ALGO
QCM

1. **Les feuilles d'un ABR sont sur au plus deux niveaux ?**
   (a) vrai
   (b) faux

2. **La complexité au pire de la recherche négative par interpolation linéaire est d'ordre ?**
   (a) linéaire
   (b) logarithmique
   (c) quadratique
   (d) constant

3. **La complexité, en nombre de comparaisons, de la suppression d'un élément dans un A.B.R. se terminant sur un noeud v est ?**
   (a) 2*hauteur(v)+1
   (b) 2*hauteur(v)+2
   (c) hauteur(v)+1
   (d) hauteur(v)+2
   (e) Aucune des 4 propositions précédentes

4. **La représentation sous forme d'arbre binaire d'un arbre général est appelé ?**
   (a) injection premier fils frère droit
   (b) bijection premier fils frère droit
   (c) surjection premier fils frère droit
   (d) n'a pas de nom particulier

5. **La recherche par interpolation linéaire nécessite une structure statique de liste ?**
   (a) Vrai
   (b) Faux

6. **La complexité, en nombre de comparaisons, de l'ajout en feuille d'un élément dans un A.B.R. se terminant après un noeud v est ?**
   (a) 2*hauteur(v)+1
   (b) 2*hauteur(v)+2
   (c) hauteur(v)+1
   (d) hauteur(v)+2
   (e) Aucune des 4 propositions précédentes

7. **Les n-uplets permettent une représentation ?**
   (a) statique d'un arbre général
   (b) dynamique d'un arbre général

8. **La complexité, en nombre de comparaisons, de la recherche positive d'un élément dans un A.B.R. se terminant sur un noeud v est ?**
   (a) 2*hauteur(v)+1
   (b) 2*hauteur(v)+2
   (c) hauteur(v)+1
   (d) hauteur(v)+2
   (e) Aucune des 4 propositions précédentes

9. **Que l'ajout d'éléments se fasse en racine ou aux feuilles, l'arbre binaire de recherche obtenu est le même ?**
   (a) Vrai
   (b) Faux

10. **La hauteur d'un ABR peut être ?**
    (a) Une fonction quadratique de sa taille
    (b) Une fonction logarithmique de sa taille
    (c) Une fonction linéaire de sa taille
    (d) Une fonction exponentielle de sa taille

QCM 6

lundi 27 mars 2023

Question 11

Dans $\mathbb{R}^3$, on considère le sous-espace vectoriel $F = \{(x, y, z) \in \mathbb{R}^3,\ x + y = 0\}$. On a

a. $F = \text{Vect}\,(((1, -1, 0)))$

b. $F = \text{Vect}\,(((1, -1, 0), (0, 0, 1)))$

c. $F = \text{Vect}\,(((1, -1, 0), (0, 0, 1), (0, 0, 2)))$

d. Aucune des autres réponses

Question 12

Dans $\mathbb{R}^3$, on considère les espaces vectoriels

$$F = \{(x, y, z) \in \mathbb{R}^3,\ x + y + z = 0\} \text{ et } G = \{(x, y, z) \in \mathbb{R}^3,\ x = 0\}$$

On a

a. $F \cap G = \{(0, 0, 0)\}$

b. $F \cap G = \text{Vect}\,((0, -1, 1))$

c. F et G sont supplémentaires dans $\mathbb{R}^3$.

d. $\dim(F + G) = \dim(F) + \dim(G)$

e. Aucune des autres réponses

Question 13

Dans $\mathbb{R}_2[X]$, $F = \text{Vect}(1, X, 2X)$ est de dimension

a. 1

b. 2

c. 3

d. Aucune des autres réponses

Question 14

Parmi les applications suivantes, lesquelles sont linéaires ?

a. $f : \begin{cases} \mathbb{R}^2 & \longrightarrow & \mathbb{R}^2 \\ (x,y) & \longmapsto & (x+1, x+3y) \end{cases}$

b. $g : \begin{cases} \mathbb{R}^3 & \longrightarrow & \mathbb{R}^2 \\ (x,y,z) & \longmapsto & (x+y+z, x^2+3y) \end{cases}$

c. $h : \begin{cases} \mathbb{R}[X] & \longrightarrow & \mathbb{R}[X] \\ P & \longmapsto & P'' \end{cases}$

d. $i : \begin{cases} \mathbb{R} & \longrightarrow & \mathbb{R} \\ x & \longmapsto & 3x \end{cases}$

e. Aucune des autres réponses

Question 15

On considère l'application linéaire $f : \begin{cases} \mathbb{R}^3 & \longrightarrow & \mathbb{R}^3 \\ (x,y,z) & \longmapsto & (x+y,\ y+z,\ x+z) \end{cases}$

On a

a. $\text{Ker}(f) = \mathbb{R}^3$

b. $\text{Ker}(f) = \{(x,y,z) \in \mathbb{R}^3,\ x = y = -z\}$

c. $\text{Ker}(f) = \{0_{\mathbb{R}^3}\}$

d. Aucune des autres réponses

Question 16

Soit f un endomorphisme de $\mathbb{R}^2$ tel que $f((1,0)) = (2,3)$ et $f((1,-1)) = (4,5)$. Ces informations

a. nous permettent de trouver l'image de n'importe quel vecteur $(x,y) \in \mathbb{R}^2$

b. ne nous permettent pas de trouver l'image de n'importe quel vecteur $(x,y) \in \mathbb{R}^2$

Question 17

Soient E et F deux $\mathbb{R}$-espaces vectoriels et $f \in \mathscr{L}(E,F)$. On a

a. $\text{Im}(f) = \{u \in E,\ \exists v \in F, v = f(u)\}$

b. $\text{Im}(f) = \{v \in F,\ \exists u \in E, u = f(v)\}$

c. $\text{Im}(f) = \{v \in F,\ \exists u \in E, v = f(u)\}$

d. Aucune des autres réponses

Question 18

On considère l'application linéaire $f : \begin{cases} \mathbb{R}^2 & \longrightarrow & \mathbb{R}^2 \\ (x,y) & \longmapsto & (y,-2x) \end{cases}$

Alors, f est bijective

a. Vrai

b. Faux

Question 19

Dans $\mathbb{R}^3$, on considère les vecteurs $u = (1,0,1)$, $v = (0,-1,1)$ et $w = (1,-1,2)$.

a. La famille (u,v) est libre.

b. La famille (u,v) est liée.

c. La famille (u,v,w) est libre.

d. La famille (u,v,w) est liée.

Question 20

Soit l'application linéaire $f : \begin{cases} \mathbb{R}^3 & \longrightarrow & \mathbb{R}^2 \\ (x,y,z) & \longmapsto & (x,z) \end{cases}$

Le noyau de f est :

a. $\text{Ker}(f) = \{(0,0,0)\}$

b. $\text{Ker}(f) = \{(0,0)\}$

c. $\text{Ker}(f) = \{(x,y,z) \in \mathbb{R}^3,\ x = z = 0\}$

d. Aucune des autres réponses

CIE S2 MCQ 7

27/3/23

Grammar

21. Choose the CORRECT sentence.

a) They will be take by the neighbours.
b) They have been eaten by the birds.
c) They are using in a cheesecake.
d) They had grow in the summer.

22. Choose the CORRECT sentence.

a) English has always spoke in the UK.
b) English was speaking in many countries.
c) English is spoken throughout the world.
d) English speaks everywhere.

23. Choose the CORRECT sentence.

a) The film was generating by the director.
b) The video was created by a YouTuber.
c) The film is going to make every week.
d) The video was been made by English speakers.

24. Choose the INCORRECT sentence.

a) The washing machine had been switched off.
b) The key was been forgotten in the door.
c) The lights were left on.
d) The fridge is being emptied.

25. Choose the INCORRECT sentence.

a) My computer was crashed.
b) The computers are reserved for our project.
c) I've been hacked.
d) Licences will be required for the software.

Article 8 : 'There are Too Few Women in Computer Science and Engineering'

26) *"A common explanation is that women are less interested than men in computer science and engineering"* --- what is the opinion of the authors about this statement?

a) They disagree wholeheartedly.
b) They say it's technically inaccurate and only makes the situation worse.
c) They say it's technically accurate, but incomplete in problematic ways.
d) They agree with women's and men's own responses.

27) Which of the following theories are identified in the text that explain the presence of fewer women in IT and engineering ?

a) Girls are simply not as interested in these fields. /The image of these fields is overly male orientated.
b) Girls are simply not as interested in these fields. / Boys are statistically more drawn to IT.
c) The salaries of these fields are not competitive./ Too many girls are dissuaded from choosing IT.
d) The image of these fields is overly male-oriented./ It all has to do with human biology.

28) According to the authors, which of the following issues is the real problem behind the answers of Q27 ?

a) Girls are simply not as interested in these fields.
b) The image of these fields is overly male orientated.
c) Boys are statistically more drawn to IT.
d) Too many girls are dissuaded from choosing IT.

29) Which two countries are cited as examples of having "less male-oriented images of computer science" ?

a) Armenia and Malaysia
b) Indonesia and Malaysia
c) Japan and Singapore
d) Armenia and Japan

30) Which of the following is described as '*masculine defaults*' in the article ?

a) The negative sides of men's working habits.
b) The absence of men's enthusiasm in promoting women.
c) That men are generally socially awkward.
d) The features that reward the characteristics that are commonly associated with being male.

Big Tech wants its workers back in the office.

1. The San Francisco exodus is over already. According to data from the US Postal Service, the number of people moving out of the Bay Area is back to pre-pandemic levels. Big Tech wants its workers back where it can see them.

2. In the midst of a truly disruptive global trend, the world's greatest disrupters are clinging on to tradition. Companies like Google may have delayed office reopenings but they have not given up completely. This conservatism contrasts with radical changes elsewhere in the sector. In May, cryptocurrency exchange Coinbase declared that it would close its San Francisco headquarters for good. In-person gatherings would be arranged for collaboration but day-to-day work would be remote. "If we had let our office-based inertia carry us into the future of work, we'd still be where we were almost a year ago," wrote Dominique Baillet, head of employee experience.

3. Tech workers, like a lot of employees, do not want to go back to the office full time. Being evaluated on work rather than presenteeism is popular. So is avoiding time-consuming commutes and noisy open plan offices. In a survey of tech workers by job site Indeed, 95 per cent of people with the option to work from home permanently said they intended to take it.

4. Websites like Build Remote are now tracking the companies that offer the option to work from anywhere. Q&A site Quora and cloud computer company Snowflake both joined the list this year. Twitter, Pinterest and Dropbox are among those that have moved to a "remote first" policy in which offices are available but remote work is supported.

5. Why then are so many of the world's biggest tech bosses stuck on the idea that in-person work is better? Netflix boss Reed Hastings simply claims he sees no positives in remote working. Alphabet and Google chief executive Sundar Pichai says that seeing workers in offices fills him with "optimism". Apple's Tim Cook wrote that there was "something essential missing from this past year: each other", according to a memo seen by The Verge.

6. This, of course, is not true. Thanks to the tools that tech companies themselves created, those of us whose job involves sitting in front of a computer have remained in constant contact throughout the pandemic.

7. Bosses who claim they want employees in offices because they like them risk sounding insincere. But declaring that the company has sunk millions into purpose built campus buildings and is concerned about managing a very large workforce at a distance would probably not make it past the internal comms team.

8. The problem with demanding that employees return to offices is how successful the involuntary remote work trial has been. It is hard to overstate the positive shock that working remotely works, declared Silicon Valley entrepreneur Marc Andreessen in an interview this summer. If it is feasible during a pandemic, it should work even better afterwards.

9. Andreessen, one half of the influential venture capital firm Andreessen Horowitz, is known for his evangelical belief in tech's ability to improve the world. But he is right that remote work has not derailed employee productivity or company profits. Big tech companies have acknowledged this by accepting that full time office hours are not necessary. Some have even embraced it. Facebook will allow employees to request permanent remote work.

10. Others, however, still frame remote work as an employee perk. The hybrid arrangements they favour require workers to spend the majority of their working life in an office, meaning they cannot move away from expensive cities and must continue to spend hours commuting. In June, Apple told workers they would be expected to go back to the office for at least three days each week to "optimise our time for in-person collaboration". Amazon has a "baseline" of three days a week in the office. Microsoft wants employees back half the time. Uber wants office-based employees to spend at least 50 per cent of their time there.

11. Perhaps this is where smaller companies will get the chance to shine. Remote work cuts costs but it could also win over new hires. Competition is fierce. Offering employees the chance to choose where they work is one way to gain an edge over larger, wealthier companies.

12. Tech industry titans led the world in closing offices in the earliest days of the pandemic. They became immensely rich selling services that facilitated working from home arrangements. Their rejection of fully remote work is a strange conclusion to an extraordinary 18 months.

31. According to data from the US Postal Service the number of people moving out of the bay area is...
    a. higher than during the pandemic
    b. the same as before the pandemic
    c. lower than before the pandemic
    d. twice as much than during the pandemic

32. Which word is closest in meaning to "clinging" in paragraph 2?
    a. losing
    b. bringing
    c. continuing
    d. holding

33. What does cryptocurrency exchange Coinbase plan to do?
    a. Allow employees to continue working from home.
    b. Open the office three days per week.
    c. Have daily meetings in the office but work from home in the afternoon.
    d. Open new headquarters elsewhere

34. What are some of the perks of working from home?
    a. Being evaluated on work and presenteeism.
    b. Becoming more autonomous and less distracted.
    c. Avoiding commutes and noisy open plan offices.
    d. Being able to watch films during work hours.

35. According to job site Indeed...
    a. not many people would like to work from home if allowed.
    b. the majority of people would like to work from home if allowed.
    c. less than half of those asked would like to work from home if allowed.
    d. three quarters of people would like to work from home if allowed.

36. Why is it difficult to justify returning to the office, according to Marc Andreessen?
    a. Working from home is less expensive for companies.
    b. Working from home actually brings people together.
    c. Working from home works surprisingly well.
    d. Working from home is nicer than working in the office.

37. Which word(s) is closest in meaning to "request" in paragraph 9?
    a. demand
    b. beg for
    c. ask for
    d. expect

38. What do hybrid arrangements entail?
    a. Employees cannot ~~more~~ move away from costly cities.
    b. Employees must have many online meetings.
    c. Employees cannot have other appointments during work hours.
    d. Employees will be more productive at the office.

ANNULEE

39. How could Big Tech's rejection of fully remote work be advantageous for smaller companies?
    a. Smaller companies could develop new innovative software.
    b. Smaller companies may be able to attract more employees.
    c. Smaller companies could avoid fierce competition.
    d. Smaller companies may need to increase costs.

40. Would you say the tone of the article concerning Big Tech's position on remote work is...
    a. complimentary.
    b. aggressive.
    c. optimistic.
    d. surprised.

QCM Physique/Electronique – InfoS2

Pensez à bien lire les questions ET les réponses proposées

Q41. La grandeur quantité de mouvement peut s'exprimer en :

a. $m.v$
b. $kg.m.s^{-1}$
c. $kg.s.m^{-1}$
d. $kg.m.s^{-2}$

Q42. L'énergie cinétique peut s'exprimer en :

a. $kg.m.s^{-2}$
b. $kg.m^2.s^2$
c. $kg.m^2.s^{-2}$
d. $kg.m^2.s$

Q43. Le théorème de l'énergie cinétique entre les instants t_1 et t_2, où l'objet occupe respectivement les points A et B, peut s'écrire :

a. $\Delta E_c = \sum W_{A\to B}(\vec{F})$
b. $\Delta E_c = \sum W_{B\to A}(\vec{F})$
c. $E_c = \sum W_{B\to A}(\vec{F})$
d. $E_c = \sum W_{A\to B}(\vec{F})$

Q44. Si la somme des travaux des forces est positive alors :

a. L'énergie cinétique augmente
b. L'énergie cinétique diminue
c. L'énergie cinétique ne varie pas
d. On ne peut pas affirmer une des réponses précédentes

Q45. Dans le cas d'un objet de masse $m = 10kg$ qui tombe sans frottement d'une hauteur de $10\ m$ avec une vitesse initiale nulle, on peut dire que l'énergie cinétique de l'objet au moment où il touche le sol vaut : $(g = 10\ N/kg)$

a. $E_c = 1000J$
b. $E_c = 2000\ J$
c. $E_c = 981\ J$
d. $E_c = 100J$

Soit un courant sinusoïdal $i(t) = I.\sqrt{2}.sin\,(\omega t + \varphi)$. On note $\underline{I}$, l'amplitude complexe de $i(t)$.

Q46. Quel est le module de $\underline{I}$?

a. φ
b. I
c. $\frac{I}{\sqrt{2}}$
d. ω

Q47. Quel est l'argument de $\underline{I}$?

a. φ
b. $I.\sqrt{2}$
c. ω
d. I

Q48. Quelle formule représente l'impédance complexe d'un condensateur de capacité C?

a. $jC\omega$
b. $\frac{1}{jC\omega}$
c. $\frac{1}{C}$
d. Aucune de ces réponses

Q49. Quelle formule représente l'impédance complexe d'une bobine d'inductance L?

a. $jL\omega$
b. $\frac{1}{jL\omega}$
c. L
d. $\frac{-j}{L\omega}$

Q50. Soit un dipôle D. On note $\underline{Z}$, son impédance complexe. Quelle est l'unité de $|\underline{Z}|$?

a. Des Volt (V)
b. Des Ohm (Ω)
c. Il n'y en a pas
d. Ça dépend du dipôle

QCM 7
Architecture des ordinateurs

Lundi 27 mars 2023

Pour toutes les questions, une ou plusieurs réponses sont possibles.

51. Pour réaliser un compteur asynchrone modulo *m* sur *n* bits à cycle incomplet (avec $n > 2$), on doit :
   - X A. Détecter $2^n - 1$.
   - B. Détecter 0.
   - C. Détecter $m - 1$.
   - D. Détecter *m*.

52. Choisir la réponse correcte.
   Un compteur comportant *n* bascules :
   - A. ne peut pas compter de 0 à $2^n - 1$.
   - B. peut compter de 0 à $2^n - 1$.
   - C. peut compter de 0 à 2^n.
   - D. compte toujours de 0 à $2^n - 1$.

53. Choisir la réponse correcte :
   - A. Un compteur asynchrone est une association de bascules en série.
   - B. Dans un compteur asynchrone, les bascules ont la même horloge.
   - C. Un compteur synchrone est une association de bascules en série.
   - D. Dans un compteur synchrone, les bascules n'ont pas la même horloge.

54. Pour réaliser un décompteur asynchrone modulo *m* sur *n* bits à cycle incomplet (avec $n > 2$), on doit :
   - A. Détecter $m - 1$.
   - B. Détecter *m*.
   - C. Détecter 0.
   - D. Détecter $2^n - 1$.

55. Pour réaliser un décompteur asynchrone modulo *m* sur *n* bits à cycle incomplet (avec $n > 2$), on doit :
   - A. Forcer $2^n - 1$.
   - B. Forcer *m*.
   - C. Forcer 0.
   - D. Forcer $m - 1$.

56. Pour concevoir un compteur asynchrone, on peut utiliser :
   - A. Des bascules D synchronisées sur les fronts descendants.
   - B. Des bascules JK synchronisées sur les fronts montants.
   - C. Des bascules RS asynchrones.
   - D. Des bascules JK synchronisées sur les fronts descendants.

57. Un compteur comportant n bascules (avec n > 1) est à cycle incomplet si :
   - A. il compte de 0 à 2^n.
   - B. il compte de 0 à $2^n - 1$.
   - C. il compte de 0 à une valeur inférieure à $2^n - 1$.
   - D. il compte de 0 à une valeur inférieure à 2^n.

58. Combien de bascules sont nécessaires pour fabriquer un compteur modulo 2^n (avec n > 1) ?
   - A. n bascules.
   - B. n – 1 bascules.
   - C. n + 1 bascules.
   - D. 2^n bascules.

59. Combien de bascules sont nécessaires pour fabriquer un compteur modulo $2^n - 1$ (avec n > 1) ?
   - A. n bascules.
   - B. n – 1 bascules.
   - C. n + 1 bascules.
   - D. $2^n - 1$ bascules.

60. Combien de bascules sont nécessaires pour fabriquer un compteur modulo $2^n - 2$ (avec n > 2) ?
   - A. n bascules.
   - B. n – 1 bascules.
   - C. n + 1 bascules.
   - D. $2^n - 1$ bascules.

13/13