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	☐ ☐ ☑ ☐ ☐ ☐				
	1		1		， ， ， ，
	16		16		0
A					
B					
C	MOOC				
D ( )					
E	1 3.2 2 4.1 3 2.3 4 8.2 5 7.1				

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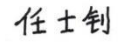
H			
	1. 2. 3.		
I	1. CD 2. 3. ☑ ☑ ☑ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ _____( )		
J	“ ” 1. 2. 3.		

K								
			%	%	%	%	%	
	1 15%		2		4	2	5	-
	2 39%		6	7	8		15	-
	3 20%	1. 2.	3	7	6		9	-
	4 14%	1. 2.	5	2			6	-
	5 12%	1. 2.	4			4	5	-

		20	16	18	6	40	-
L	1. 2.						
M							
	A—M						
	   2022 8 23						
	 2022 8 23						

**

	X 90	80 X 90	70 X 80	60 X 70	
1.					
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3.					
4.					

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	3	2.3.	2	
	4	8.2.	8	
	5	7.1.	7	
F				
		:	1 2 3 4 5	12
		n	1 2 3 4	12
		Rolle Lagrange Cauchy Taylor L′Hospital		
		. . . . .	… 1 2 3 4	12

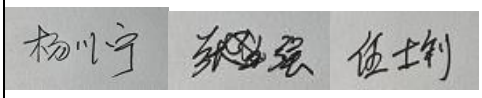
	. . . . Newton —— Leibniz . . . . Newton —— Leibniz .		
	. . . .

	1. 2. 3.		
I	4. CD 5. 6. ☑ ☑ ☑ ☐ ☑ ☐ ☑ ☐ ☐ ☐ ☐ _____( )		
J	“ ” 2. 2. 3.		

%	%	%	%	%	

1.

K 1 13% 2.

	5 13%	1. 2. 3.	4			4	5	-
			20	16	18	6	40	-
L	1. 2.							
M	**							
	A—M							
	 2022 8 23							
	2022 8 23							

		X 90	80 X 90	70 X 80	60 X 70	60
M	1. 1 2 3 4 5 6 2.	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6	1 2 3 4 5 6

	3.					
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	-1				0711330504
	☐ ☐ ☑ ☐ ☐ ☐				
	1		3		
	48		48		
	MOOC				
A	. ( ) [M]. 2017.				
B	[1] . [M]. : ,2002. [2] , . [M]. : ,1994. [3] . [M]. : ,1990. [4] . [M]. : ,2019. [5] . [M]. : 2002.				
C	1. PPT 2. MOOC				
D ( )					
E	1 B1 2 B2 3 A2				

	4 B2 5		D1;D2
	1		B1
	2		B2
	3		A2
	4		B2
	5		D1 D2
F			
	0	1 2 3 4 5	2
	1 54	1 2 3 4 5	6
	2	1 2 3 4 5	7

	π		

3

	7 pH	1 2 3 4 5	6
	8 -	1 2 3 4 5	6
			42
G			
H			
I	7. 8. 9.		CD

	☑ ☑ ☑ ☑ ☑ ☐ ☐ ☐ ☐ ☐ ☐ _____( )
J	“ ” 1. 3 2. 3.

				(%)	(%)	(%)	(%)	(%)	

1 40%

K

	A—M	
	2022 9 8	任士钊 2022 8 23

-1

		X 90	80 X 90	70 X 80	60 X 70	60
	1.					
M	2.					
	3.					

	4.					
	5.					

-2

	-2				0711330505
	☐ ☐ ☑ ☐ ☐ ☐				
	2		3		
	48		48		
	MOOC				
A	. ( ) [M]. 2017.				
B	[1] . [M]. : ,2002. [2] , . [M]. : ,1994. [3] . [M]. : ,1990. [4] . [M]. : ,2019. [5] . [M]. : 2002.				
C	1. PPT 2. MOOC				
D ( )					

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B1
2
B2
3
A2
4
B2
5

D1;D2</td></tr>
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<tr><td>2</td><td></td><td>B2</td></tr>
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D2</td></tr>
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3 4 5</td><td>2</td></tr>
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	12	1 2 3 4 5	6
	13	1 2 3 4 5	6
	14 +3	1 2 3 4 5	6
	15		4

		1 2 3 4 5	
	16

	20 +2 +3 +2 +3	1 2 3 4 5	4
			48

G

			(%)	(%)	(%)	(%)	(%)	
K	1 40%		8		8	4	20	-
	2 30%		6		6	3	15	-
	3 10%		2		2	1	5	-
	4 10%		2		2	1	5	-
	5 10%		2		2	1	5	-
			20		20	10	50	-
L	1. 2.							
M	-2							
	A—M							
	2022 2 20		任士钊 2022 2 20					

	( )				0713310506
	☐ ☐ ☑ ☐ ☐ ☐				
	1		1		
	32		0		32
	( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )				
A	[1] . ( )[M]. : 2001. [2] . [M]. : ,2004. [3] . [M]. : 2007.3 “ ”				
B	[1] . [M]. : ,2006. [2] . [M]. 2004. [3] . [M]. : ,2009.				
C	PPT				
D ( )					

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2
B1-1
3
; B1-1 D1 D2
4
A1-1 A2-1 D1</td></tr>
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<tr><td>2</td></tr>
<tr><td>3</td><td>B1-1
D1
D2</td><td>(B)
(D)</td></tr>
<tr><td>4</td><td>A1-1
A2-1
D1</td><td>(A)
(D)</td></tr>
<tr><td rowspan="3">F</td><td colspan="2"></td><td></td></tr>
<tr><td colspan="2">-</td><td>-</td></tr>
<tr><td colspan="2"></td><td>-</td></tr>
</table>

G			
		1 2 3 4	4
	1 40 ml 20% 2 0.5 g 5 ml 6 M 5 2 0.001 100 2M NaOH 3	1 2 3 4	4
	1 100 ml 1~2 mL $FeCl_3$ 2 2.1 2.2 20 ml 20 ml 5 ml 2.3 20 ml 3	1 2 3 4	4

	1 10 g 2 5 g 6 ml 3 1 g 1 g / 200℃ 1 4	1 2 3 4	4
	1 6 g 40 ml 3 M 1 pH pH>2 2 20 ml 3	1 2 3 4	4
	Fe(III) 1 2 Fe(III) 3	1 2 3 4	4

	1 50 g 250ml 100 ml 15 10 ml 40/60/80 ℃ 10 ml 2 50 g 250ml 100 ml 40/60/80 ℃ 10 ml 3	1 2 3 4	4
	1 100 ml 10 g 11.3 g 30 ml 2/3 2 0.2 g 2 0.2 g 1 ml 2 0.1 M 3	1 2 3 4	4
	1 2	1 2 3 4	4
			32
H			
		-	-

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☑ ☐ ☑ ☐
☐ ☐ ☐ _____( )</td></tr>
<tr><td>J</td><td colspan="7"></td></tr>
<tr><td rowspan="6">K</td><td></td><td></td><td colspan="4"></td><td rowspan="2"></td></tr>
<tr><td></td><td></td><td>%</td><td>%</td><td>%</td><td>%</td><td>%</td></tr>
<tr><td>1 25%</td><td>1.
2.</td><td>0</td><td>75</td><td>0</td><td>0</td><td>25</td><td>-</td></tr>
<tr><td>2 30%</td><td>1.
2.</td><td>0</td><td>75</td><td>0</td><td>0</td><td>25</td><td>-</td></tr>
<tr><td>3 30%</td><td>1.
2.
;
3.</td><td>0</td><td>75</td><td>0</td><td>0</td><td>25</td><td>-</td></tr>
<tr><td>4 15%</td><td>1.
2.
3.
4.</td><td>0</td><td>75</td><td>0</td><td>0</td><td>25</td><td>-</td></tr>
<tr><td colspan="2"></td><td></td><td>75</td><td></td><td></td><td>25</td><td>-</td></tr>
<tr><td>L</td><td colspan="7">1.
2.
3.</td></tr>
<tr><td>M</td><td colspan="7">( )</td></tr>
<tr><td></td><td colspan="7">A—M</td></tr>
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	-				0713310506
	☐ ☐ ☑ ☐ ☐ ☐				
	1		1		
	32		0		32
	( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( )				
A	[1] . ( )[M]. : 2001. [2] . [M]. : ,2004. [3] . [M]. : 2007.3 “ ”				
B	[1] . [M]. : ,2006. [2] . [M]. 2004. [3] . [M]. : ,2009.				
C	PPT				
D ( )					

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B1-1
2
B1-1
3
; B1-1 D1 D2
4
A1-1 A2-1 D1</td></tr>
<tr><td></td><td></td><td></td></tr>
<tr><td>1</td><td rowspan="2">B1-1</td><td rowspan="2">(B)</td></tr>
<tr><td>2</td></tr>
<tr><td>3</td><td>B1-1
D1
D2</td><td>(B)
(D)</td></tr>
<tr><td>4</td><td>A1-1
A2-1
D1</td><td>(A)
(D)</td></tr>
</table>

F

G			
	1 1 2 3	1 2 3 4	4
	2 1 2	1 2 3 4	4
	3 1 2 3 4 pH	1 2 3 4	4

	4 C 1 C 2	1 2 3 4	4
	5 1 2 3	1 2 3 4	4
	6 1. 2.	1 2 3 4	4

	7 1 2	1 2 3 4	4
	8 1 $K_3Fe[(C_2O_4)_3]$ $3H_2O$ 2 3	1 2 3 4	4

			32
H			
		-	-
I	☑ ☐ ☐ ☐ ☑ ☐ ☑ ☐ ☐ ☐ ☐ _____( )		
J			

K			%	%	%	%	%	
	1 25%	1. 2.	0	75	0	0	25	-
	2 30%	1. 2.	0	75	0	0	25	-
	3 30%	1. 2. ; 3.	0	75	0	0	25	-
	4 15%	1. 2. 3. 4.	0	75	0	0	25	-
				75			25	-

L	1. 2. 3.
M	
	A—M

M		X 90	80 X 90	70 X 80	60 X 70
	1.				
	2.				
	3. ;	;	;	;	;
	4.				

M		X 90	80 X 90	70 X 80	60 X 70
	1.				
	2.				
	3. ;	;	;	;	;
	4.				

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D			1 1. , 2. , : 3. 4. : 5. , , , , 6. t 7. Q 8.

			2 1. , (KaKb) 2. 3. —— : 4. 5. 6. pH 7. C Ea.Kb 8. . 9. 10. 11. 12.
			3 1. , , 2. , 3. , 4. , 5. , 6.
			4 1. , Nernst 2. , ,

			, , 3. , , , 4. : ,
			5 1. , ε S 2. 3. 4. 5.

E					
			3		3
			6	1	7
			8	1	9
			8	2	10
			8	1	9
			3		3

	1		1 2			
	2-3		1 2 3 4 5			
	4-6		1 2 3 4 5			
	7-9		1 2 3 4 5		,	
	10-12		1 2 3 4 5		,	
	13		1 2 3 4 5		, ;	

	14-15		1 2 3			
H						
	20%				20%	1 2 3 4 5
	20%			20%		1 2 3 4 5
	60%		1 ~30 ~40 ~15 ~15 2 40 30 20 10%		60%	1 2 3 4 5
I	[1] 2002 [2] 2009 [3] [4] 1993 [5] Umland J B.et al.Genral Chemistry.2nd ed.,West Publishing Company,1996					

J	
K	
1. F—J 2. (1) (2) (3) (4)	

			074493
			1
	2		32
A			
B	“ ”		
C	1 2 3 4 5 6 7 8		

D			
	5.		1-4
	8.		1-6
	10.		4
	11.		4
	13.		6
E			
		2	2
		4	4
		4	4
		5	5
		5	5
		5	5
		3	3
		4	4

	20%	5 3 0.5 / 1~2 15 8 0.5 0.5 3 0.5~1	1-7
	.....		
	80%	+	1-7
I	2019.1 .	.	
J			
K	1. H O		

1. F—J

2.

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	-1			0711330510
	■			
	√			3
	1		48	0
A	-2			
B				
C	1. 2. 3. 4. 5.			

D			
	A.	A1 2	5 6
	B.	B1 B2	1 2 3 4 5 6
	C.	C1 C2	1 2 3 4 5
	D.	D1 D2	1 2 3 4 5

E				
		3	0	3
		4	0	4
		5	0	5
		4	0	4
		4	0	4
		4	0	4
		4	0	4
		4	0	4
		4	0	4
		6	0	6
		4	0	4
		6	0	6
		48	0	48

F	√ √ √					
G				3		
	1		1 4 5 6	——		
	2	+	1 4 5 6			
	3		1 2 3 4 5 6			
	4	+	1 2 3 5 6			
	5		1 2 3 4 6			
	6		1 2 3 5 6			

	7		1 2 3 5 6			
	8		1 2 4 5 6			
	9		1 3 4 6			

10

	20		1 2 4 5 6			
	21		1 2 3 4 5 6			
	22		1 2 3 5 6			
	23		1 2 4 5 6			
	24		1 2 4 5 6			
H						
	50%		15% 35%		1 2 3 4 5	
	25%		1-6		1 2 3 4 5	
	25%		7-11		1 2 3 4 5	
I	1. , 2006 5 . 2 , . , ,2005 , , . 3 . , ,2004 , .					
J	PPT					
K						

1. F—J

2.

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(4)

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	1. 2.		4
	1 2		3
	1 2		4
	1- 1 ,		4
	1. 2 3		6
	1 2 3		4
	1 2 3		4
			32

F						
G						
			1 5 6			
			1 2 5 6			
			1 2 5 6	“ ” “ ”		

1 2

3 4 5 6

			1 2 3 4 5 6			
			1 2 3 4 5 6			
			1 2 3 4 5 6			
H						
	50%		10 5 1-3 20 A A- B C A A- 3 B 6 C 9 3. 20 A A- B C A A- 3 B 6 C 9		1 2 3 4 5 6	
	50%				1 2 3 4 5 6	
I	1. 2. 3. 4. 5. 6. 7.					

J	
K	
1. F—J 2. (1) (2) (3) (4)	

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				0711330519
				3
	3		48	
A				
B				
C	1. 2. 3. 4. 5.			
D				
	1. 2.	1	1. 2. 4. 5.	

		. 2	
	3.	3	3. 4.
	4.	4	4.
	7. 8.	7 8	4. 5.
E			
	1	1	1
	2	5	5
	3	6	6
	4	3	3
	5	4	4
	6	5	5

	7	6		6
	8	3		3
	9	9		9
	10	6		6
		48		48
F				

				3		
2G	1	1 1.1 1.2 1.3 2 2.1	1,2,3			,
	2	2.2 2.3				

	3	2.4 2.5 2.6	1,2,3,4,5			,
	4	3 3.1 3.2 3.3 3.4	1,2,3,4,5			,

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	7	4 4.1 4.2	1,2,3,4,5			,
	8	4.3 4.4 5 5.1 5.2	1,2,3,4,5			,
	9	5.3 5.4 5.5	1,2,3,4,5			,
	10	5.6 5.7 6 6.1	1,2,3,4,5			,
	11	6.2 6.3 pH 6.4	1,2,3,4,5			,

	12	6.5 6.6 6.7 6.8 6.9	1,2,3,4,5			,
	13	7 7.1 7.2 -	1,2,3,4,5			,
	14	7.3 -- 7.4 7.5	1,2,3,4,5			,
	15	7.6 7.7 7.8 7.9 7.10 7.11	1,2,3,4,5			,
	16	8 8.1	1,2,3,4,5			

		8.2 8.3				,
	17	8.4 8.5 9 9.1	1,2,3,4,5			,
	18	9.2 9.3	1,2,3,4,5			,
	19	9.4	1,2,3,4,5			,
	20	9.5 9.6	1,2,3,4,5			,

	21	9.7 9.8 9.9	1,2,3,4,5			,
	22	10 10.1 10.2	1,2,3,4,5			,
	23	10.3 10.4	1,2,3,4,5			,
	24	10.5 10.6	1,2,3,4,5			,
H						
	20%		14 5		1,2,3,4,5	

		14 6 2 3 6	
	20%		1,2,3,4,5
	60%		1,2,3,4,5
I	. ( ) “ ” 2019-12		),
J	PPT		
K	1. F K 2.		
1. F—J 2. (1) (2) (3) (4)			

			0713310520
			1
	3		32
A			
B			
C	1. 2. 3. 4. 5. 6.		
D			
	3. 4.	1	1. 2. 3.

		2 .	4. 5.	
	3.	3	3. 4.	
	4.	4	4. 5. 6.	
	7. 8.	7 8	3. 4. 5. 6.	
	13.	13	6.	
E				
			4	4
			4	4

		4	4
		4	4
		4	4
		4	4
		4	4
	- GC-MS	4	4
		32	32
F			

G				3		
	1		1,2,3,4,5,6			
	2		1,2,3,4,5,6			

	3		1,2,3,4,5,6	2005		
	4		1,2,3,4,5,6			
	5		1,2,3,4,5,6			

				“ ”		
	6		1,2,3,4,5,6			
	7		1,2,3,4,5,6			
	8	- GC-MS	1,2,3,4,5,6			
H				40		
		50%		10 3 10	1,2,3,4,5,6	
		50%				

1. F—J

2.

(1)

(2)

(3)

(4)

_____ ( )

				071252 0530
	☑			
	☑			2
	2		32		16
A				
B	21 office endnote origin matlab chemoffice			

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2.
3.
4.
5.
6.</td></tr>
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<tr><td></td><td></td><td colspan="2">5,6</td></tr>
<tr><td></td><td></td><td colspan="2">1,2,3</td></tr>
<tr><td></td><td></td><td colspan="2">3,4</td></tr>
<tr><td></td><td></td><td colspan="2">4,5,6</td></tr>
<tr><td rowspan="3">E</td><td colspan="2"></td><td colspan="2"></td></tr>
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<tr><td colspan="2">Office
office
ffice
word excel ppt</td><td>3</td><td>5</td><td>8</td></tr>
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		2	2	4
	endnote	2	2	4
	origin	3	3	6
	chemoffice	2	2	4
	matlab	2	2	4
		16	16	32

F	☑ ☑ ☑ ☑ _____

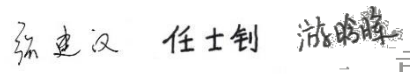
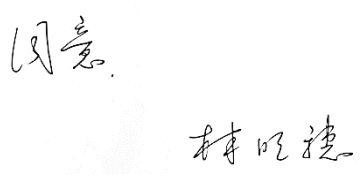
G				3		
	1		1,5,6			
	2	Office	1,2,4			+
	3	Office	1,2,4			+
	4	Office	1,2,4			+
	5		1,2,3,4			+

2

	6	Endnote	1,2,3,4			+
	7	Endnote	1,2,3,4			+
	8	Origin	1,2,3,4			+
	9	Origin	1,2,3,4			+
	10	Chemoffice	1,2,3,4,5,6			+
	11	Matlab	1,2,3,4 5 6			+

H

40% 1,2,3,4

1. F—J 2. (1) (2) (3) (4)	
	任士钊 2022 2 20
	 2022 2 20
	 2022 2 20

21 ( ) ( )

				2
	3		32	0
A				
B	PPT			( )
C	1. 2. 3. 4. 5. 6.			

D			
	1	1-1	1 3
	2	2-1	2 3
	3	3-1	1 3
	4	4-1	2 3

E				
		2		2
		4		4
		2		2
		2		2
		2		2
	S	2		2
	p	2		2
	d -	4		4
	d -	2		2
	d -	4		4

		5.4 5.5 5.6				
	8	p 6.1 6.2 6.3 6.4				
	9	7.1 7.2 7.3				
	10	7.4 7.5 7.6				
	11	8.1d 8.2 8.3 8.4 8.5BB 8.6				
	12	9.1 9.2 9.3 9.4				
	13	9.5 9.6 9.7 9.8 9.9				
	14	10.1 10.2 10.3 10.4 10.5 10.6				
	15	11.1 11.2 11.3 11.4				
	16	12.1 12.2 12.3 12.4 12.5 12.6				
H						

	30%	10 7 0.5 / 1~3 5 0.5 1 10	
	70%		