

0 = correct answer

ALGO
MCQ

1. In the hashing principle, the position of an element is determined by?

- (a) its own value
- (b) the value of its key
- (c) a function applied to its value
- (d) a function applied to its key

2. A hashing function cannot be ?

- (a) Consistent
- (b) Universal
- (c) Easy to compute
- (d) Fast to compute

3. Among the following methods, which ones are basic methods ?

- (a) separation
- (b) exception
- (c) diagonalization
- (d) convolution
- (e) none of the above

4. Which basic hashing method uses a real number lying between 0 and 1 ?

- (a) the completion
- (b) the division
- (c) the multiplication
- (d) la separation

5. Is the separation a hashing method ?

- (a) Yes
- (b) No
- (c) Sometimes

6. The basic hashing method that uses bit operators on sub-words is ?

- (a) the completion
- (b) the compression
- (c) the extraction
- (d) the division

7. A hashing function must be ?

- (a) Consistent
- (b) Universal
- (c) Easy to compute
- (d) Fast to compute

8. The extraction, a basic hashing method, using certain bits of the representation ?

- (a) gives excellent results
- (b) gives correct results
- (c) does not give good results

9. Let x and y be two distinct elements such as $v = h(x) = h(y)$, we say that we have a?

- (a) Collision between x and y at the slot v
- (b) Primary collision between x and y at the slot v
- (c) Secondary collision between x and y at the slot v
- (d) Single collision between x and y at the slot v

10. The major drawback of the compression method is to hash ?

- (a) systematically odd size words
- (b) identically permutations of the same word
- (c) systematically even size words
- (d) identically odd size words



MCQ N°1

Monday, 30 September 2019

Question 11

When x tends to 0, one has

- a. $\cos(x) = 1 - \frac{x^2}{2} + \frac{x^4}{4} + o(x^4)$
- b. $\cos(x) = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} + o(x^4)$
- c. $\cos(x) = x - \frac{x^3}{3} + \frac{x^5}{5} + o(x^5)$
- d. $\cos(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} + o(x^5)$
- e. none of the above

Question 12

When x tends to 0, one has

- a. $\ln(1+x) = 1+x - \frac{x^2}{2!} + \frac{x^3}{3!} + o(x^3)$
- b. $\ln(1+x) = 1+x - \frac{x^2}{2} + \frac{x^3}{3} + o(x^3)$
- c. $\ln(1+x) = 1+x + \frac{x^2}{2} + \frac{x^3}{3} + o(x^3)$
- d. $\ln(1+x) = 1+x + \frac{x^2}{2!} + \frac{x^3}{3!} + o(x^3)$
- e. none of the above

Question 13

When x tends to 0, one has

- a. $\sqrt{1+x^2} = 1 + \frac{1}{2}x^2 + o(x^2)$
- b. $\sqrt{1+x^2} = 1 + \frac{1}{4}x^2 + o(x^2)$
- c. $\sqrt{1+x^2} = 1 + \frac{1}{4}x^4 + o(x^4)$
- d. $\sqrt{1+x^2} = 1 + \frac{1}{2}x^2 + o(x^3)$
- e. none of the above

Question 14

When x tends to 0, one has

a. $\sin(x) = 1 - \frac{x^2}{2} + \frac{x^4}{4} + o(x^4)$

b. $\sin(x) = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} + o(x^4)$

c. $\sin(x) = x - \frac{x^3}{3} + \frac{x^5}{5} + o(x^5)$

☒ d. $\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} + o(x^5)$

e. none of the above

Question 15

When x tends to 0, one has

☐ a. $\frac{1}{1+x} = 1 + x + x^2 + x^3 + o(x^3)$

☒ b. $\frac{1}{1+x} = 1 - x + x^2 - x^3 + o(x^3)$

☒ c. $\frac{1}{1-x} = 1 + x + x^2 + x^3 + o(x^3)$

☐ d. $\frac{1}{1-x} = 1 - x + x^2 - x^3 + o(x^3)$

e. none of the above

Question 16

When x tends to 0, one has

☒ a. $e^{1+2x} = 2 + 2x + o(x)$

☒ b. $e^{1+2x} = \frac{5}{2} + 4x + 2x^2 + o(x^2)$

c. $e^{1+2x} = e(1 + 2x + 4x^2) + o(x^2)$

d. $e^{1+2x} = 2 + 4x + 2x^2 + o(x^2)$

☒ e. none of the above

Question 17

The series $\sum \frac{1}{e^n}$ is

a. a Riemann series

☒ b. a geometric series

☒ c. a convergent series

d. a divergent series

Question 18

Let $\alpha \in \mathbb{R}$. The series $\sum \frac{1}{n^\alpha}$ converges if and only if

- a. $\alpha > 0$
- b. $\alpha < 0$
- c. $0 < \alpha < 1$
- ☒ d. $\alpha > 1$
- e. $\alpha < 1$

Question 19

Let (u_n) be a numerical sequence. Then

- a. if (u_n) converges to 0, then $\sum u_n$ converges
- ☒ b. if $\sum u_n$ converges, then (u_n) converges to 0
- ☒ c. if (u_n) converges to 1, then $\sum u_n$ diverges
- d. if $\sum u_n$ diverges, then (u_n) diverges
- e. none of the above

contrapositive

Question 20

Let (u_n) be a positive numerical sequence. Then $\sum u_n$ converges iff the sequence $\left(\sum_{k=0}^n u_k\right)$ is bounded above.

- ☒ a. true
- b. false

21. What do you do every day before you come to class?
- a. I have eaten breakfast.
 - b. I am eating breakfast.
 - ☒ c. I eat breakfast.
 - d. I've taken the bus.
22. Ask Ahmed for your book. He ____ it.
- a. would have
 - ☒ b. has
 - c. can have
 - d. is having
23. By the time the meeting ____ over, you'll know everything about our marketing plan.
- a. will be
 - b. was
 - ☒ c. is
 - d. be
24. What ____ at?
- a. do you look
 - b. you are looking
 - ☒ c. are you looking
 - d. you look
25. How many questions has the teacher asked since she began this exercise?
- ☒ a. I think she has asked 5 questions since we began this exercise.
 - b. I think she asked 5 questions since we began this exercise.
 - c. I think I was asked 5 questions since we began this exercise.
 - d. I think she had asked 5 questions since we began this exercise.
26. Why is the beach closed today?
- a. There are sharks in the water. They swim near the shore.
 - b. There are sharks in the water. They have swum near the shore.
 - ☒ c. There are sharks in the water. They are swimming near the shore.
 - d. There are sharks in the water. They swam near the shore.
27. Rupsha, hello! I ____ of you just a minute ago when the phone rang.
- a. have been thinking
 - ☒ b. was thinking
 - c. thought
 - d. am thinking
28. John doesn't want to go because he ____ the movie twice.
- ☒ a. has already seen
 - b. had already seen
 - c. already saw
 - d. A and B.
29. Many people tell me I ____ my mother.
- a. would resemble
 - b. am resembling
 - c. resembling
 - ☒ d. resemble
30. Fauja Singh ____ a marathon runner when he was depressed.
- a. becomes
 - b. will become
 - ☒ c. became
 - d. were

- 31) From the last OC class, we can say that Neil Turok, who wrote the article for 'The Conversation,' is _____.
a) the founder of AIMS
b) a philosophy professor
c) a company CEO
d) a political activist
- 32) Angelina Lutami's entrepreneurial spirit in selling cold drinks _____.
a) allowed her to pay for her university fees
b) got her through school
c) won her a scholarship
d) made her a millionaire
- 33) In the short term, people are _____ that Angelina's work in the mathematical sciences can solve Africa's lack of basic necessities.
a) positive
b) optimistic
c) certain
d) skeptical
- 34) Computers, mobile communications and medical tech are said to be _____ to improving Africa's commerce, prosperity and public health.
a) 'the drivers'
b) 'the pioneers'
c) 'the innovations'
d) 'the model'
- 35) The main motivation behind setting up AIMS was _____.
a) to attract European talent
b) to train students from African countries to go work abroad
c) to encourage homegrown solutions
d) to reduce unemployment
- 36) According to Turok, in his experience of visiting many African countries, maths is seen as _____ to everyday life,
a) being connected
b) integral
c) completely disconnected
d) somewhat irrelevant
- 37) The GAFA recruiters _____.
a) though, seem to think differently
b) also hold this view
c) show neutrality on the subject
d) are undecided on the matter
- 38) According to the article, AIMS centres are _____.
a) already situated throughout the African continent
b) in just 15 African countries
c) not going to expand into more African countries
d) due to increase
- 39) Ndifon, a Princeton graduate, new at AIMS, had _____ affecting the quality of vaccinations.
a) a breakdown
b) encouragement
c) an issue
d) a breakthrough

40) The Next Einstein Summit is linked to _____.

- a) science and technology
- b) science
- c) technology
- d) None of the above

Q.C.M n°1 Physics

41 – The hydrogen atom is composed of one electron and one proton. The electric force applied to the electron is :

- ☒ a) Attractive ☐ b) Repulsive ☐ c) Tangent to the electron path

42 – The hydrogen atom is still considered (question 41). The electric field $\vec{E}(M)$ created by the nucleus and applied on the point M where is located the electron is :

- ☐ a) Undefined at the point M
☐ b) Oriented from M to the nucleus
☒ c) Oriented from M to the infinity

43 – The electric field lines created by a charge q are :

- ☒ a) Circles
☐ b) Ellipses
☒ c) Straight lines

44 – A negative potential at the point M $V(M)$ is considered. Which particle at this point M has the smallest energy ?

- ☐ a) The electron
☒ b) The proton
☐ c) Both particles

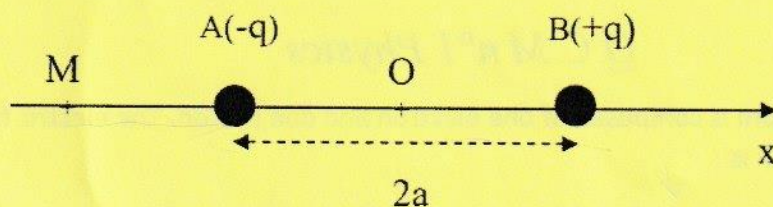
45 – The electric field \vec{E} applied at the point M and created by a negative charge located at this same point M is :

- ☐ a) Attractive
☐ b) Null
☒ c) Undefined

46 – The electric field vector created by a charge q_A located at the point A on the point M is :

- ☒ a) $\vec{E}_A(M) = k \frac{q_A}{(AM)^2} \cdot \overrightarrow{AM}$
☒ b) $\vec{E}_A(M) = k \frac{q_A}{(AM)^3} \cdot \overrightarrow{AM}$
☐ c) $\vec{E}_A(M) = k \frac{q_A}{AM} \cdot \overrightarrow{AM}$

47 – The following charge distribution is considered, the point O being located at the middle of AB



The electric field vector applied at the point M and created by the electric doublet $(-q, +q)$ is:

- a) Null
- b) Perpendicular to the (Ox) axis
- c) On the (Ox) axis and oriented to $x < 0$
- d) On the (Ox) axis and oriented to $x > 0$

48 – The electric field magnitude applied on the point O and created by the electric doublet $(-q, +q)$ from the question 47 express as:

- a) $E(O) = k \frac{q}{4a^2}$
- b) $E(O) = k \frac{2q}{a^2}$
- ↓ c) $E(O) = 0$

49 – The distribution of question 47 is still considered. The electric potential at the point A is:

- a) $V(A) = k \frac{q}{2a}$
- b) $V(A) = -k \frac{q}{2a}$
- c) $V(A) = k \frac{q}{a}$

50 – The electric potential energy of the charge located at the point A is:

- a) $E_{pe}(A) = k \frac{q^2}{2a}$
- b) $E_{pe}(A) = -k \frac{q^2}{2a}$
- c) $E_{pe}(A) = -k \frac{q^2}{4a^2}$
- d) $E_{pe}(A) = 0$

Electronics QCM – InfoS3 ENG

Mind to well read the questions and the answers suggested (be careful about the answers numbering).

Q1. The intensity of the current that enters the passive dipole is superior to the intensity of the current that is getting out of the dipole.

a- TRUE

→ **b- FALSE**

Q2. When two resistances R_1 and R_2 are connected in serie, then is retained :

a- The electric voltage at the terminals of R_1

→ **b- The electric current that passes through R_1**

c- Nothing

Q3. An open electric switch has :

a- An infinite current passing through it

b- A null voltage at its terminals

c- An infinite voltage at its terminals

→ **d- Neither of these answers**

Q4. E_1 and E_2 are two ideals voltage generators. It is possible to replace them by only one generator E if they are :

→ **a- in serie**

c- Neither of these answers

b- in parallel

The following circuit is considered (Q5&6) :

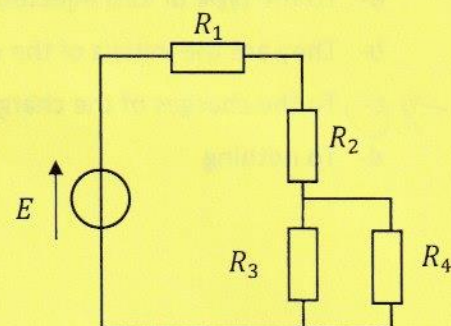
Q5. The Norton generator seen by R_3 is :

→ a. $I_N = \frac{E(R_3+R_4)}{(R_1+R_2).(R_3+R_4)+R_3.R_4}$

b. $I_N = \frac{E}{R_1+R_2+R_4}$

c. $I_N = \frac{E}{R_1+R_2}$

d. $I_N = \frac{E}{R_1+R_2+R_3+R_4}$



Q6. The Thevenin resistance seen by R_4 is :

a. $R_{th} = \frac{R_1 \cdot R_2 \cdot R_3}{R_1 \cdot R_2 + R_1 \cdot R_3 + R_2 \cdot R_3}$

c. $R_{th} = R_1 + \frac{R_2 \cdot R_3}{R_2 + R_3}$

→ b. $R_{th} = \frac{(R_1 + R_2) \cdot R_3}{R_1 + R_2 + R_3}$

d. $R_{th} = R_1 + R_2 + \frac{R_3 \cdot R_4}{R_3 + R_4}$

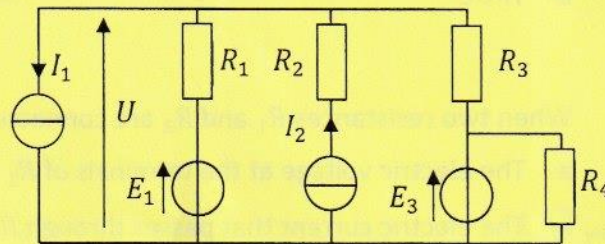
Q7. Which formula is correct ?

a. $U = \frac{\frac{E_1}{R_1} - I_1 + I_2 + \frac{E_3}{R_3}}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4}}$

→ b. $U = \frac{\frac{E_1}{R_1} - I_1 + I_2 + \frac{E_3}{R_3}}{\frac{1}{R_1} + \frac{1}{R_3}}$

c. $U = \frac{\frac{E_1}{R_1} - I_1 + I_2 + \frac{E_3}{R_3 + R_4}}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3 + R_4}}$

d. $U = \frac{\frac{E_1}{R_1} - I_1 + I_2 - \frac{E_3}{R_3}}{\frac{1}{R_1} + \frac{1}{R_3}}$



Q8. The doping allows the semi-conductor resistivity decrease

? a- TRUE

b- FALSE

Q9. If the Silicon is taken as semi-conductor and it is doped with Silicon, then the result is :

a- N doping

c- NP doping

b- P doping

→ d- No doping

Q10. Two types of doping are qualified by letters P and N. What does the letters correspond to ?

a- To the type of ions injected into the semi-conductor

b- They are the initials of the electronic scientists that discovered semi-conductors

→ c- To the charges of the charge carrier in excess

d- To nothing

Test 1

Computer Architecture

Monday 30 September 2019

For all the questions, one or more answers are possible.

11. The term 'assembler' can refer to:

- ☒ A. A programming language.
- ☒ B. A program that converts a source code into machine code.
- C. A very fast microprocessor.
- D. A very smart person.

12. The address bus of the 68000 is:

- A. 16 bits wide
- B. 32 bits wide
- ☒ C. 24 bits wide
- D. 64 bits wide

13. The data bus of the 68000 is:

- A. 64 bits wide
- ☒ B. 16 bits wide
- C. 24 bits wide
- D. 32 bits wide

14. Which are the privilege modes of the 68000?

- ☒ A. The supervisor mode
- B. The beginner mode
- ☒ C. The user mode
- D. The kernel mode

15. Which mnemonic is an assembler directive?

- A. MOVE
- ☒ B. ORG
- C. ADD
- D. ILLEGAL

16. Which mode is used by operating systems?

- ☒ A. The supervisor mode
- B. The beginner mode
- C. The user mode
- D. The kernel mode

17. Which mode has limited privileges?

- A. The supervisor mode
- B. The beginner mode
- ☒ C. The user mode
- D. The kernel mode

18. The 68000 has:

- A. 16 data registers
- B. 32 data registers
- ☒ C. 8 data registers
- D. 64 data registers

19. The 68000 has:

- A. 16 address registers
- B. 32 address registers
- ☒ C. 8 address registers
- D. 64 address registers

20. The 68000 has:

- A. 4 status registers
- ☒ B. 1 status register
- ? C. 2 status registers
- D. 8 status registers