

ALGO  
MCQ

1. For the declaration

TYPES way  
USES is, the

the operation this : is x the -> way is ?

- (a) An observer
- X (b) An internal operation
- (c) A reporter
- (d) An external operation
- (e) An observator

2. The definition of an operation is composed of ?

- X (a) a name
- X (b) a profile
- (c) a nickname
- (d) a prefix
- (e) a suffix

3. The USES area is used to specify ?

- (a) The defined types
- X (b) The predefined types

4. The TYPES area is used to specify ?

- X (a) The defined types
- (b) The predefined types

5. An observer ?

- X (a) has at least one defined parameter
- (b) has at least one predefined parameter
- (c) returns a defined type result
- X (d) returns a predefined type result

6. For the declaration

TYPES infinity, and  
USES beyond

the operation to : infinity x and -> beyond is ?

- X (a) An observer
- (b) An internal operation
- (c) A reporter
- (d) An external operation
- (e) An observator

7. Which operations define a vector ?

- (a) integer
- (b) length
- X (c) vect
- X (d) modify

8. A constant is a function that ?

- (a) has at least one defined parameter
- (b) has at least one predefined parameter
- X (c) has no parameters
- (d) returns nothing

9. For the declaration

```
TYPES Kenny  
USES they, killed
```

the operation `Omg : they x killed -> Kenny` is ?

- (a) An observer
- X (b) An internal operation
- (c) A reporter
- (d) An external operation
- (e) An observator

10. An internal operation ?

- (a) has at least one defined parameter
- (b) has at least one predefined parameter
- X (c) returns a defined type result
- (d) returns a predefined type result



# MCQ 1

Monday, 2 October

## Question 11

Consider two sets  $A$  and  $B$ . Then:

- a.  $\text{Card}(A \cap B) = \text{Card}(A) \times \text{Card}(B)$ .
- b.  $\text{Card}(A \cap B) = \text{Card}(A) + \text{Card}(B)$
- x 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. None of the others

## Question 12

Consider the set  $E = \{0, 1, 2, 3, 4\}$ . A 3-tuple of  $E$  is an element of  $E^3$ , that is, an object of the form  $(a, b, c)$  where  $a, b$  and  $c$  are elements of  $E$ . Then:

- x a. The number of 3-tuples of  $E$  containing distinct elements is  $3 \times 4 \times 5$ .
- b. The number of 3-tuples of  $E$  containing distinct elements is  $5^3$ .
- c. The total number of 3-tuples of  $E$  is  $3 \times 4 \times 5$ .
- x d. The total number of 3-tuples of  $E$  is  $5^3$ .
- e. None of the others

## Question 13

Select the correct answer(s):

- a. The number of anagrams of the word "MATH" is 4.
- x b. The number of anagrams of the word "MATH" is 4!
- c. The number of anagrams of the word "TOTEM" is 5.
- d. The number of anagrams of the word "TOTEM" is 5!
- e. None of the others

### Question 14

A box contains 5 balls, numbered 1 to 5. You pick 3 balls simultaneously. The number of possible results is:

- a.  $3 \times 4 \times 5$
- b.  $5^3$
- c.  $3^5$
- X d. 10
- e. None of the others

### Question 15

Select the correct answer(s):

- a.  $5! - 3! = 2!$
- X b.  $8! = 6! \times 7 \times 8$
- X c.  $\frac{15!}{13! \times 2!} = 7 \times 15$
- d.  $\frac{15!}{13! \times 2!} = 13 \times 7 \times 15$
- e. None of the others

### Question 16

Let  $E$  be a set of cardinal 7. The number of 4-element subsets of  $E$  is:

- a.  $4^7$
- b.  $4 \times 5 \times 6 \times 7$
- X c.  $\binom{7}{4}$
- d.  $2^7$
- e. None of the others

### Question 17

Let  $n \in \mathbb{N}$  and  $k \in [0, n]$ . Then:

- a.  $\binom{n}{k} = \frac{n!}{k!}$
- b.  $\binom{n}{k} = \frac{n!}{(n-k)!}$
- c.  $\binom{n}{k} = \frac{k!}{n!}$
- d.  $\binom{n}{k} = \frac{k!}{(k-n)!}$
- X e. None of the others



### Question 18

Let  $n \in \mathbb{N}$ . Then:

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

b.  $\binom{n}{n} = 1$

c.  $\binom{n}{1} = n$

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

e. None of the others

### Question 19

Let  $n \in \mathbb{N}$  and consider two real numbers  $x$  and  $y$ . Then  $(x + y)^n = \sum_{k=0}^n \binom{n}{k} x^k y^k$

a. True

b. False

### Question 20

Assume your class has 40 students. You need to choose one delegate and two substitute delegates (they have to be three different students from your class).

The number of possible choices is  $40 \times \binom{39}{2}$ .

a. True

b. False

# MCQ Electronics – InfoS1

Read the questions AND the answers provided (pay attention to the numbering of the answers)

**Q21.** What is an electrical current?

- a- A potential difference
- b- An orderly displacement of electrical charges
- c- A displacement of electrical charges
- d- A heat dissipation

**Q22.** A dipole resistance is:

- a- Its strength
- b- Its ability to resist current flow
- c- Its durability

**Q23.** What is the unit of an electrical resistance?

- a- Volts (V)
- b- Amperes (A)
- c- Ohms ( $\Omega$ )
- d- Watts (W)

**Q24.** What is the law to be used to write a relation between voltages?

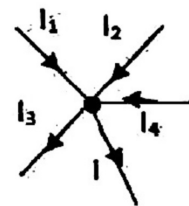
- a- Law of nodes
- b- Law of loops

**Q25.** In the diagram on the right, we set the following currents:

$$I_1 = 5mA; I_2 = 1mA; I_3 = -1mA; I_4 = -3mA$$

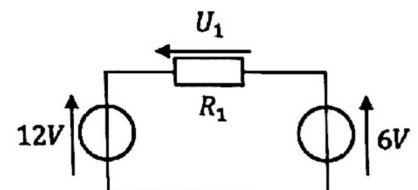
Calculate the current  $I$ .

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



**Q26.** Consider the diagram on the right, then calculate the voltage  $U_1$  ?

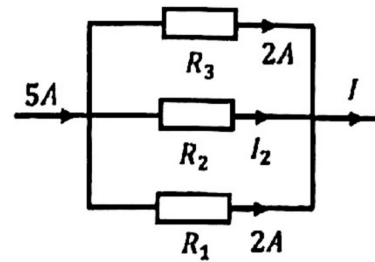
- a. -18V
- b. -6V
- c. 6V
- d. 18V



Consider the diagram on the right (Q27 to 30)

Q27. The 3 resistors  $R_1$ ,  $R_2$  et  $R_3$  are:

- a- In series
- X b- In parallel (derlvation)



Q28. Calculate the Intensity of current  $I$ ?

- a-  $1A$
- X b-  $5A$
- c-  $2A$
- d- Unknown

Q29. Calculate the Intensity of current  $I_2$ ?

- X a-  $1A$
- b-  $5A$
- c-  $2A$
- d- Unknown

Q30. What can be said about resistors  $R_1$  and  $R_3$  ?

- a-  $R_1 < R_3$
- b-  $R_1 = R_3$
- c-  $R_1 > R_3$
- d- Unknown

# Test 1

## Computer Architecture

Monday 2 October 2023

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

31. Which number is equal to  $2^{18}$ ?
- A. 262,144
  - B. 131,072
  - C.  $2^{19} - 2^{18}$
  - D. None of these answers.
32. Which number is equal to  $2^{-8}$ ?
- A. 0.0078125
  - B. 0.00391625
  - C. 0.001953125
  - D. None of these answers.
33. Which is the weight of the digit C in the following number:  $ABCD_{16}$ ?
- A. 1
  - B. 12
  - C. 16
  - D. None of these answers.
34. Which is the result of the following subtraction:  $1000_{16} - 1_{16}$ ?
- A.  $999_{16}$
  - B.  $FFF_{16}$
  - C.  $1FFF_{16}$
  - D. None of these answers.
35. Which is the result of the following addition:  $299_{16} + 1_{16}$ ?
- A.  $30A_{16}$
  - B.  $300_{16}$
  - C.  $29A_{16}$
  - D. None of these answers.

36.  $239_{10} =$   
A.  $11101101_2$   
B.  $DF_{16}$   
x C.  $11101111_2$   
D. None of these answers.
37.  $CAB_{16} =$   
A.  $110010111011_2$   
B.  $3,244_{10}$   
C.  $101110101100_2$   
x D. None of these answers.
38.  $3,201_{10} =$   
A.  $C80_{16}$   
x B.  $C81_{16}$   
C.  $C82_{16}$   
D. None of these answers.
39.  $AC7F_{16} =$   
x A.  $1010110001111111_2$   
x B.  $44,159_{10}$   
x C.  $AC80_{16} - 1_{16}$   
D. None of these answers.
40.  $20000_{16} =$   
x A.  $2^{17}$   
B.  $2^{18}$   
x C.  $2^{18} - 2^{17}$   
D. None of these answers.

2/10/2023

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

41. Children depend \_\_\_ their parents for guidance.

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

42. The United States \_\_\_ a lot for the environment.

- x 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
- x 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
- x d. all the information

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

- a. wich
- b. witch
- x 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.
- X 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
- X d. traits and characteristics

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

- a. branching trees
- X 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