

FOUR YEAR B.C.A (Honours)
DEGREE EXAMINATION, DECEMBER - 2024
CHOICE BASED CREDIT SYSTEM
THIRD SEMESTER - MAJOR

PART - II

Paper-8: Artificial Intelligence

(Under CBCS New Regulation w.e.f. the Academic Year 2024-25)

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Time : 3 Hours

Max. Marks : 75

SECTION - A

Answer any Five of the following questions. Each question carries equal marks.

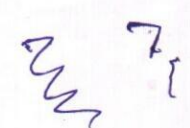
(5×3=15)

- 1. Give a short note on Knowledge representation.
2. Discuss the need of Semantic Networks.
- 3. Write a short note on Rule based Knowledge.
4. Explain matching with examples.
5. Discuss the need of Information Retrieval.
- 6. Write a short note on the use of Grammars.
- 7. Give an introduction to expert systems.
- 8. List three real time expert systems.
- 9. Write a short note on Traditional systems.
- 10. Explain blackboard systems.

SECTION - B

Answer any Five of the following questions. Each question carries equal marks.

(5×12=60)

- 11. Explain various approaches to knowledge representation.
 - 12. Illustrate and explain semantic networks.
 - 13. Explain Logic programming.
 - 14. Give a detailed note on Control Knowledge.
 - 15. Write a detailed note on language models.
 - 16. Explain machine translation with examples.
 - 17. Explain characteristic features of expert system.
 - 18. List and explain applications of expert systems.
 - 19. Explain various phases of building an expert system.
 - 20. Discuss rule based expert systems in detail.
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**FOUR YEAR (HONOURS) B.C.A. (DATA SCIENCE / ARTIFICIAL
INTELLIGENCE / BIG DATA / CLOUD COMPUTING / GENERAL)
DEGREE EXAMINATION, DECEMBER - 2024**

CHOICE BASED CREDIT SYSTEM

THIRD SEMESTER - MAJOR

PART : II

PAPER - 6 : MATHEMATICAL AND STATISTICAL FOUNDATION

(Under CBCS New Regulation w.e.f. the academic year 2024-25)

Time : 3 Hours

Max. Marks : 75

SECTION - A

Answer any Five of the following questions. Each question carries equal marks.

(5×3=15)

1. Define Transpose of matrix. Give one example.

2. If $A = \begin{bmatrix} 0 & 2 & 0 \\ 1 & 0 & 3 \\ 1 & 1 & 2 \end{bmatrix}$ $B = \begin{bmatrix} 1 & 2 & 1 \\ 2 & 1 & 0 \\ 0 & 0 & 3 \end{bmatrix}$ find $2A+3B$. $\rightarrow \begin{bmatrix} 3 & 10 & 3 \\ 8 & 3 & 6 \\ 2 & 2 & 13 \end{bmatrix}$

3. Define Rank of matrix?

4. Find the determinant of the matrix $\begin{bmatrix} 1 & -1 & 2 \\ 3 & 0 & 4 \\ -4 & -2 & 5 \end{bmatrix}$ $\rightarrow (26)$

5. If set $A = \{2, 4, 6, 8, 10, 12\}$, $B = \{2, 6, 8, 12, 15, 18\}$ then find a) $A-B$ b) $A+B$. $\rightarrow (4, 10, 15, 18)$

6. In a class of 100 students, 50 play hockey, 34 play basketball, and 14 play both. How many students do not play either of the games? (2) $\rightarrow (24, 6, 8, 10, 12, 15, 18)$

7. What is meant by classification? $\rightarrow$ simple one A $\rightarrow$ manifold more than one A

8. What are grouped data and ungrouped frequency distributions?

9. The mean of marks in statistics of 100 students in a class was 72. The mean of marks boys was 75, while their number was 70. Find out the mean marks of girls in the class.
10. Find mean and median, mode from the following data of the heights in inches of a group of students

61, 62, 63, 61, 63, 64, 64, 60, 65, 63, 64, 65, 66, 64.

mean (63.5)

mode (64)

median (63.5)

(63)

SECTION - B

Answer any Five questions. Each questions carries equal marks.

(5×12=60)

11. If $A = \begin{bmatrix} 1 & -2 & 3 \\ 2 & 3 & -1 \\ -3 & 1 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & 2 \\ 1 & 2 & 0 \end{bmatrix}$ from the products AB and BA, and show that $AB \neq BA$.

$$\begin{bmatrix} 4 & 4 & 2 \\ 1 & 1 & 10 \\ -1 & 5 & -11 \end{bmatrix} \neq \begin{bmatrix} -5 & 0 & 7 \\ -11 & 6 & 3 \\ 3 & 4 & 1 \end{bmatrix}$$

12. If $A = \begin{bmatrix} 1 & 4 & 7 \\ 2 & 5 & 8 \end{bmatrix}$, $B = \begin{bmatrix} -3 & 4 & 0 \\ 4 & -2 & -1 \end{bmatrix}$ verify a) $(A^T)^T$ b) $(A+B)^T = A^T + B^T$

c) $(5B)^T = 5B^T$.

13. Solve the following linear equations by using cramer's rule

$$3x + 4y + 5z = 18; 2x - y + 8z = 13; 5x - 2y + 7z = 20.$$

$$(40/2204) \quad (136/2 \quad 68) \quad (")$$

14. Solve the following linear equations by using Matrix inversion method

$$x + y + z = 1; 2x + 2y + 3z = 6; x + 4y + 9z = 3.$$

$$(7-10 \quad 4)$$

15. In a group of 300 students, 216 students study Hindi and 129 study Punjabi. How many study Hindi only? How many study Punjabi only and how many study both Hindi & Punjabi?
16. Let $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$, $A = \{3, 4, 5\}$, $B = \{4, 5, 6\}$. Show that $(A \cup B)^c = A^c \cap B^c$.

17. The marks scored by 40 candidates in an examination (out of 100) is given below 75, 65, 57, 50, 32, 54, 75, 67, 75, 88, 80, 42, 40, 41, 34, 78, 43, 61, 42, 46, 68, 52, 43, 49, 59, 49, 67, 34, 33, 87, 97, 47, 46, 54, 48, 45, 51, 47, 41, 43.

Prepare a frequency table with the class size 10. Take the class intervals (30-39), (40-49)..... and the following questions.

- a) Which class intervals have the highest and lowest frequency? 16, 1 (40-49) (90-99)
- b) Write the upper and lower limits of the class interval 30-39? 34, 32 (30) (39)

18. Two dice are thrown at random. Obtain the frequency distribution of the sum of the numbers which appear on them.

19. 100 students appeared for an examination. The results of those who failed are given below:

Marks : 5 10 15 20 25 30

Total No. of Students : 4 6 8 7 3 2

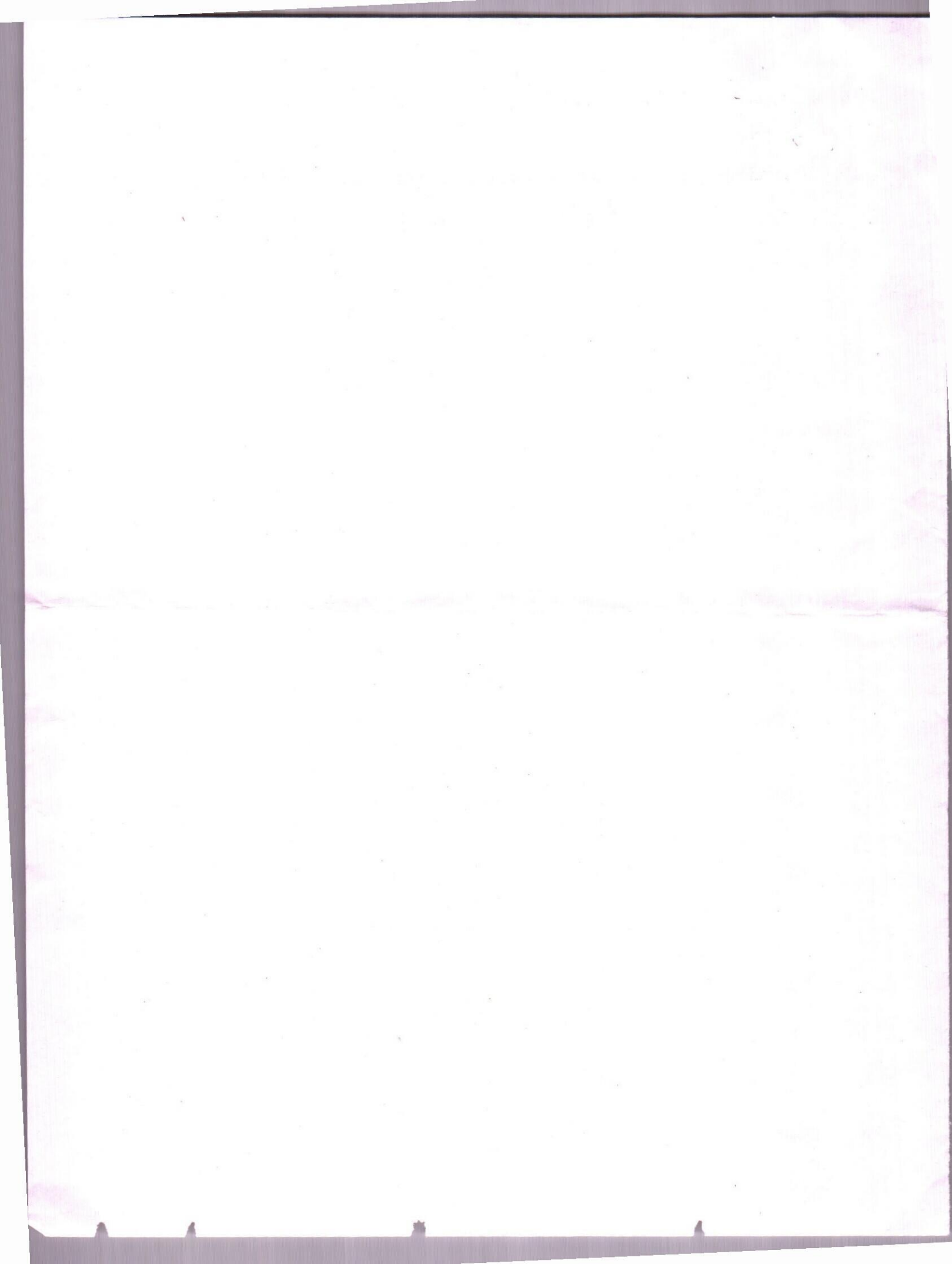
If the average marks of all students were 68.6, find out average marks of those who passed.

• 20. The frequency distribution of weight in grams of mangoes of a given variety is given below. Calculate the arithmetic mean and the median. $\rightarrow (65.5)$

Weight in grams: 410-419 420-429 430-439 440-449 450-459 460-469 470-479

Number : 14 20 42 54 45 18 7

of managoes



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DEGREE EXAMINATION, DECEMBER - 2024**

CHOICE BASED CREDIT SYSTEM

THIRD SEMESTER-MAJOR

PART - II

PAPER-7 : JAVA AND DATA STRUCTURES

(Under CBGS New Regulation w.e.f. the Academic Year 2024-25)

Time : 3 Hours

Max. Marks : 75

SECTION -A

Answer any Five of the Following questions. Each question carries equal marks.

(5×3=15)

- 1. What are the benefits of OOPs.
- 2. Discuss Java Tokens.
- 3. Define Object with real examples.
- 4. Give a short note on this keyword.
5. Compare and contrast error vs exception.
6. Write a short note on Finally statement.
7. What are the benefits of using Data Structures?
8. List five (5) sorting algorithms.
- 9. Give a short note on Binary Search Trees.
- 10. List significant applications of Graphs.

SECTION - B

Answer any Five of the following questions. Each question carries equal marks.

(5×12=60)

11. Explain Object oriented concepts with examples and illustrations.

12. Describe Java Datatypes in detail.

13. Explain method Overloading with coding examples.

14. Explain the process of Implementing an Interface.

15. Describe the process of creating and implementing a package.

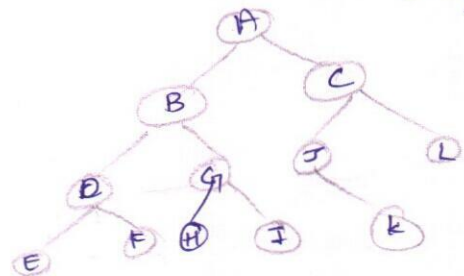
16. Explain Java Applet with coding examples

17. Explain Quick Sort with example.

18. Illustrate and explain linked list with their operations.

19. Explain and illustrate tree traversal methods.

20. Describe the process of traversing a Graph.



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**FOUR YEAR B.C.A. (HONOURS) (DATA SCIENCE/ARTIFICIAL
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DEGREE EXAMINATION, DECEMBER - 2024**

CHOICE BASED CREDIT SYSTEM

THIRD SEMESTER

PART - II

Paper-5: Data Base Management System

(Under CBCS New Regulation w.e.f. the Academic Year 2024-25)

Time : 3 Hours

Max. Marks : 75

SECTION - A

Answer any Five of the following questions. Each question carries equal marks.

(5×3=15)

1. Discuss limitations of File Based Systems.
2. Write a short note on Database Schema.
3. Write a short note on Primary key with examples.
4. Give a simple understanding about Functional Dependency.
5. Write a short note on Specialization.
6. Illustrate aggregation with real examples.
7. Explain Integrity constraint with examples.
8. Give a short note on DCL Commands.
9. Give the syntax of PLSQL procedure.
10. Give a short note on Triggers.

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SECTION - B

Answer any Five of the following questions. Each question carries equal marks.

(5×12=60)

- ~~11.~~ Explain 3Tier Database Architecture.
 - ~~12.~~ Discuss the roles of various Database Users.
 - 13. Illustrate and explain Relational Model.
 - ~~14.~~ Compare and contrast 3NF with BCNF.
 - ~~15.~~ Illustrate and explain ER Model.
 - ~~16.~~ Enumerate and explain DDL commands in detail.
 - 17. Enumerate and explain SQL built-in functions with examples.
 - ~~18.~~ Describe relational set operators with examples.
 - 19. Explain PLSQL program structure.
 - 20. Explain a PLSQL cursor with an example.
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**FOUR YEAR B.A./B.Com/B.Sc./B.C.A/B.B.A/B.Music/B.Dance/B.A(O.L)/
B.H.M/B.VOCATIONAL IN DAIRYING AND ANIMAL
HUSBANDRY/B.VOCATIONAL IN HORTICULTURE**

(ALL GROUPS) DEGREE EXAMINATION, DECEMBER - 2024

CHOICE BASED CREDIT SYSTEM

THIRD SEMESTER

PART- I(C) : LIFE SKILL COURSE

PAPER-III: Information and Communication Technology

(Under CBCS New Regulation w.e.f. the academic year 2024-25)

Time : 1½ Hours

Max. Marks : 50

Answer any Five questions. Each question carries equal marks.

(5×10=50)

1. Compare and contrast different types of web browsers.
2. Explain the concept of URL and its components.
3. Define the Internet and explain its significance in modern communication.
4. What is email? Discuss its advantages and disadvantages.
5. Provide an overview of G-Suite tools such as Google Docs, Sheets.
6. Discuss the various threats to Email security.
7. What is a firewall, and how does it function to protect networks?
8. Explain the concept of Digital Signature.
9. What are the types of cryptographic techniques? Explain.
10. Discuss the process of composing an Email.

FOUR YEAR B.SC. (HONOURS) DEGREE EXAMINATION,
DECEMBER - 2024
CHOICE BASED CREDIT SYSTEM
THIRD SEMESTER - MAJOR
PART - II : ELECTRONIC
PAPER - 5 : SEMICONDUCTOR DEVICES AND MATERIALS
(Under CBCS New Regulation w.e.f. the academic year 2024-25)

Time : 3 Hours

Max. Marks : 75

SECTION -A

Answer any Five of the following questions. Each question carries equal marks.

(5×5=25)

1. Draw Energy band diagram of a semiconductor and define valence band and conduction band.
2. What is Mobility in Semi conductor?
3. What are Rectifying and non-rectifying contacts?
4. Explain the full form of MESFET and HEMT.
5. What is Ideal MOS Capacitor?
6. What is VLSI? Mention it application?
7. What is memory ? Explain the Nonvolatile Memory.
8. What is Nano structure?
9. What is BJT? Draw the symbol of BJT?
10. What are the disadvantages of transformer coupling in amplifiers?

SECTION B

Answer All questions. Each question carries equal marks.

(5×10=50)

11. a) Discuss the concepts drift and diffusion of carriers in semiconductors.
(OR)
- b) What is high field effect? Explain briefly.
12. a) Describe the structure of a Metal-Insulator-Semiconductor (MIS) device.
(OR)

- b) What is a Metal-Semiconductor Field-Effect Transistor (MESFET) and how does it operate?

13. a) Explain the Structure and Characteristics of depletion type MOSFET.

(OR)

b) Describe the effects of oxide charges and defects and interface on the operation of MOS capacitor.

14. a) Describe the working principles of Light-Emitting Diodes (LEDs), with neat sketch?

(OR)

b) Explore the potential and challenges of carbon nanotubes (CNTs) and 2D materials.

15. a) Describe the basic operation of an RC coupled amplifier briefly.

(OR)

b) What is Multistage Amplifier? Explain the BJT at high frequency?

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B.H.M/B.VOCATIONAL IN DAIRYING AND ANIMAL
HUSBANDRY/B.VOCATIONAL IN HORTICULTURE**

(ALL GROUPS) DEGREE EXAMINATION, DECEMBER-2024

CHOICE BASED CREDIT SYSTEM

THIRD SEMESTER

PART - I(D) : MULTIDISCIPLINARY COURSE

PAPER-IV: HEALTH AND HYGIENE

(Under CBCS New Regulation w.e.f. the academic year 2024-25)

Time : 1½ Hours

Max. Marks : 50

Answer any Five questions. Each question carries equal marks.

(5×10=50)

1. What is nutrition, and why is it important? Explain the difference between good nutrition and malnutrition.
2. Describe what a balanced diet is and outline the basics of planning a meal.
3. Define carbohydrate. Explain its functions and enlist sources of carbohydrates.
4. Define hygiene and explain the different types; personal, community, medical and culinary hygiene.
5. What is the WASH program? Describe its significance in promoting health.
6. Explain the roles of following nutrition and health organizations in India:
a) NIN and b) ICMR.
7. Discuss the importance of environmental sanitation and sanitation in public places for community and personal hygiene.
8. Discuss the National Health Policy of India 2017 and its key health indicators.
9. Describe the principles and strategies of health education. Why is it important?
10. How does the Indian government manage disasters, epidemics, and pandemics? What are the acts, guidelines, and the roles of government and public in these situations?