ALGO
MCQ

1. **A list is a structure intrinsically ?**

(a) Recursive
(b) Iterative
(c) Repetitive
(d) Alternative

2. **The array-based implementation of an iterative list is ?**

(a) static
(b) linked
(c) contiguous
(d) dynamic

3. **An operation without an argument is ?**

(a) impossible
(b) a constant
(c) a variable
(d) partial

4. **The array-based implementation of a recursive list is ?**

(a) static
(b) linked
(c) contiguous
(d) dynamic

5. **In an axiom, we must replace the variable by an internal operation when applying ?**

(a) an observer to an internal operation which has two defined arguments
(b) an observer to an internal operation which has only one predefined argument
(c) an observer to an internal operation which has only one defined argument
(d) an internal operation to an observer which has only one predefined argument

6. **Which operations define a vector ?**

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

7. **The linked-list implementation is ?**

   (a) static
   (b) ecstatic
   (c) contiguous
   (d) dynamic

8. **The linked-list implementation of an iterative list is not possible ?**

   (a) false
   (b) true

9. **Which operations do opé1 and opé2 represent in the following axiom (where e is an element and l a list)** `opé1(opé2 (e,l)) = e` **?**

   (a) opé1 = first, opé2 = head
   (b) opé1 = cons, opé2 = first
   (c) opé1 = first, opé2 = cons
   (d) opé1 = tail, opé2 = first

10. **The making of an iterative list is based on ?**

    (a) The insertion of an element at the first box of the list
    (b) The recovery of the rest of the list
    (c) The insertion of an element at the Kthbox

MCQ 4

Monday, 20 November

Question 11

Consider $(a, b) \in \mathbb{Z}^2$ such that a divides b. Then:

a. $\exists\, k \in \mathbb{Z}$ such that $a = bk$

b. $\forall\, k \in \mathbb{Z}$ such that $a = bk$

c. $\exists\, k \in \mathbb{Z}$ such that $b = ak$

d. $\forall\, k \in \mathbb{Z}$ such that $b = ak$

e. None of the others

Question 12

The remainder of the euclidean division of -10 by 4 is

a. -2

b. 2

c. 0

d. The euclidean division of -10 by 4 cannot be done, it has no result.

Question 13

Consider $(a, b) \in \mathbb{Z}^2$ such that $a \equiv 3\,[8]$ and $b \equiv -5\,[8]$. Then:

a. $b \equiv 3\,[8]$.

b. $2a - b \equiv 2\,[8]$

c. $ab \equiv 1\,[8]$

d. $a^3 \equiv 2\,[8]$

e. None of the others

Question 14

Let $a \in \mathbb{Z}$. Select the correct answer(s)

a. If $a = 8 \times 131 + 4$ then $a \equiv 4\,[131]$.

b. $\exists ! r \in [\![0, 4]\!]$ such that $a \equiv r\,[5]$.

c. If $a \equiv 0\,[3]$ then a is a divisor of 3

d. If $a \equiv 0\,[3]$ then a is a multiple of 3

e. None of the others

Question 15

Let $(a, b) \in \mathbb{N}^2$, both a and b non zeros. The GCD of a and b is denoted by $a \wedge b$. Then:

a. $a \mid a \wedge b$

b. $a \wedge b \mid a$

c. Let $d \in \mathbb{N}^*$. If $d \mid a$ and $d \mid b$ then $d \leq a \wedge b$.

d. $a \wedge b$ is always a prime number.

e. None of the others

Question 16

Select the correct answer(s)

a. 1 is a prime number.

b. 2 is a prime number.

c. 3 is a prime number.

d. 4 is a prime number.

e. None of the others

Question 17

Let $(a, b) \in \mathbb{Z}^2$ and let $a \wedge b$ be the GCD of a and b. The property "$a \wedge b = 1$ if and only if $\exists (u, v) \in \mathbb{Z}^2$ such that $au + bv = 1$" is:

a. true

b. false

Question 18

Let $(a, b) \in \mathbb{Z}^2$ and let $a \wedge b$ be the GCD of a and b. The property "$a \wedge b = 3$ if and only if $\exists (u, v) \in \mathbb{Z}^2$ such that $au + bv = 3$" is:

a. true

b. false

Question 19

Let p be a prime number. Fermat's little theorem states that:

a. $\forall n \in \mathbb{N},\ n^p \equiv p[n]$

b. $\forall n \in \mathbb{N},\ p^n \equiv p[n]$

c. $\forall n \in \mathbb{N},\ n^p \equiv n[p]$

d. $\forall n \in \mathbb{N},\ p^n \equiv n[p]$

e. None of the others

Question 20

Select the correct answer(s)

a. $\forall a \in \mathbb{Z},\ a \mid 1$

b. $\forall a \in \mathbb{Z},\ 1 \mid a$

c. $\forall (a, b) \in \mathbb{Z}^2,\ a \mid 2$ and $b \mid 2 \implies a + b \mid 2$

d. None of the others

MCQ Electronics – InfoS1

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

Consider the sinusoidal voltage $v(t) = V.\sqrt{2}.sin(\omega t + \varphi)$. $\underline{V}$ is the complex amplitude associated to $v(t)$.(Q21 to 25)

Q21. By convention, V is a positive real value, in Volt

a. TRUE
b. FALSE

Q22. What is the maximum value of $v(t)$?

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

Q23. What does φ stand for?

a. The pulsation
b. The frequency
c. The period
d. The phase shift

Q24. What is the module of $\underline{V}$?

a. V
b. φ
c. ωt
d. $V.\sqrt{2}$

Q25. What is the argument $\underline{V}$?

a. $\omega t + \varphi$
b. φ
c. ωt
d. V

Q26. Which formula represents the complex impedance of a capacitor with capacitance C?

a. $jC\omega$
b. $\frac{1}{jC\omega}$
c. $-jC\omega$
d. $\frac{j}{C\omega}$

Q27. Which formula represents the complex impedance of a coil with inductance L?

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

Consider a resistance R, a capacitor with capacitance C ans a coil with inductance L. (Q28 to 30)

Q28. The coil and the capacitor are associated in series. What is the equivalent complex impedance $\underline{Z}$?

a. $\underline{Z} = L + C$

b. $\underline{Z} = jC\omega + \frac{1}{jL\omega}$

c. $\underline{Z} = j(L + C)\omega$

d. $\underline{Z} = \frac{1-LC\omega^2}{jC\omega}$

Q29. The coil and the capacitor are associated in parallel. What is the equivalent complex impedance $\underline{Z}'$?

a. $\underline{Z}' = \frac{1}{L} + \frac{1}{C}$

b. $\underline{Z}' = \frac{1}{jL\omega} + jC\omega$

c. $\underline{Z}' = \frac{1-LC\omega^2}{jC\omega}$

d. $\underline{Z}' = \frac{jL\omega}{1-LC\omega^2}$

Q30. The resistor and the capacitor are associated in parallel. What is the equivalent complex impedance $\underline{Z}''$?

a. $\underline{Z}'' = \frac{1}{R} + jC\omega$

b. $\underline{Z}'' = \frac{R}{1+jRC\omega}$

c. $\underline{Z}'' = \frac{jRC\omega}{R+jC\omega}$

d. $\underline{Z}'' = \frac{1}{R} + C$

Test 5
Computer Architecture

Monday 20 November 2023

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

31. $A \oplus B =$
    - A. $\overline{A}.B + A.\overline{B}$
    - B. $\overline{A}.\overline{B} + A.B$
    - C. $\overline{A} \oplus \overline{B}$
    - D. $\overline{A} \oplus B$

32. $A + A.B =$
    - A. 0
    - B. A
    - C. 1
    - D. B

33. $A + \overline{A}.B =$
    - A. A
    - B. B
    - C. $\overline{A}.B$
    - D. $A + B$

34. $\overline{A.B} =$
    - A. $\overline{A}.\overline{B}$
    - B. $A + B$
    - C. $\overline{A} + \overline{B}$
    - D. None of these answers.

35. $A + B.C =$
    - A. $(A + B).(A + C)$
    - B. $(A + B).(B + C)$
    - C. $(A + C).(B + C)$
    - D. None of these answers.

36. $A + B + C + D + E + \overline{A} =$
    A. 0
    B. 1
    C. A
    D. B + C + D + E

37. $A.B.C.D.E.\overline{A} =$
    A. 0
    B. 1
    C. A
    D. B.C.D.E

38. $(A + \overline{A}).B.C.D.E =$
    A. 0
    B. 1
    C. A
    D. B.C.D.E

39. $A + A.B + A.B.C + A.B.C.D =$
    A. 0
    B. 1
    C. A
    D. None of these answers.

40. $A + \overline{A}.B + \overline{A}.B.C + \overline{A}.B.C.D =$
    A. 0
    B. 1
    C. A + B
    D. None of these answers.

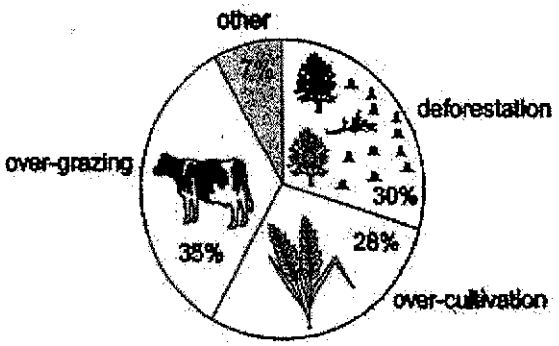
ADP MCQ5, S1 B2

20/11/2023

Graphs:

Questions 41 and 42 refer to the following:

Causes of worldwide land degradation



Causes of land degradation by region

Region	% land degraded by...			
	deforestation	over-cultivation	over-grazing	Total land degraded
North America	0.2	3.3	1.5	5%
Europe	9.8	7.7	5.5	23%
Oceania*	1.7	0	11.3	13%

* A large group of islands in the South Pacific including Australia and New Zealand

41. Which of the following sentences will be an appropriate introduction for the above images?

a. The images show the causes of land degradation over the world.
b. The pie chart illustrates the primary causes of land deterioration across the globe while the table outlines how three different regions were affected by these damaging factors.
c. These graphs illustrate the effects of land degradation in different parts of the world.
d. The graphs compare the reasons of land degradation across the world.

42. Which of the following is NOT TRUE?

a. The biggest cause of land degradation worldwide is over-grazing.
b. Europe has the highest percentage of degraded land.
c. Deforestation is the second biggest cause of land degradation in these regions.
d. Over-cultivation is more of a problem in Oceania than in North America.

Questions 43, 44 and 45 refer to the following:

Underground Railway Systems

City	Date opened	Kilometres of route	Passengers per year (in millions)
London	1863	394	775
Paris	1900	199	1191
Tokyo	1927	155	1927
Washington DC	1976	126	144
Kyoto	1981	11	45
Los Angeles	2001	28	50

43. Which of the following is an appropriate introduction for describing the table above?

a. The provided table compares the Underground Railway system of London to that of five other major cities of the world.
b. The table illustrates different underground railway systems of the world.
c. The table gives information about the passengers per year and the length of the routes covered by the underground railway systems of six major cities of the world along with the years when they were founded.
d. The given table compares the oldest underground railway system of the world to the newest one.

44. Which city has the shortest route?

a. Los Angeles
b. London
c. Washington DC
d. Kyoto

45. Which city has the busiest underground railway system?

a. Kyoto
b. London
c. Tokyo
d. Paris

Grammar:
46. Have you ever _____ in the Mediterranean Sea?

a. swam
b. swim
c. swimming
d. swum

47. Last time, I _____ my blazer (jacket).

a. wore
b. wear
c. worn
d. weared

48. The Internet connection hasn't worked _____ Saturday.

a. as long as
b. since
c. for
d. during

49. The floodwaters have gone down a lot _____ the rain stopped.

a. as long as
b. since
c. for
d. during

50. Charlie has been in Sri Lanka _____ about three months.

a. as long as
b. since
c. for
d. during

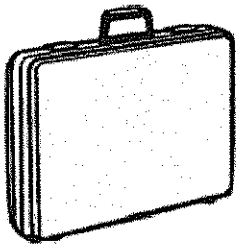
Look at the following texts and answer the questions 51 to 55:

https://www.harrisludlow.com/wayfarer200

Harris Ludlow

Home | Place Order | **Products** | Customer Service | Contact Us

Size	Price
50 cm (carry-on)	$145
60 cm	$179
70 cm	$225
Complete set	$515



Colors: Classic Black (coming soon—Ocean Blue)

Details:
Designed for hard use, the Wayfarer 200 luggage set features three pieces that are both lightweight and durable.

- Expandable central pockets
- Four rotating wheels
- Easy-opening, tight-sealing clasps

https://www.harrisludlow.com/wayfarer200/reviews

April 18

I frequently travel for business, often carrying fragile samples with me on the plane. Most carry-ons these days are soft-sided, so it was a relief to find something that offers adequate protection. I've been mostly happy with the carry-on, but the larger bags have caused some problems. My black cases look so similar to everyone else's that other travelers have almost taken them by mistake! More variety would be nice.

I also have some reservations about the mechanical elements of this set. In particular, the retraction mechanism of the wheels appears so delicately constructed as to be in danger of collapse.

Asina Amorapanth

https://www.harrisludlow.com/wayfarer200/messages

April 20

Dear Ms. Amorapanth,

We're sorry to hear about your trouble with our product. As a result of feedback like yours, we've introduced a new color option. If you contact us at customersupport@hlluggage.com, we'll send you, in our attractive new color, a duplicate of the large suitcase to complement your Wayfarer 200 set. Note that this gift will be sent to you after you verify that you posted the April 18 review.

We also hear your concerns about our luggage components. Rest assured that our lightweight mechanism has been proven to withstand years' worth of rough treatment, retracting and extending smoothly over 10,000 times under stressful conditions in our laboratories.

Damien Cosme, Harris & Ludlow customer service

Turn to the next page

51. What does Ms. Amorapanth write about her luggage?
    a. She likes the color.
    b. The cases are too large.
    c. She purchased the bags recently.
    d. The carry-on protects her samples.

52. In the review, the word "reservations" in paragraph 2, line 1, is closest in meaning to
    a. arrangements
    b. concerns
    c. experiences
    d. features

53. What does Mr. Cosme offer to Ms. Amorapanth?
    a. A full set of blue luggage
    b. A full set of black luggage
    c. A large blue suitcase
    d. A small black suitcase

54. What must Ms. Amorapanth do in order to receive a gift from Harris Ludlow?
    a. Prove that she is the author of a product review
    b. Complete a survey about new products
    c. Retract negative feedback given on a Web site
    d. Send a package containing a defective suitcase

55. What does Mr. Cosme indicate about the wheels of the suitcases?
    a. They have been thoroughly tested.
    b. They have been redesigned to roll more easily.
    c. They are as small as possible for the size of the suitcase.
    d. They are less noisy than those of previous models.

Turn to the next page

Questions 56-60 refer to the following notice, e-mail, and article.

Attention Everyone: Group Photo This Saturday

Exciting news—*Tasty Bites Magazine* will be featuring our restaurant in an article about Dublin's best dining establishments! They have arranged for one of their photographers to photograph us on Saturday, 4 June, at 10:00 A.M., before preparations for the day begin.

All employees will be included, so please plan to come in a bit sooner than scheduled on Saturday morning wearing your uniform. The session will take 30 minutes.

We have achieved so much since we opened, and you should all be very proud of this recognition.

To:	Herman Keel <hkeel@bentonsidebistro.net>
From:	Hilary Seaton <hseaton@hbsphotography.com>
Date:	Wednesday, 1 June
Subject:	Saturday Photography Appointment

Dear Mr. Keel,

I am writing to confirm your group photography session at 10:00 A.M. on Saturday. As discussed, this photo shoot will take place at your restaurant, and I will photograph your staff along the wall in the main dining hall. You mentioned that your waitstaff will need to start getting ready for the day at 10:30 A.M., and that should not be a problem. The shoot should be finished by 10:30 A.M.

Please let me know if you have any questions. Otherwise I will see you on Saturday!

Hilary Seaton
HBS Photography

Bistro Pleases

Enter Bentonside Bistro any day for lunch or dinner, and you'll hear the sounds of clinking forks and chattering patrons. "That's the sound of happy diners," says Herman Keel, the restaurant's owner.

Opened two years ago, the bistro has exceeded expectations. The menu features traditional Irish dishes prepared by chef Deirdre Hanrahan. She notes, "We choose ingredients that are at the height of summer, fall, winter, and spring, and showcase these on our menu."

On a recent Wednesday afternoon, Jacinta Coelho, a visitor from Brazil, was dining at the bistro. "I can't get over the freshness and homemade taste!" exclaimed Ms. Coelho. "It's like the chef went outside and selected the ingredients just for me."

Bentonside Bistro is located at 1644 Bentonside Road and is open Tuesday through Saturday from 11:30 a.m. to 9:00 p.m. The interior is painted in bright shades of blue reminiscent of the ocean, with a rotating gallery of artwork adorning the walls. The staff is friendly and the delicious food is reasonably priced. Reservations are not required.

By Declan Mulroney, Staff Writer

Turn to the next page

56. Who most likely posted the notice?

a. Ms. Seaton
b. Mr. Keel
c. Ms. Hanrahan
d. Mr. Mulroney

57. What are employees instructed to do on June 4?

a. Arrive earlier than usual
b. Attend an awards banquet
c. Be interviewed for a newspaper article
d. Discuss locations for a photo shoot

58. What is indicated about the waitstaff?

a. They have been featured in Tasty Bites Magazine more than once.
b. They will be photographed against a blue background.
c. They take turns working the morning shift.
d. They wear brightly colored uniforms.

59. What is true about the Bentonside Bistro?

a. It is open every day for lunch.
b. It has recently changed ownership.
c. It specializes in Brazilian cuisine.
d. It revises the menu seasonally.

60. What does Ms. Coelho say about her meal?

a. She is impressed with the quality of it.
b. She would like to prepare one like it at home.
c. She saw it featured in a magazine.
d. She thought it was reasonably priced.