K25U 0929

Reg. No. : .....

Name : .....

IV Semester B.C.A. Degree (C.B.C.S.S. – O.B.E. – Regular/Supplementary/ Improvement) Examination, April 2025
(2019 to 2023 Admissions)
GENERAL AWARENESS COURSE
4A14BCA : Discrete Mathematical Structures

Time : 3 Hours Max. Marks : 40

PART – A
(Short Answer)

Answer **all** questions. **(6×1=6)**

1. Define a bijective function.
2. Draw a Venn diagram for $A \cap B$.
3. Define a graph.
4. What is a path in graph theory ?
5. What is an incidence matrix ?
6. Define equivalence relation with an example.

PART – B
(Short Essay)

Answer **any 6** questions. **(6×2=12)**

7. What are tautologies ? Give an example.
8. Compare surjective and injective functions.
9. Define an equivalence relation.
10. Explain reflexive closure with example.
11. Prove $A + A'B = A + B$ using Boolean algebra.

P.T.O.

12. Differentiate between sum-of-products (SOP) and product-of-sums (POS).
13. Define an isomorphic graph.
14. Explain trees in graph theory.

PART – C
(Essay)

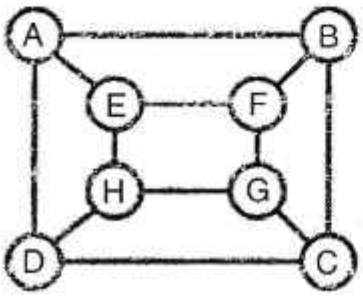
Answer **any 4** questions. **(4×3=12)**

15. Explain the rules of inference with an example.
16. Discuss the applications of set theory in computer science.
17. Explain function composition and properties.
18. Explain minimization using K-maps.
19. Explain Hamiltonian paths and circuits.
20. What is a planar graph ? Explain the concept of planarity testing in graphs.

PART – D
(Long Essay)

Answer **any 2** questions. **(2×5=10)**

21. Explain Hasse diagram construction.
22. Minimize the Boolean function $F(w, x, y, z) = \sum m(0, 1, 3, 4, 5, 7, 8, 9, 11, 12, 13, 14, 15)$.
23. Explain the Traveling Salesman Problem (TSP).
24. Identify Hamiltonian path and Hamiltonian circuit, if exist. If not, explain the reason.



K25U 0930

Reg. No. : .....

Name : .....

IV Semester B.C.A. Degree (C.B.C.S.S. – O.B.E. – Regular/Supplementary/ Improvement) Examination, April 2025
(2019 to 2023 Admissions)
Core Course
4B08BCA : SOFTWARE ENGINEERING

Time : 3 Hours Max. Marks : 40

PART – A
(Short Answer)

Answer **all** questions. **(6×1=6)**

1. What is software development life cycle ?
2. Define software product.
3. What are the different types of requirements in software engineering ?
4. What is the purpose of function-oriented design ?
5. Define object-oriented analysis.
6. What is alpha testing ?

PART – B
(Short Essay)

Answer **any 6** questions. **(6×2=12)**

7. Explain the importance of software characteristics.
8. Differentiate between functional and non-functional requirements.
9. What is feasibility study ? Explain briefly.
10. Describe the advantages of modularity in software design.

P.T.O.

11. What is the significance of object-oriented design methodologies ?
12. Differentiate between validation and verification in software testing.
13. Explain the concept of decision table-based testing.
14. What are the key steps in system testing ?

PART – C
(Essay)

Answer **any 4** questions. **(4×3=12)**

15. Compare the incremental and spiral models.
16. Explain the different types of requirement gathering techniques.
17. What are the key components of software design documentation ?
18. Explain different object-oriented design notations.
19. What are the different types of software testing techniques ?
20. Explain data flow testing with an example.

PART – D
(Long Essay)

Answer **any 2** questions. **(2×5=10)**

21. Explain different software process models with their advantages and disadvantages.
22. Describe the various steps involved in requirement engineering.
23. Explain function-oriented vs object-oriented design approaches with examples.
24. Discuss different levels of software testing with examples.

K25U 0931

Reg. No. : .....

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IV Semester B.C.A. Degree (C.B.C.S.S. – OBE-Regular/Supplementary/ Improvement) Examination, April 2025
(2019 to 2023 Admissions)
Core Course
4B09BCA : COMPUTER ORGANIZATION

Time : 3 Hours Max. Marks : 40

PART – A
(Short Answer)

Answer **all** questions. (6×1=6)

1. What do you mean by micro-operations ?
2. List various computer registers.
3. What do you mean by DMA ?
4. Explain the term associative memory.
5. What do you mean by instruction-level parallelism ?
6. What is the difference between point-to-point and multipoint interconnection structures ?

PART – B
(Short Essay)

Answer **any 6** questions. (6×2=12)

7. What do you mean by instruction cycle ?
8. Compare RISC and CISC architectures.
9. Elaborate the concept of serial communication.
10. Short note on I/O interfaces.
11. Short note on various modes of data transfer.

P.T.O.

12. Compare SRAM and DRAM.
13. Mention few characteristics of cache memory.
14. What do you mean by associative memory ?

PART – C
(Essay)

Answer **any 4** questions. (4×3=12)

15. Write short notes on instruction codes.
16. What are the different types of instruction formats ?
17. Explain the concept of synchronous data transfer.
18. Write short note on cache memory.
19. Write notes on multiprocessors.
20. Explain the concepts of SIMD and MIMD architecture.

PART – D
(Long Essay)

Answer **any 2** questions. (2×5=10)

21. Describe the different types of addressing modes in a processor.
22. Describe various types of parallel processing and their advantages.
23. Explain the concepts of serial communication.
24. Briefly explain about virtual memory.

K25U 0932

Reg. No. : .....

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IV Semester B.C.A. Degree (C.B.C.S.S. – O.B.E. – Regular/Supplementary/ Improvement) Examination, April 2025
(2019 to 2023 Admissions)
Core Course
4B10BCA : LINUX ADMINISTRATION

Time : 3 Hours Max. Marks : 40

PART – A
(Short Answer)

Answer **all** questions. **(6×1=6)**

1. What is meant by 'open source' OS ?
2. All the information of users in a system is stored in _____ file in etc folder.
3. Name the command used to change file permission in Linux.
4. Enter into Command Mode from any other mode, requires pressing the _____ key.
5. Comments in shell script can be included using _____ symbol.
6. _____ mode in vi editor enables you to insert text into the file.

PART – B
(Short Essay)

Answer **any 6** questions. **(6×2=12)**

7. What are the benefits of using free software ?
8. What is meant by input and output redirection ? Give an example.
9. What is lilo.conf file ?
10. Describe the components of a shell script.
11. What are the options available in mount command in Linux ?
12. Describe GRUB file.
13. What is meant by disk partitioning in Linux ?
14. What is meant by differential back up in Linux ?

P.T.O.

PART – C
(Essay)

Answer **any 4** questions. **(4×3=12)**

15. What are the categories of users in Linux ? Explain the actions taken when a new user is created
    a) by the system
    b) by default.
16. List the commands used to delete characters and lines from a file.
17. Explain commands to save and exit in Vi editor in Linux.
18. Describe case command in shell scripting.
19. Explain the following three services in Linux system.
    a) Init
    b) Logins from terminals
    c) Syslog.
20. Explain the working of tmpwatch command.

PART – D
(Long Essay)

Answer **any 2** questions. **(2×5=10)**

21. Explain the commands to
    a) Creating directories.
    b) Copying files.
    c) Moving files.
    d) Removing files and directories.
22. Define infinite loops and various loop control commands used in shell scripting.
23. Explain seven runlevels supported by standard Linux kernel.
24. Explain basic steps involved in mounting a file system in Linux.

K25U 0836

Reg. No. : .....

Name : .....

IV Semester B.Sc. Degree (C.B.C.S.S. – OBE-Regular/Supplementary/ Improvement) Examination, April 2025
(2019 to 2023 Admissions)
COMPLEMENTARY ELECTIVE COURSE IN MATHEMATICS
4C04MAT-BCA : Mathematics for BCA – IV

Time : 3 Hours Max. Marks : 40

SECTION – A

Answer **any four** questions. **Each** question carries 1 mark **each**. **(4×1=4)**

1. State the principle of counting.
2. Prove that $nC_r = nC_{n-r}$.
3. State the Trapezoidal rule for Numerical Integration.
4. Define the term 'decision variable' in connection with an LPP.
5. Write any one basic assumption that is necessary for a LPP.

SECTION – B

Answer **any seven** questions from the following. **Each** question carries **2** marks.
(7×2=14)

6. State the Empirical definition of Probability.
7. What is the chance that a non leap year selected at random will contain 53 Sundays ?
8. Write the standard form of the following LPP.
   Maximize $z = 3x_1 + 2x_2$
   Subject to the constraints : $x_1 \leq 2, x_1 - x_2 \leq 3, x_1 \geq 0, x_2 \geq 0$.

P.T.O.

9. Define the following terms :
   i) slack
   ii) surplus
10. Write any two advantages of Simpson's 1/3 rule.
11. Write Runge-Kutta fourth order formula.
12. Write the sample space corresponding to the random experiment of tossing two coins simultaneously.
13. Briefly explain the shortest route problem.
14. What is the significance of the feasible region in a Linear Programming Problem ?
15. Define cycles.

SECTION – C

Answer **any four** questions. **Each** question carries **3** marks. (4×3=12)

16. A coin is tossed four times. Find the probability of getting
    i) Exactly one head ii) At least one head.
17. Find the number of words formed from the letters of the word 'STATISTICS'. Also find how many of them start with 'S' and end with 'S'.
18. Use graphical method to solve the following LPP.
    Maximize $z = 3x_1 - 2x_2$
    Subject to the constraints : $x_1 + x_2 \leq 2$, $2x_1 + x_2 \leq 2$, $x_1 \geq 0$, $x_2 \geq 0$.
19. Use Modified Euler's method to solve $\frac{dy}{dx} = x + y$ for $x = 0.75$ and $h = 0.25$ with the boundary condition $y = 2$ when $x = 0$.
20. Use Euler's method to approximate y when $x = 0.1$ given that $\frac{dy}{dx} = \frac{y-2x}{y+2x}$ with $y = 2$ for $x = 0$ (Take $h = 0.025$).

21. Apply Simpson's one third rule to evaluate $\int_0^4 \frac{1}{1+x^2} dx$ with h = 1.

22. Evaluate $\int_1^5 \frac{1}{1+x^2} dx$ using Trapezoidal rule.

SECTION – D

Answer **any two** questions. **Each** question carries 5 marks. **(2×5=10)**

23. A four digit number is formed by the digits 0, 3, 8, 5 without repetition. Find the probability that the number formed is divisible by 2 or by 5.

24. Use Simplex method to solve the following LPP.

    Maximize $z = 3x_1 + 4x_2$

    Subject to the constraints : $2x_1 + 3x_2 \leq 12$, $3x_1 + 2x_2 \leq 12$,

    $x_1 \geq 0$, $x_2 \geq 0$.

25. Use Taylor series method to find y for x = 0.1 correct to four decimal places, if y satisfies $\frac{dy}{dx} = y + x^2$ with $y_0 = 2$, $x_0 = 0$.

26. Use Dijikstra's algorithm to determine a shortest path from A to G for the following network.