Listes et matrices
QCM 3
1er décembre 2025

1. **La méthode de recherche la plus naïve dans une liste est**
   (a) la recherche séquentielle
   (b) la recherche autoadaptative
   (c) la recherche dichotomique

2. **La recherche séquentielle est implémentable sur**
   (a) les listes chaînées
   (b) les listes doublement chaînées
   (c) les listes statiques
   (d) aucune des précédentes

3. **La complexité de la recherche séquentielle négative est**
   (a) constante
   (b) logarithmique
   (c) linéaire
   (d) quadratique

4. **La recherche dichotomique est implémentable sur**
   (a) les listes chaînées
   (b) les listes doublement chaînées
   (c) les listes statiques
   (d) aucune des précédentes

5. **La complexité au pire de la recherche dichotomique est**
   (a) constante
   (b) logarithmique
   (c) linéaire
   (d) quadratique

6. **Soient *gauche* et *droite*, les deux indices délimitant la sous-liste de L sur laquelle une recherche dichotomique de la valeur x est faite.**
   La recherche est négative si
   (a) ième$(L, (gauche + droite)$ div $2) \neq x$
   (b) $gauche = droite$
   (c) $gauche > droite$

Soit la liste triée λ suivante :

$$\lambda = \{1, 3, 8, 15, 23, 29, 32, 35, 38, 43, 47, 51, 55\}$$

7. **Dans le cas de la recherche séquentielle de la valeur $x = 32$ dans la liste λ, combien de valeurs de la liste seront comparées à x ?**
   (a) 1
   (b) 4
   (c) 6
   (d) 7 ✓
   (e) 13

8. **Dans le cas de la recherche dichotomique de la valeur $x = 32$ dans la liste λ, combien de valeurs de la liste seront comparées à x ?**
   (a) 1 ✓
   (b) 4
   (c) 6
   (d) 7
   (e) 13

9. **Dans le cas de la recherche séquentielle de la valeur $x = 30$ dans la liste λ, combien de valeurs de la liste seront comparées à x ?**
   (a) 1
   (b) 4
   (c) 6
   (d) 7 ✓
   (e) 13

10. **Dans le cas de la recherche dichotomique de la valeur $x = 30$ dans la liste λ, combien de valeurs de la liste seront comparées à x ?**
    (a) 1
    (b) 4 ✓
    (c) 6
    (d) 7
    (e) 13

QCM 6

lundi 1 décembre

Question 11

Soit (u_n) la suite définie par : $\forall n \in \mathbb{N}$, $u_{n+1} = u_n^2 - n + 3$ avec $u_0 = 4$. On a :

a. $u_1 = 19$

b. $u_1 = 18$

c. Aucune des autres réponses

Question 12

Soit (u_n) une suite. Dire que cette suite est bornée signifie :

a. $\forall n \in \mathbb{N}$, $\exists M \in \mathbb{R}$ tel que $|u_n| \leq M$

b. $\exists M \in \mathbb{R}$ tel que $\forall n \in \mathbb{N}$, $|u_n| \leq M$

c. $\forall n \in \mathbb{N}$, $\forall M \in \mathbb{R}$, $|u_n| \leq M$

d. $\exists M \in \mathbb{R}$ et $\exists n \in \mathbb{N}$ tels que $|u_n| \leq M$

e. Aucune des autres réponses

Question 13

Cochez la(les) suite(s) croissante(s) :

a. $(\sqrt{n})$

b. $(n - 100)^2$

c. $\left(\frac{1}{n+1}\right)$

d. $((-1)^n n)$

e. Aucune des autres réponses

3

Question 14

Soit (u_n) une suite vérifiant : $\forall \varepsilon > 0, \exists N \in \mathbb{N}, \forall n \in \mathbb{N}, \ (n \geq N \implies |u_n| < \varepsilon)$

Cela signifie que :

a. $\lim\limits_{n \to +\infty} u_n = +\infty$

b. $\lim\limits_{n \to +\infty} u_n = -\infty$

c. $\lim\limits_{n \to +\infty} u_n = 0$ ✓

d. Aucune des autres réponses

Question 15

Soient (u_n) et (v_n) telles que $\lim\limits_{n \to +\infty} u_n = 0^+$ et $\lim\limits_{n \to +\infty} v_n = +\infty$. Alors,

a. $\lim\limits_{n \to +\infty} u_n - v_n = +\infty$

b. $\lim\limits_{n \to +\infty} u_n \times v_n = 0^+$

c. $\lim\limits_{n \to +\infty} \dfrac{u_n}{v_n} = 0^+$ ✓

d. $\lim\limits_{n \to +\infty} \dfrac{v_n}{u_n} = 0^+$

e. Aucune des autres réponses

Question 16

Soient (u_n) et (v_n) deux suites telles que : $\forall n \in \mathbb{N}, 0 \leq u_n \leq v_n$. On a :

a. Si (v_n) converge vers 1 alors (u_n) converge vers 1

b. Si (v_n) converge vers 0 alors (u_n) converge vers 0 ✓

c. Si (v_n) tend vers $+\infty$ alors (u_n) tend vers $+\infty$

d. Si (u_n) et (v_n) convergent alors $\lim\limits_{n \to +\infty} u_n \leq \lim\limits_{n \to +\infty} v_n$ ✓

e. Aucune des autres réponses

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Question 17

Cochez la(les) suite(s) convergente(s) :

a. (n)

b. $\left(\frac{1}{n+1}\right)$

c. $(\cos(n))$

d. $\left(\frac{n+1}{\sqrt{n+1}}\right)$

e. Aucune des autres réponses

Question 18

Cochez la(les) affirmation(s) correcte(s)

a. Si une suite tend vers $+\infty$ alors elle est croissante.

b. Si une suite converge alors elle est bornée.

c. Si une suite est bornée alors elle converge.

d. Si (u_n) est une suite telle que $u_1 - u_0 > 0$ alors (u_n) est strictement croissante.

e. Aucune des autres réponses

Question 19

Soit $q \in \mathbb{R}$. Pour quelle(s) valeur(s) de q la suite (q^n) est-elle divergente ?

a. $q = 1$

b. $q = 2$

c. $q = -\frac{1}{2}$

d. $q = -2$

e. Aucune des autres réponses

5

Question 20

La somme $\sum_{k=0}^{20} 3^k$ est égale à

a. $\dfrac{3^{20}-1}{2}$

b. $\dfrac{1+3^{21}}{4}$

c. $\dfrac{3^{21}-1}{2}$

d. $-\dfrac{1}{2}$

e. Aucune des autres réponses

6

QCM Electronique – InfoS1

Pensez à bien lire les questions ET les réponses proposées

Q21. L'intensité du courant qui entre dans une résistance est la même que celle de celui qui en ressort.

a. VRAI

b. FAUX

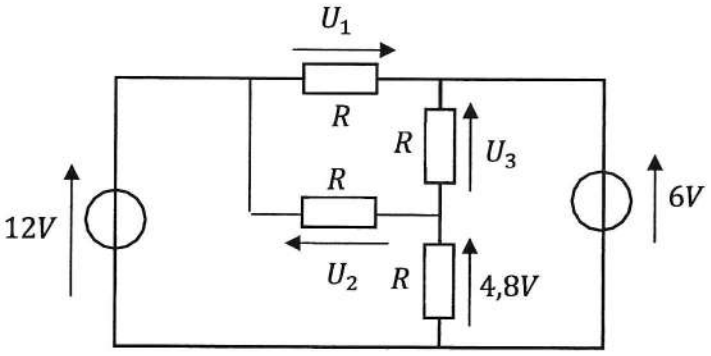
Q22. Que vaut la tension U_2 ?

a. 6V

b. $-6V$

c. 7,2V

d. 13,2V



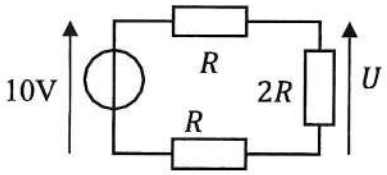
Q23. Soit le circuit ci-contre. Que vaut U ?

a. 2,5 V

b. -2,5 V

c. 5V

d. 7,5 V



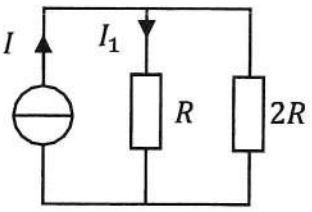
Q24. Soit le circuit ci-contre. Quelle est l'expression de l'intensité I_1 ?

a. $I_1 = \frac{2}{3} \cdot I$

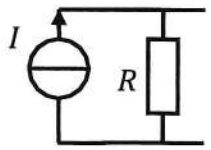
b. $I_1 = \frac{2}{5} \cdot I$

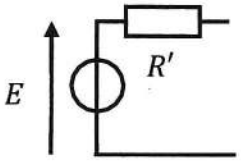
c. $I_1 = \frac{1}{3} \cdot I$

d. $I_1 = \frac{1}{5} \cdot I$



On considère les 2 circuits suivants :





Ces 2 circuits sont équivalents si et seulement si :

Q25. $R' =$

a. R /

b. $\frac{R.R'}{R+R'}$

c. $\frac{R}{R+R'}$

d. Aucune de ces réponses

Q26. $I =$

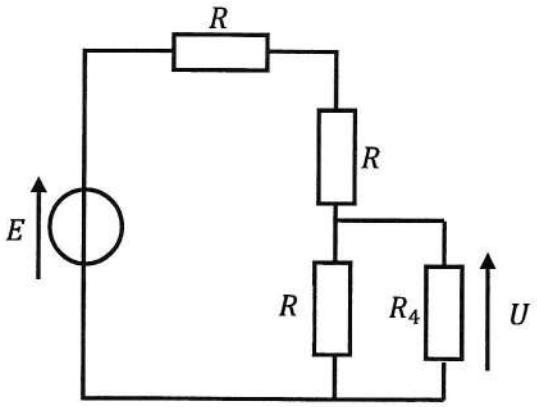
a. E

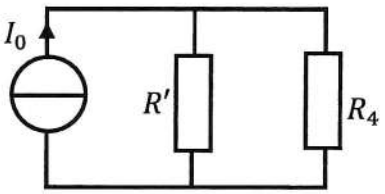
b. $R'.E$

c. $\frac{R'.R}{R+R'}.I$

d. $\frac{E}{R'}$ /

On considère les 2 circuits suivants (Q27&28) :





Q27. Ces 2 circuits sont équivalents si et seulement si :

a. $I_0 = \frac{E}{2R}$ et $R' = 2R$

b. $I_0 = \frac{E}{2R}$ et $R' = \frac{2}{3}.R$ /

c. $I_0 = \frac{E}{R}$ et $R' = R$

d. $I_0 = \frac{E}{R}$ et $R' = \frac{R}{2}$

Q28. Quelle est l'expression de U si $R_4 = R$?

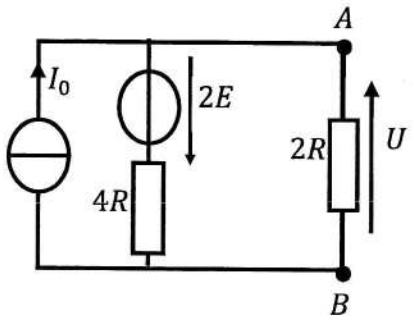
a. $U = E$

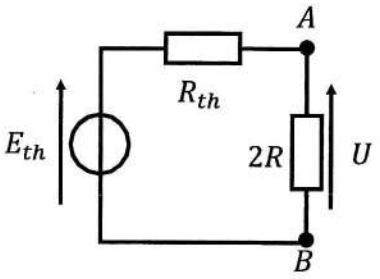
b. $U = \frac{E}{4}$

c. $U = \frac{E}{2}$

d. $U = \frac{E}{5}$ /

On considère les 2 circuits suivants (Q29&30) :





Q29. Ces 2 circuits sont équivalents si et seulement si :

a. $E_{th} = 2E$ et $R_{th} = 4R$

b. $E_{th} = 2E - 4RI_0$ et $R_{th} = 4R$

c. $E_{th} = 4RI_0 + 2E$ et $R_{th} = 4R$

d. $E_{th} = 4RI_0 - 2E$ et $R_{th} = 4R$

Q30. Quelle est l'expression de U ?

a. $U = 2E$

b. $U = \frac{R_{th}}{R_{th}+2R}.E_{th}$

c. $U = E_{th}$

d. $U = \frac{2R}{R_{th}+2R}.E_{th}$

ADP MCQ2 B2

1/12/25

Grammar

Choose the correct answer for the following sentences:

31.Harry ___ to contact his uncle several times.

A) has tried

B) tried

C) was tried

D) trying

32. I haven't been to the library ___ months. Have you?

A) since

B) two

C) for

D) in

33. Rachael ____ her video project two hours ago.

A) has finished

B) was finishing

C) had finished

D) finished

34. Norita ____ to the museum several times since _____.

A) went / a long time

B) has been / last year

C) have been / two years

D) went / one year ago

10

35.They ____ in Egypt since January 2015. They like it a lot.

A) are living

B) lived

C) have lived X

D) had lived

36. Robert is going to be famous someday. He _____ in three movies already.

A) appeared

B) has been appeared

C) has appeared

D) will appeared

37. Luc ____ the driving test three times so far.

A) has failed

B) is failing

C) failed

D) will fail

38. Stephanie ____ a journalist ____ ten years, from 2002 to 2012.

A) has been, since

B) is, for

C) is, since

D) was, for

39. My parents _____ to Germany, Korea and Canada ____ this year.

A) traveled / so far

B) have traveled / so far

C) have traveled / for

D) is travelling / so far

40.My sister hasn't graduated from the university ___.

A) still

B) already

C) yet

D) always

AI Is Accelerating the Loss of Our Scarcest Natural Resource: Water

Water covers 70% of the Earth, and it is our most essential and important ingredient to survive—for all living things. However, freshwater—what we need to drink and irrigate our farms—is only 3% of the world's water, and over two-thirds of that is tucked away in frozen glaciers and unavailable for consumption.

Each day, we must consume water to survive. An adult male needs about 3 liters (3.2 quarts) per day while an adult female needs about 2.2 liters (2.3 quarts) per day.

As a result, some 1.1 billion people worldwide lack access to water, and a total of 2.7 billion find water scarce for at least one month of the year. Inadequate sanitation is also a problem for 2.4 billion people—they are exposed to diseases such as cholera and typhoid fever and other water-borne illnesses. Two million people, mostly children, die each year from diarrheal diseases alone.

According to the United Nations Environmental Report, nearly two-thirds of our world's population experiences severe water shortages for at least one month a year, and by 2030, this gap is predicted to become much worse, with almost half of the world's population facing severe water stress. To avoid this fate, the report said, water use must be "'decoupled' from economic growth by developing policies and technologies to reduce or maintain consumption without compromising performance."

The necessity for water is fundamental to our ability to live. However, we have a major problem, and it's accelerating. Our world is racing ahead to advance AI into every aspect of our lives. With the rise of generative AI, companies have significantly raised their water usage, sparking concerns about the sustainability of such practices amid global freshwater scarcity and climate change challenges.

Tech giants have significantly increased their water needs for cooling data centers due to the escalating demand for online services and generative AI products. AI server cooling consumes significant water, with data centers using cooling towers and air mechanisms to dissipate heat, causing up to 9 liters of water to evaporate per kWh of energy used.

The U.S. relies on water-intensive thermoelectric plants for electricity, indirectly increasing data centers' water footprint, with an average of 43.8L/kWh withdrawn for power generation.

Companies like Microsoft, Google, and Meta are vowing to mitigate their environmental impact by aiming to replenish more water than they consume by 2030 through various ecological projects. But it's not clear how they'll be able to do that when there's simply not enough water.

Google's water commitment recently stated: "Fresh, clean water is one of the most precious resources on Earth ... we're taking urgent action to support water security and healthy ecosystems."

Already AI's projected water usage could hit 6.6 billion m^3 by 2027, signaling a need to tackle its water footprint.
Rising water use in data centers is very concerning due to the incredible global freshwater scarcity we have. CEOs and board directors investing in AI should reflect on these three questions:

1. What is the impact of your AI strategy on water consumption, and how are you planning to replenish what you are draining from the Earth?
2. Will your investments in AI create more social problems than benefits?
3. Have you quantified the social risks in your AI investment business cases, and is your board involved in reviewing the stakeholder and brand reputation risks to your ESG goals?

Holistic thinking is key to advance AI with corporate purpose. Our tech titans have opened the AI Pandora's box, and how we ethically take more social responsibility remains to be seen. This will require more regulation and scrutiny.

In closing, Antonio Guterres, UN Secretary General said at the UN Water Conference that "Water is a human right and the common development denominator to shape a better future. But water is in deep trouble."

Source Forbes Magazine, September, 2025

41) Where does most freshwater on earth come from?

a) From the ground
b) From natural springs
c) From lakes and rivers
d) From glaciers

42) According to the article the earth is covered by:

a) 3% water
b) 70% water
c) two thirds water
d) not nearly enough water

43) Which one of these is not a waterborne illness?

a) Dengue
b) Typhoid
c) Cholera
d) Diarrhea

44) In the sentence "Already AI's projected water usage could hit 6.6 billion m^3 by 2027" the word "hit" could best be replaced by:

a) reach
b) exceed
c) stabilize at
d) strike at

45) Companies like Google, Meta and Microsoft have promised to reduce their environmental impact by:

a) restoring more water than they use
b) reducing their water consumption significantly
c) purifying salt water
d) developing new technologies that reduce the water they use

46) How many people in the world do not have enough water for at least one month per year:

a) Billion
b) 2.7 billion
c) 2.4 million
d) 2 million

47) According to the United Nations Environmental Report, by 2030:

a) Many more people will die from water shortages
b) Companies will tackle the global water shortage problem through environmental projects
c) Nearly half of the world's population will experience very serious water stress

48) Which of the following explanations for how generative AI contributes to the global water shortage problem is not mentioned in the article:

a) Water is used to cool AI servers
b) The U.S. relies on water-intensive thermoelectric plants for electricity generation
c) Water is used to manufacture the hardware that makes AI possible

49) **What adjective best describes the UN Secretary General's vision of the current water situation in the world:**
   a) Worried
   b) Relieved
   c) Optimistic
   d) cautious

50) **What word is not appropriate to replace "benefits" in the question, "Will your investments in AI create more social problems than benefits?":**
   a) Profits
   b) Advantages
   c) Positive impacts
   d) Improvements