

Answer-key

Max. Marks = 15

- Que. 1 Fill in the blanks with suitable forms of verbs.
(1 x 5 = 5 marks)
- The rain _____ yet. (not stop)
 - He _____ the project next week. (finish)
 - The baby _____ asleep ten minutes ago. (fall)
 - She _____ her home-work everyday. (do)
 - The college _____ this course since 2009. (run)

- Answers -
- has not stopped
 - will finish
 - fell
 - does
 - has been running

- Que. 2 Identify the sentence patterns in the following sentences.
(1 x 5 = 5 marks)
- She gave her a gift.
 - Birds fly.
 - They appointed him secretary.
 - I have an admirer.
 - He painted the door black.

- Answers -
- NP + Verb (transitive) + NP + NP
(Noun Phrase) (Indirect object) (direct object)
 - NP + Verb (Intransitive)
(Noun Phrase)
 - NP + Verb (transitive) + NP + NP
(Noun Phrase) (Indirect object) (object complement)

Ans. 2 d) NP + Verb (have type) + NP
(Noun Phrase) (Noun Phrase)

e) NP + Verb (transitive) + NP + Adjective
(Noun Phrase) (Noun Phrase)

Que. 3 Correct the following sentences. (1x5 = 5 marks)

a) They are building this bridge since 2005.

Ans. They have been building this bridge since 2005.

b) When I met my friend in the library, he was studying for two hours.

Ans. When I met my friend in the library, he had been studying for two hours.

c) He will learn French these days.

Ans. He is learning French these days.

d) They practised much before they performed on stage.

Ans. They had practised much before they performed on stage.

e) They have returned from Chennai last week.

Ans. They returned from Chennai last week.

Ques (1) यदि $A = [x \ y \ z]$, $B = \begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix}$, $C = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$ तो ज्ञात करें (5)

कीजिये (a) $A(BC)$ (b) $(AB)C$

Solution: (a) $BC = \begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} ax + hy + gz \\ hx + by + fz \\ gx + fy + cz \end{bmatrix}$

$$\Rightarrow A(BC) = [x \ y \ z] \begin{bmatrix} ax + hy + gz \\ hx + by + fz \\ gx + fy + cz \end{bmatrix}$$

$$= x(ax + hy + gz) + y(hx + by + fz) + z(gx + fy + cz)$$

$$= ax^2 + hxy + gxz + hxy + by^2 + fyz + gxz + fyz + cz^2$$

$$= ax^2 + by^2 + cz^2 + 2hxy + 2fyz + 2gxz$$

(b) $AB = [x \ y \ z] \begin{bmatrix} a & h & g \\ h & b & f \\ g & f & c \end{bmatrix} = \begin{bmatrix} ax + hy + gz \\ hx + by + fz \\ gx + fy + cz \end{bmatrix}$

$$\Rightarrow (AB)C = \begin{bmatrix} ax + hy + gz \\ hx + by + fz \\ gx + fy + cz \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix}$$

$$= x(ax + hy + gz) + y(hx + by + fz) + z(gx + fy + cz)$$

$$= ax^2 + by^2 + cz^2 + 2hxy + 2fyz + 2gxz$$

Ques (2) सिद्ध करो $\begin{vmatrix} (b+c)^2 & a^2 & a^2 \\ b^2 & (c+a)^2 & b^2 \\ c^2 & c^2 & (a+b)^2 \end{vmatrix} = 2abc(a+b+c)^3$ (5)

Solution: संक्रिया $C_2 \rightarrow C_2 - C_1$, $C_3 \rightarrow C_3 - C_1$ लगाने पर

$$\begin{vmatrix} (b+c)^2 & a^2 - (b+c)^2 & a^2 - (b+c)^2 \\ b^2 & (c+a)^2 - b^2 & \cancel{b^2} \\ c^2 & 0 & (a+b)^2 - c^2 \end{vmatrix}$$

$$\Rightarrow (a+b+c)^2 \left| \begin{array}{ccc} (b+c)^2 & a-b-c & a-b-c \\ b^2 & c+a-b & 0 \\ c^2 & 0 & a+b-c \end{array} \right|$$

शक्तिम $R_1 \rightarrow R_1 - (R_2 + R_3)$ लगाने पर

$$\Rightarrow (a+b+c)^2 \left| \begin{array}{ccc} 2bc & -2c & -2b \\ b^2 & c+a-b & 0 \\ c^2 & 0 & a+b-c \end{array} \right|$$

सक्तिम $C_2 \rightarrow bC_2 \rightarrow C_1$, $C_3 \rightarrow cC_3 + C_1$ लगाने पर

$$\Rightarrow \frac{(a+b+c)^2}{bc} \left| \begin{array}{ccc} 2bc & 0 & 0 \\ b^2 & bc+ab & b^2 \\ c^2 & c^2 & ac+bc \end{array} \right|$$

$$\Rightarrow \frac{(a+b+c)^2}{bc} (2bc) \left| \begin{array}{cc} bc+ab & b^2 \\ c^2 & ac+bc \end{array} \right|$$

$$\Rightarrow 2(a+b+c)^2 [(bc+ab)(ac+bc) - b^2c^2]$$

$$\Rightarrow 2(a+b+c)^2 [abc^2 + b^2c^2 + a^2bc + ab^2c - b^2c^2]$$

$$\Rightarrow 2(a+b+c)^2 [abc^2 + a^2bc + ab^2c]$$

$$\Rightarrow 2abc(a+b+c)^2(a+b+c)$$

$$\Rightarrow 2abc(a+b+c)^3$$

Ques 3) शक्तिमों की सहायता से निम्न समीकरणों को हल कीजिए

$$3x + y - 6z = 0$$

$$-x + 3y + 4z = 5$$

$$x + y + 2z = 4$$

Solution:

$$\Delta = \begin{vmatrix} 3 & 1 & -6 \\ -1 & 3 & 4 \\ 1 & 1 & 2 \end{vmatrix}$$

$$= 3(2) - 1(-6) - 6(-4) = 6 + 6 + 24 = 36$$

$$\Delta_1 = \begin{vmatrix} 0 & 1 & -6 \\ 5 & 3 & 4 \\ 4 & 1 & 2 \end{vmatrix}$$

$$= 0 - 1(-6) - 6(-7) = 6 + 42 = 48$$

(5)

$$\Delta_2 = \begin{vmatrix} 3 & 0 & -6 \\ -1 & 5 & 4 \\ 1 & 4 & 2 \end{vmatrix} = 3(-6) - 0 - 6(-9) = -18 + 54 = 36$$

$$\Delta_3 = \begin{vmatrix} 3 & 1 & 0 \\ -1 & 3 & 5 \\ 1 & 1 & 4 \end{vmatrix} = 3(7) - 1(-9) + 0 = 21 + 9 = 30$$

अतः $x = \frac{\Delta_1}{\Delta} = \frac{48}{36} = \frac{4}{3}$, $y = \frac{\Delta_2}{\Delta} = \frac{36}{36} = 1$, $z = \frac{\Delta_3}{\Delta} = \frac{30}{36} = \frac{5}{6}$

सू (4) (संघर्ष) मैट्रिक्स विज्ञान का प्रयोग कर निम्न समी० निम्नप्र के हल कीजिए।

$$x + y + z = 2$$

$$x + 2y + 3z = 5$$

$$x + 3y + z = 0$$

(5)

सोल:- गुणांक मैट्रिक्स $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \\ 1 & 3 & 1 \end{bmatrix}$, $x = \begin{bmatrix} x \\ y \\ z \end{bmatrix}$, $B = \begin{bmatrix} 2 \\ 5 \\ 0 \end{bmatrix}$

तो दिया गया निम्नप्र $AX = B$ — (1)

अब $|A| = \begin{vmatrix} 1 & 1 & 1 \\ 1 & 2 & 3 \\ 1 & 3 & 1 \end{vmatrix} = 1(2-9) - 1(1-3) + 1(3-2)$
 $= -7 + 2 + 1 = -4$

$$\text{adj } A = \begin{bmatrix} -7 & 2 & 1 \\ 2 & 0 & -2 \\ 1 & -2 & 1 \end{bmatrix}^T = \begin{bmatrix} -7 & 2 & 1 \\ 2 & 0 & -2 \\ 1 & -2 & 1 \end{bmatrix}$$

तो $A^{-1} = \frac{\text{adj } A}{|A|} = \frac{1}{-4} \begin{bmatrix} -7 & 2 & 1 \\ 2 & 0 & -2 \\ 1 & -2 & 1 \end{bmatrix}$

समी० (1) से $x = A^{-1}B = \frac{1}{-4} \begin{bmatrix} -7 & 2 & 1 \\ 2 & 0 & -2 \\ 1 & -2 & 1 \end{bmatrix} \begin{bmatrix} 2 \\ 5 \\ 0 \end{bmatrix}$
 $= -\frac{1}{4} \begin{bmatrix} -14 + 10 + 0 \\ 4 + 0 + 0 \\ 2 - 10 + 0 \end{bmatrix}$

$$= -\frac{1}{4} \begin{bmatrix} -4 \\ 4 \\ -8 \end{bmatrix}$$

$$\Rightarrow \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ -1 \\ 2 \end{bmatrix}$$

$$\Rightarrow x=1, y=-1, z=2$$

Q1. Perform the following conversion

1) $(615)_8 = (?)_{16}$

$$\begin{array}{ccc} 6 & 1 & 5 \\ \downarrow & \downarrow & \downarrow \end{array}$$

$$\underline{000110001101}$$

$$1 \quad 8 \quad 0$$

Ans $(615)_8 = (180)_{16}$

2) $(110101011)_2 = (?)_{16}$

$$\underline{0001101011}$$

$$1 \quad A \quad B$$

$(110101011)_2 = (LAB)_{16}$

3) $(305)_{16} = (?)_{2}$

$$\underline{3 \quad 0 \quad 5}$$

$$001111010101$$

$(305)_{16} = (001111010101)_2$

4) $(2C8)_{16} = (?)_{10}$

Solue:

$$8 \times 16^0 = 8$$

$$C [12] \times 16^1 = 192$$

$$2 \times 16^2 = 512$$

$$\underline{712}$$

$(2C8)_{16} = (712)_{10}$

Q.2. What do you mean by operating system? Explain the time sharing concept of operating system.

Ans operating system:-

An operating system is a collection of software that manages computer hardware resources and provides common services for computer programs. The operating system is a vital component of the system software in a computer system.

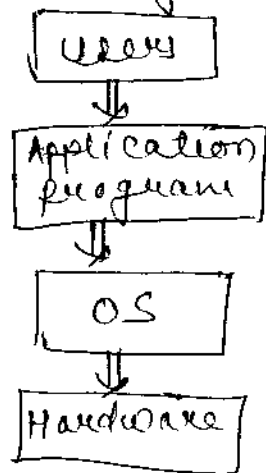


fig:- computer system.

An operating system is a program that acts as an interface between the user and the computer hardware and controls the execution of all kinds of program.

Time sharing operating system:-

Time sharing is a technique which enables many people, located at various terminal to use a particular computer system at the same time. Time-sharing or multi tasking is a logical extension of multiprogramming.

Advantages

- 1) quick response.
- 2) avoid duplication of software.
- 3) reduce CPU idle time.

Q.3.. Explain the generation of computers &

Ans.

1) First Generation: Vacuum tubes [1940-1956]-

The first computers used vacuum tubes for circuitry and magnetic drums for memory and were often enormous, taking up entire rooms. First generation computers relied on machine language, the lowest-level programming language understood by computers to perform operations. e.g. UNIVAC, ENIAC

2) Second Generation: Transistors (1956-1963)

The world would see transistors replace vacuum tubes in the second generation. Second-generation computers moved from cryptic binary machine language to symbolic or assembly language, which allowed programmers to specify.

3) Third Generation:- Integrated Circuits (1964-1971)

The development of IC was the hallmark of the computers. Instead of punched cards and printouts users interact with 3rd generation computers through keyboards and monitors and interfaced with an operating system.

4) Fourth Generation:- Microprocessors (1971-present)

The microprocessors brought the fourth generation of computers, as thousands of integrated circuits were built onto a single silicon chip.

5) Fifth Generation:- Artificial Intelligence

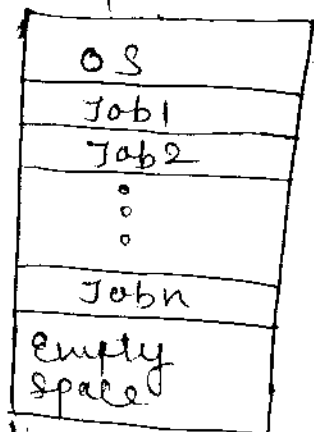
Fifth generation computing device based on AI are still in development though there are some applications such as voice recognition etc.

Definition: Multiprocessor operating system refers to the use of two or more central processing units within a single computer system. These multiple CPUs are in a close communication sharing the computers bus, memory and other peripheral devices. These system are referred as tightly coupled system.

3) Bluetooth: - To use Bluetooth wireless technology a device must be able to interpret certain Bluetooth profiles which are definitions of possible applications and specify general behaviour that Bluetooth-enabled device ~~uses~~ use to communicate with other Bluetooth devices.

Bluetooth is a standard wire-replacement communications protocols primarily designed for low-power consumption, with short range based on low cost devices.

4) Multiprogramming OS: - Sharing the processor when two or more programs reside in memory at the same time is referred as multiprogramming. It assumes a single shared processor.



Activities

fig multiprogramming.

- 1) The OS keeps several jobs in memory at a time
 - 2) This set of jobs is a subset of the job pool.
 - 3) The OS picks and begins to execute one of the jobs in the memory.
- * Advantage
- 1) High and efficient CPU utilization
 - 2) To accommodate many jobs in memory, memory management is required.

Q.4. write short note on (Any 2)

- 1) Humanware
- 2) Multiprogramming OS
- 3) Bluetooth
- 4) Multi processing

1) Humanware :-

Humanware is hardware and software, that emphasizes user capability and empowerment and the design of the user interface. The process of building humanware generally consists of these

steps:

- 1) Define users and what they really will want
- 2) Identify tasks they will need to do or capabilities they will want
- 3) Specify usability objectives for each task or capability
- 4) Build a prototype of the user interface.
- 5) Test and modify or correct the prototype.
- 6) Test the code against the prototype and if necessary redesign or recode the software
- 7) Test the product with users or valid test subjects and revise as necessary
- 8) Get feedback from users and continually improve the product.

2) Multi processing :-

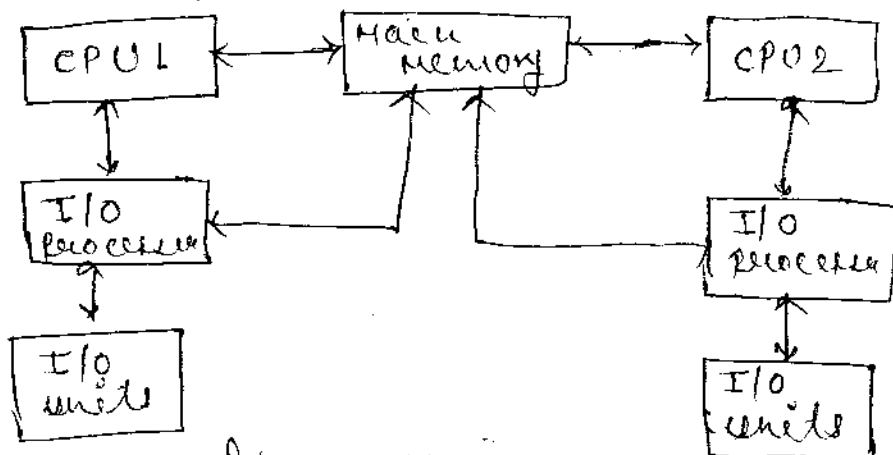


fig multi processing