ALGO
QCM

1. **Pour la déclaration**

```
TYPES   way
UTILISE is, the
```

   l'opération this : is x the -> way est ?

   (a) Un observateur

   ✓ (b) Une opération interne

   (c) Un rapporteur

   (d) Une opération externe

   (e) Un observeur

2. **La définition d'une opération est composée ?**

   ✓ (a) d'un nom

   ✓ (b) d'un profil

   (c) d'un surnom

   (d) d'un préfixe

   (e) d'un suffixe

3. **La zone UTILISE sert à préciser ?**

   (a) Les types définis

   ✓ (b) Les types prédéfinis

4. **Les TYPES servent à préciser ?**

   ✓ (a) Les types définis

   (b) Les types prédéfinis

5. **Un observateur ?**

   ✓ (a) possède au moins un argument défini

   (b) possède au moins un argument prédéfini

   (c) retourne un résultat de type défini

   ✓ (d) retourne un résultat de type prédéfini

6. **Pour la déclaration**

```
TYPES   infinity, and
UTILISE beyond
```

   l'opération to : infinity x and -> beyond est ?

   ✓ (a) Un observateur

   (b) Une opération interne

   (c) Un rapporteur

   (d) Une opération externe

   (e) Un observeur

7. **Quelles opérations définissent un vecteur ?**
   (a) entier
   (b) longueur
   ✓ (c) vect
   ✓ (d) changer-ième

8. **Une constante est une fonction qui ?**
   (a) possède au moins un argument défini
   (b) possède au moins un argument prédéfini
   ✓ (c) ne possède aucun argument
   (d) ne retourne rien

9. **Pour la déclaration**

   ```
   TYPES    Kenny
   UTILISE they, killed
   ```

   l'opération `Omg : they x killed -> Kenny` **est ?**
   (a) Un observateur
   ✓ (b) Une opération interne
   (c) Un rapporteur
   (d) Une opération externe
   (e) Un observeur

10. **Une opération interne ?**
    (a) possède au moins un argument défini
    (b) possède au moins un argument prédéfini
    ✓ (c) retourne un résultat de type défini
    (d) retourne un résultat de type prédéfini

QCM 1

lundi 2 octobre

Question 11

On considère deux ensembles finis quelconques A et B. On a

    a. $\text{Card}(A \cap B) = \text{Card}(A) \times \text{Card}(B)$.

    b. $\text{Card}(A \cap B) = \text{Card}(A) + \text{Card}(B)$

✓   c. $\text{Card}(A \cap B) = \text{Card}(A) + \text{Card}(B) - \text{Card}(A \cup B)$

    d. $\text{Card}(A \cap B) = \text{Card}(A \cup B) - \text{Card}(A) - \text{Card}(B)$

    e. Aucune des autres réponses

Question 12

On considère l'ensemble $E = \{0, 1, 2, 3, 4\}$. Un 3-uplet de E est un élément de E^3 donc de la forme (a, b, c) avec a, b et c dans E. On a

✓   a. Le nombre de 3-uplets de E constitués d'éléments distincts est égal à $3 \times 4 \times 5$.

    b. Le nombre de 3-uplets de E constitués d'éléments distincts est égal à 5^3.

    c. Le nombre de 3-uplets de E constitués d'éléments quelconques est égal à $3 \times 4 \times 5$.

✓   d. Le nombre de 3-uplets de E constitués d'éléments quelconques est égal à 5^3.

    e. Aucune des autres réponses

Question 13

Cochez la(les) bonne(s) réponse(s)

    a. Le nombre d'anagrammes du mot « MATH » est égal à 4

✓   b. Le nombre d'anagrammes du mot « MATH » est égal à 4!

    c. Le nombre d'anagrammes du mot « ASSEZ » est égal à 5

    d. Le nombre d'anagrammes du mot « ASSEZ » est égal à 5!

    e. Aucune des autres réponses

Question 14

Une urne contient 5 boules numérotées de 1 à 5. On tire 3 boules simultanément. Le nombre de tirages est égal à

    a. $3 \times 4 \times 5$

    b. 5^3

    c. 3^5

✓   d. 10

    e. Aucune des autres réponses

Question 15

Cochez la(les) réponse(s) correcte(s) :

    a. $5! - 3! = 2!$

✓   b. $8! = 6! \times 7 \times 8$

✓   c. $\dfrac{15!}{13! \times 2!} = 7 \times 15$

    d. $\dfrac{15!}{13! \times 2!} = 13 \times 7 \times 15$

    e. Aucune des autres réponses

Question 16

Soit E un ensemble de cardinal 7. Le nombre de sous-ensembles de E ayant 4 éléments (distincts) est égal à

    a. 4^7

    b. $4 \times 5 \times 6 \times 7$

✓   c. $\dbinom{7}{4}$

    d. 2^7

    e. Aucune des autres réponses

Question 17

Soient $n \in \mathbb{N}$ et $k \in [\![0, n]\!]$. On a

    a. $\dbinom{n}{k} = \dfrac{n!}{k!}$

    b. $\dbinom{n}{k} = \dfrac{n!}{(n - k)!}$

    c. $\dbinom{n}{k} = \dfrac{k!}{n!}$

    d. $\dbinom{n}{k} = \dfrac{k!}{(k - n)!}$

✓   e. Aucune des autres réponses

Question 18

Soit $n \in \mathbb{N}$. On a

    a. $\dbinom{n}{n} = n$

✓   b. $\dbinom{n}{n} = 1$

✓   c. $\dbinom{n}{1} = n$

    d. $\dbinom{n}{1} = 1$

    e. Aucune des autres réponses

Question 19

Soient $n \in \mathbb{N}$ et deux réels x et y. On a $(x + y)^n = \displaystyle\sum_{k=0}^{n} \binom{n}{k} x^k y^k$

    a. Vrai

✓   b. Faux

Question 20

Dans une classe, il y a 40 élèves. Il faut élire un délégué et deux suppléants (il doit s'agir de trois personnes distinctes). Le nombre de choix possibles est $40 \times \dbinom{39}{2}$.

✓   a. Vrai

    b. Faux

QCM Electronique – InfoS1

Pensez à bien lire les questions ET les réponses proposées (attention à la numérotation des réponses)

Q21. Qu'est-ce qu'un courant électrique ?

B

- a- Une différence de potentiels
- b- Un déplacement ordonné de charges électriques
- c- Un déplacement de charges électriques
- d- Une dissipation de chaleur

Q22. La résistance d'un dipôle est :

- a- Sa force
- ✓ b- Sa capacité à s'opposer au passage du courant
- c- Sa durabilité

Q23. Quelle est l'unité de la résistance électrique ?

C

- a- Des Volt (V)
- b- Des Ampères (A)
- c- Des Ohms (Ω)
- d- Des Watts (W)

Q24. Quelle loi utiliser pour écrire une relation entre les tensions ?

B
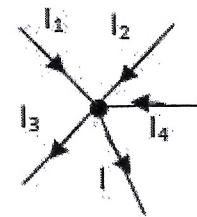
- a- La loi des nœuds
- b- La loi des mailles

Q25. Dans le schéma ci-contre, on a les courants suivants :

$$I_1 = 5mA \; ; \; I_2 = 1mA; \; I_3 = -1mA; \; I_4 = -3mA$$
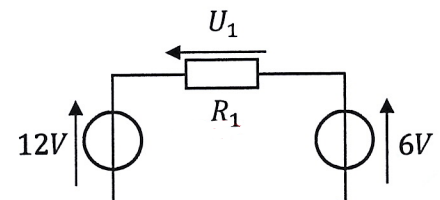
Calculer le courant I.

A

- a- $I = 4\,mA$
- b- $I = 2\,mA$
- c- $I = 10\,mA$
- d- $I = 8\,mA$

Q26. On considère le circuit ci-contre : Que vaut la tension U_1 ?

C

- a. $-18V$
- b. $-6V$
- c. $6V$
- d. $18V$

Soit le circuit ci-contre (Q27 à 30)

Q27. Les 3 résistances R_1, R_2 et R_3 sont :

    a- En série

    b- En parallèle (dérivation)

Q28. Que vaut l'intensité du courant I ?

    a- $1A$

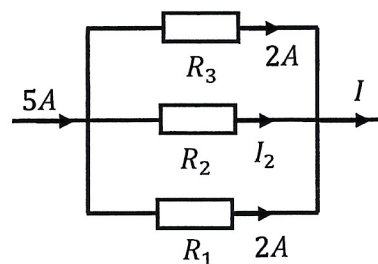   b- $5A$

    c- $2A$

    d- On ne peut pas savoir

Q29. Que vaut l'intensité du courant I_2 ?

    a- $1A$ c- $2A$

    b- $5A$ d- On ne peut pas savoir

Q30. Que peut-on dire de R_1 et R_3 ?

    a- $R_1 < R_3$ c- $R_1 > R_3$

    b- $R_1 = R_3$ d- On ne peut rien dire

QCM 1
Architecture des ordinateurs

Lundi 2 octobre 2023

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

31. Quel nombre est égal à 2^{18} ?
    - ✓ A. 262144
    - B. 131072
    - ✓ C. $2^{19} - 2^{18}$
    - D. Aucune de ces réponses.

32. Quel nombre est égal à 2^{-8} ?
    - A. 0,0078125
    - B. 0,00391625
    - C. 0,001953125
    - ✓ D. Aucune de ces réponses.

33. Quel est le poids du chiffre C dans le nombre suivant : $ABCD_{16}$?
    - A. 1
    - B. 12
    - ✓ C. 16
    - D. Aucune de ces réponses.

34. Quel est le résultat de la soustraction suivante : $1000_{16} - 1_{16}$?
    - A. 999_{16}
    - ✓ B. FFF_{16}
    - C. $1FFF_{16}$
    - D. Aucune de ces réponses.

35. Quel est le résultat de l'addition suivante : $299_{16} + 1_{16}$?
    - A. $30A_{16}$
    - B. 300_{16}
    - ✓ C. $29A_{16}$
    - D. Aucune de ces réponses.

36. $239_{10} =$
    - A. 11101101_2
    - B. DF_{16}
    - ✓ C. 11101111_2
    - D. Aucune de ces réponses.

37. $CAB_{16} =$
    - A. 110010111011_2
    - B. 3244_{10}
    - C. 101110101100_2
    - ✓ D. Aucune de ces réponses.

38. $3201_{10} =$
    - A. $C80_{16}$
    - ✓ B. $C81_{16}$
    - C. $C82_{16}$
    - ✓ D. Aucune de ces réponses.

39. $AC7F_{16} =$
    - ✓ A. 1010110001111111_2
    - ✓ B. 44159_{10}
    - ✓ C. $AC80_{16} - 1_{16}$
    - D. Aucune de ces réponses.

40. $20000_{16} =$
    - ✓ A. 2^{17}
    - B. 2^{18}
    - ✓ C. $2^{18} - 2^{17}$
    - D. Aucune de ces réponses.

Deadly Mistakes (Q.41-45): Choose the correct answers:

41.Children depend ___ their parents for guidance.

    a. from
✓   b. on
    c. of
    d. nothing – leave it blank

42.The United States ___ a lot for the environment.

✓   a. has not always done
    b. have not always done
    c. does not always did
    d. have not always did

43.Today almost ___ interested in new technology.

    a. every people is
    b. everybody are
✓   c. everyone is
    d. everyone are

44.I tried to get ___ but the Internet wasn't working on my phone.

    a. all the informations
    b. all informations
    c. many information
✓   d. all the information

45._____ days of the week do you have English classes?

    a. wich
    b. witch
✓   c. which
    d. None of the above are correct.

Reading comprehension (Q.46-50): Read the following passage and answer the questions:

[1] Charles Darwin's Theory of Evolution is known as one of the most important and controversial scientific theories ever published. Darwin was an English scientist in the 19th century best known for his book "On the Origin of Species." In his book, Darwin postulated different species shared characteristics of common ancestors, that they branched off from common ancestors as they evolved, and that new traits and characteristics were a result of natural selection. The theory is based on the assumptions that life developed from non-life and progressed and evolved in an indirect manner. Therefore, the Theory of Evolution, while controversial, has shaped and influenced the modern scientific world's thinking on the development of life itself. Darwin was born February 12, 1809, in England. Although initially entering into medicine, Darwin chose to pursue his interest in natural science and embarked on a five-year journey aboard the H.M.S. Beagle, a British sloop belonging to the Royal Navy. Because of his experience aboard the Beagle, he laid the foundation for his Theory of Evolution while also establishing himself within the scientific community. Specifically, Darwin's keen observation of the fossils and wildlife he saw during his time on the Beagle served as the basis for the cornerstone of his theory: natural selection.

[2] Natural selection contributes to the basis of Darwin's Theory of Evolution. One of the core tenets of Darwin's theory is that more offspring are always produced for a species than can possibly survive. Yet, no two offspring are perfectly alike. As a result, through random mutation and genetic drift, over time offspring develop new traits and characteristics. Over time beneficial traits and characteristics that promote survival will be kept in the gene pool while **those** that harm survival will be selected against. Therefore, this natural selection ensures that a species gradually improves itself over an extended duration of time. On the other hand, as a species continues to 'improve' itself, it branches out to create entirely new species that are no longer capable of reproducing together.

[3] Through natural selection, organisms could branch off from each other and evolve to the point where they no longer belong to the same species. Consequently, simple organisms evolve into more complex and different organisms as species break away from one another. Natural selection parallels selective breeding employed by humans on domesticated animals for centuries. Namely, horse breeders will ensure that horses with particular characteristics, such as speed and endurance, are allowed to produce offspring while horses that do not share those above-average traits will not. Therefore, over several generations, the new offspring will already be pre-disposed towards being excellent racing horses.

[4] Darwin's theory is that 'selective breeding' occurs in nature as 'natural selection' is the engine behind evolution. Thus, the theory provides an excellent basis for understanding how organisms change over time. Nevertheless, it is just a theory and elusively difficult to prove. One of the major holes in Darwin's theory revolves around "irreducibly complex systems." An irreducibly complex system is known as a system where many different parts must all operate together. As a result, in the absence of one, the system as a whole collapses. Consequently, as modern technology improves, science can identify these "irreducibly complex systems" even at microscopic levels. These complex systems, if so inter-reliant, would be resistant to Darwin's supposition of how evolution occurs. As Darwin himself admitted, "To

suppose that the eye with all its inimitable contrivance for adjusting the focus for different distances, for admitting different amounts of light, and for the correction of spherical and chromatic aberration, could have been formed by natural selection, seems, I free confess, absurd in the highest degree".

[5] In conclusion, "On the Origin of Species" is known as one of the most consequential books ever published. Darwin's Theory of Evolution remains, to this day, a lightning rod for controversy. The theory can be observed repeatedly, but never proven, and there is a **plethora** of instances that cast doubt on the processes of natural selection and evolution. Darwin's conclusions were a result of keen observation and training as a naturalist. Despite the controversy that swirls around his theory, Darwin remains one of the most influential scientists and naturalists ever born due to his Theory of Evolution.

46.Which sentence is most similar to the following sentence from paragraph 1?

The theory is based on the assumptions that life developed from non-life and progressed and evolved in an indirect manner.

a. The Theory of Evolution is founded on evidence that non-organic compounds are the basis of life, developed in an unguided way.
b. Based on certain assumptions, we can prove that evolution occurs in all living and non-living entities.
c. According to Darwin, if we assume that life at its origin was created from non-organic compounds and developed in an unguided manner, his theory holds true.
d. Due to the controversy, it is hard to make assumptions about The Theory of Evolution.

47.The word 'those' in paragraph 2 refers to _____.

a. gene pool

b. survival

c. natural selection

d. traits and characteristics

48.According to paragraph 3, what is natural selection most comparable to as a process?

a. branching trees

b. selective breeding

c. irreducibly complex systems

d. the human eye

49.All of the following are mentioned in paragraph 4 as a viewpoint to state that natural selection is difficult to prove EXCEPT

a. the belief that the complexity of the human eye could have been formed by natural selection seems highly unlikely.

b. the presence of irreducibly complex systems contradict how evolution occurs.

c. modern technology has been used to prove that irreducibly complex systems exist.

✓ d. selective breeding is the major hole in the theory of natural selection.

50.The word 'plethora' in paragraph 5 is closest in meaning to _____.

✓ a. large

b. sufficient

c. essential

d. prominent

Use the one-word formal verbs listed below to replace the informal phrasal verbs used in the sentences below.

51) It is necessary to ***add in*** the new information.
   a) return
   b) investigate
   c) repeat
   ✓ d) include

52) Inflation ***has gone up*** recently.
   a) devised
   b) decreased
   ✓ c) increased
   d) returned

53) The team ***came up with*** a good strategy.
   ✓ a) devised
   b) identified
   c) returned
   d) investigated

54) They ***turned up*** late.
   ✓ a) arrived
   b) showed
   c) resumed
   d) returned

Identify the error in each of the following sentences:

55) For make its nest, the yellow-headed blackbird weaves a small cup and fastens it to reeds above water.
   ✓ a) for make
   b) its
   c) weaves
   d) above

56) Native American beaded designs are often characterized by geometric shaped and bright colors.
   a) beaded
   b) characterized
   ✓ c) shaped
   d) bright

57) The codfish lays million of eggs each year, only a small percentage of which actually hatch.
   a) lays
   ✓ b) million
   c) only
   d) of which

58) When the body becomes extremely overheated, it failure to cool itself again, and sunstroke can occur.
   a) extremely
   ✓ b) failure
   c) itself
   d) can occur

59) The preferring of many Western cultures for maintaining a physical distance of at least three feet during social interaction is well documented in anthropological studies.
   ✓ a) preferring
   b) many
   c) maintaining
   d) at least

60) In chronicling her months as a captive of the Wampanoag Indians, Mary Rowlandson demonstrated his narrative skill.
   a) in chronicling
   b) as
   c) demonstrated
   ✓ d) his