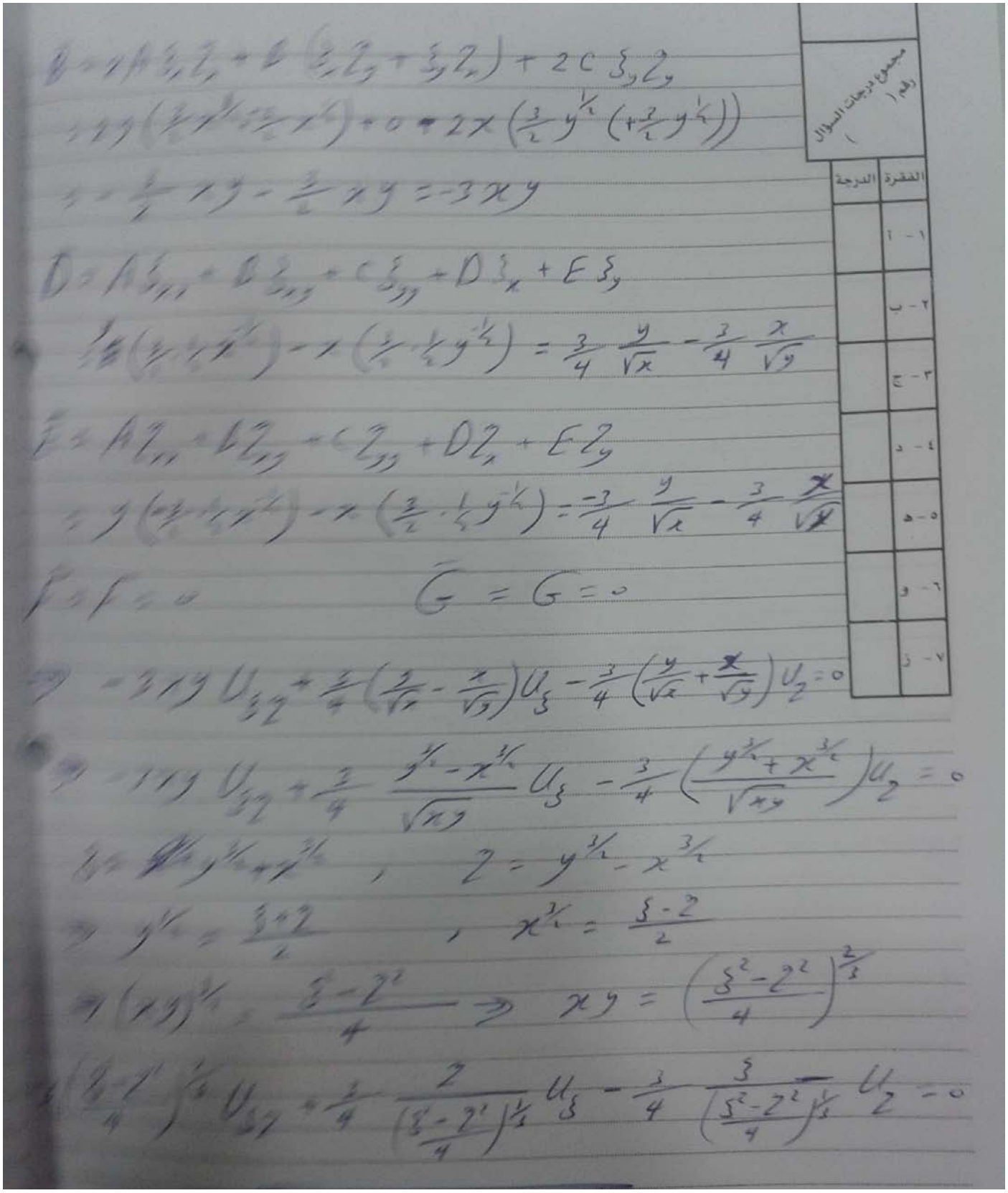

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Model Answer

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3 B) $u_{rr} + \frac{1}{r} u_r + \frac{1}{r^2} u_{\theta\theta} = 0$

$u(1,\theta) = g(\theta)$, $0 < \theta < \pi$

by separation of variables

let $u(r,\theta) = R(r)\Theta(\theta)$

$\Rightarrow R''(r)\Theta + \frac{1}{r} R'(r)\Theta + \frac{1}{r^2} R(r)\Theta''(\theta) = 0$

$\Rightarrow \frac{r^2 R''}{R} + \frac{r R'}{R} = -\frac{\Theta''}{\Theta} = K$

$\Rightarrow r^2 R'' + r R' - K R = 0$ $\quad \Theta'' + K\Theta = 0$

Θ is periodic function so

~~$K < 0 \Rightarrow K \neq 0$~~ if not $\Rightarrow \Theta = C_1\theta + C_2$ which is not periodic

$K < 0$ if not $\Rightarrow \Theta = C_1 e^{-\sqrt{K}\theta} + C_2 e^{\sqrt{K}\theta}$ which is not periodic

$\Rightarrow K > 0$ say $K = \lambda^2$

$\Rightarrow \Theta'' + \lambda^2\Theta = 0 \Rightarrow \Theta = C_1 \cos(\lambda\theta) + C_2 \sin(\lambda\theta)$

$\Rightarrow r^2 R'' + r R' + \lambda^2 R = 0$

$R = r^m \Rightarrow r(r-1) + r - \lambda^2 = 0$

$\Rightarrow r^2 - \lambda^2 = 0 \Rightarrow r = \lambda$, $r = -\lambda$

$\Rightarrow R = C_1 r^{\lambda} + C_2 r^{-\lambda}$

if $r \to 0 \Rightarrow r^{-\lambda} \to \infty \Rightarrow C_2 = 0$

$\Rightarrow R = C_1 r^{+\lambda}$

Then the solution is

$$u(r,\theta) = r^{\lambda}\left(C_1 \cos(\lambda\theta) + C_2 \sin(\lambda\theta)\right)$$

to be period $\Rightarrow \lambda = n$

$$\Rightarrow u_n(r,\theta) = r^n\left(C_1 \cos(n\theta) + C_2 \sin(n\theta)\right)$$

$$\Rightarrow u(r,\theta) = \sum_{n=0}^{\infty} r^n\left[a_n \cos(n\theta) + b_n \sin(n\theta)\right]$$

$$u(1,\theta) = g(\theta) \Rightarrow g(\theta) = \sum_{n=0}^{\infty}\left(a_n \cos(n\theta) + b_n \sin(n\theta)\right)$$

$$\Rightarrow a_0 = \frac{1}{2\pi}\int_0^{2\pi} g(\theta)$$

$$a_n = \frac{1}{\pi}\int_0^{2\pi} g(\theta)\cos(n\theta)\,d\theta$$

$$b_n = \frac{1}{\pi}\int_0^{2\pi} g(\theta)\sin(n\theta)\,d\theta$$

Q4

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i) ✓ The existence of $a u_{xx}$

ii) X The existence of -2

iii) ✓ $A=1, B=0, C=1 \Rightarrow B^2-4AC=-4<0$

iv) X The function must be piecewise Continuous,

v) ✓

$u_t = e^{\beta t} w_t + \beta e^{\beta t} w \qquad u_{xx} = e^{\beta t} w_{xx}$

$\Rightarrow u_t = \alpha^2 u_{xx} + \beta u \Rightarrow e^{\beta t} w_t + \beta e^{\beta t} w = \alpha^2 e^{\beta t} w_{xx} + \beta e^{\beta t} w$

$\Rightarrow e^{\beta t} w_t = \alpha^2 e^{\beta t} w_{xx} \Rightarrow w_t = \alpha^2 w_{xx}$

vi) X $(f*g)(t) = \int_{-\infty}^{\infty} f(t-s)\, g(s)\, ds$

vii) X $\mathcal{L}(\cos(2t)) = \frac{s}{s^2+4}$

viii) X of hyperbolic equation

ix) ✓ $u_x = 3F', \quad u_y = -4F' \Rightarrow 4u_x + 3u_y = 12F' - 12F' = 0$

x) X because $B^2-4AC = B^2 - 0 = B^2 > 0$ hyperbolic

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Student Course Evaluation Form

The purpose of this evaluation is to collect instructor feedback for improving this course and the Mathematics program. Information will also be used for program accreditation purposes.

I. Program Learning Outcomes Evaluations

Course Number/Name	Math 422 Introduction to partial differential equation	Semester	Second 1434/1435
Instructor	**Dr. Mohamed Herzallah**		
Student Name	----------	**Student ID**	----------

The course listed above is designed for students to achieve the following outcomes at a Not At All, Low, Low- Medium, Medium, Medium-High or High level.

Please mark (or type) High (5), Medium-High (4), Medium (3), Low-Medium (2), Low (1) or Not At All (0) indicating the level to which you believe, as an instructor, the students have achieved these outcomes in this course.

Program Learning Outcomes	5	4	3	2	1	0
a1. Apply fundamentals and concepts of mathematics.	*					
a2. Apply fundamentals and concepts General sciences and Computer skills.			*			
a3. Realize Social and ethical values.		*				
b1. Read and construct mathematical arguments and proofs.	*					
b2. Apply critical thinking skills to solve problems that can be modeled mathematically.	*					
c1. Work independently and within a team		*				
c2. Bear responsibility for different situations.		*				
c3. Realize codes of ethics and their importance.		*				
d1. Communicate a depth and breadth of mathematical knowledge, both orally and in writing.	*					
d2. Ability to Organize, connect and communicate mathematical and algorithmic ideas.	*					
d3. Critically interpret numerical and graphical data.		*				
e1. Use computer and its applications as an office tool				*		

II. Catalog Description , and Course Prerequisites Evaluations:

Based on your experiences in the course, please respond by circling the most appropriate number. Circle N/A for items that are not applicable, or if you have no opinion.

Catalog Description 1434-1435	• **Clssification and Formation of Partial Differential Equation** • **First-order linear P.D.E.** • **Solution using Lagrange's method** • **Cauchy problem** • **Second-order linear P. D. E. in several variables** • **Physical application using separation of variables** • **Classifications of P.D.E.** • **Some boundary value problems** • **Green's function.**						
Course Prerequisites:	Math321	**Circle One (5=Strongly Agree; 1=Strongly disagree)**					
2a. Do you believe that the catalog description (above) is accurate for this course?		**5**	**4**	**3**	**2**	**1**	**N/A**
2b. Do you believe that the course prerequisites (above) are appropriate for this course?		**5**	**4**	**3**	**2**	**1**	**N/A**
2c. If not, please list any prerequisites you believe are not appropriate for this course.							

III. Textbook(s) and/or Lab Manuals (if applicable) Evaluations:

Textbook(s) and/or Lab Manuals (if applicable):	• **Stanley J. Farlow,** Partial Differential Equations for Scientists and Engineers, Dover Publication, INC. New York, 1993. • **Echko, Principles of Partial Differential Equations, Springer, 2009.**	**Circle One (5=Strongly Agree; 1=Strongly Disagree)**					
3a. In general, do you believe this to be an appropriate textbook for this course?		**5**	**4**	**3**	**2**	**1**	**N/A**
3b. Was the organization of the textbook appropriate for this course?		**5**	**4**	**3**	**2**	**1**	**N/A**
3c. Was the level of the textbook appropriate for this course?		**5**	**4**	**3**	**2**	**1**	**N/A**

IV. Computer usage (if applicable) Evaluations:

Computer usage (if applicable):		**Circle One (5=Strongly Agree; 1=Strongly Disagree)**					
4a. Was the use of computer well integrated with the course?		**5**	**4**	**3**	**2**	**1**	**N/A**
4b. Was the computer lab adequately equipped with well-maintained and updated computers?		**5**	**4**	**3**	**2**	**1**	**N/A**
4c. Was the computer lab equipped with sufficient number of computers?		**5**	**5**	**5**	**2**	**1**	**N/A**
4d. Were the special software packages (MATLAB, SPSS, C+, FORTRAN, etc) available and accessible?		**5**	**4**	**3**	**2**	**1**	**N/A**
4e. Was adequate technical support available when needed?		**5**	**4**	**3**	**2**	**1**	**N/A**

جامعة المجمعة

كلية العلوم بالزلفي

نموذج تحويل العلامات النهائي من مئوي الى أحرف لطلبة البكالوريوس

الفصل الدراسي	الثاني	١٤٣٤/١٤٣٥	الترم الثاني
القسم	الرياضيات	رقم المادة	math422+mat423
استاذ المادة	د. محمد أحمد السيد حرزالله	اســـــم المـــــــادة	معادلات تفاضلية جزئية
عدد الطلبة المسجليـــن	15	عدد الطلبة الغائبين عن التهائي	0
عدد الطلبة النـــاجحين	13	عدد الطلبة الراسبين	0
متوسط الدرجات	2.58	العلامة الدنيا	F
الدرجـة العليـــــا	A +	نسبة النجاح	86.67%

Average	Percentage	SUM	Count	TO	From	Average
	0	0	0	100	95	A+
	6.66666667	4.75	1	94	90	A
	6.66666667	4.5	1	89	85	B+
	0	0	0	84	80	B
	6.66666667	3.5	1	79	75	C+
	13.3333333	6	2	74	70	C
	26.6666667	10	4	69	65	D+
	26.6666667	8	4	64	60	D
	13.3333333	2	2	59	0	F
	2.58	100	38.8	15	Total Students	

الرقم	العلامة	التقدير
1	65	D+
2	43	F
3	71	C
4	65	D+
5	41	F
6	67	D+
7	76	C+
8	91	A
9	60	D
10	85	B+
11	67	D+
12	70	C
13	60	D
14	60	D
15	60	D
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