

Roll No.

ID-2862

B. C. A. (Part II)
EXAMINATION, March-April, 2025

Paper First
NUMERICAL ANALYSIS

Time : Three Hours

Maximum Marks : 80

Minimum Pass Marks : 27

Note : Attempt any *two* parts from each question. All questions carry equal marks.

Unit—I

1. (a) Find the root of the equation $x^3 - x - 4 = 0$ using the Bisection method.
- (b) Find a real root of the equation $x^3 - 2x - 5 = 0$ using Regula-Falsi method.
- (c) Use Newton-Raphson method to find a root of the equation $x^2 - 5x + 2 = 0$ correct to five decimal places.

P. T. O.

Unit—II

2. (a) Solve the following system of equations :

$$2x_1 - x_2 + x_3 = 7$$

$$-x_1 + 2x_2 - x_3 = 1$$

$$x_1 - x_2 + 2x_3 = 1$$

using the Gauss-Seidal method and its error format. Take the initial approximation as

$x^{(0)} = [0, 0, 0]^T$ and perform three iterations.

- (b) Factorise the matrix :

$$A = \begin{bmatrix} -2 & 4 & 8 \\ -4 & 18 & -16 \\ -6 & 2 & -20 \end{bmatrix}$$

in the form LU, where L is the units lower triangular matrix and U is the upper triangular matrix.

- (c) Solve the system of linear equations :

$$\begin{bmatrix} 2 & -1 & 0 & 0 \\ -1 & 2 & -1 & 0 \\ 0 & -1 & 2 & -1 \\ 0 & 0 & -1 & 1 \end{bmatrix}$$

using Thomas algorithm.

Unit—III

3. (a) Obtain the cubic spline approximation for the function defined by the following data :

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x	$f(x)$
0	1
1	2
2	33
3	244

- (b) Obtain the estimate of the missing figures in the following table :

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x	y
2.0	0.135
2.1	?
2.2	0.111
2.3	0.100
2.4	?
2.5	0.082
2.6	0.74

- (c) Show that Newton-Gregory's interpolation formula can be put in the form :

$$u_x = u_0 + x\Delta u_0 - x\dot{a}\Delta^2 u_0 + xab\Delta^3 u_0 - xabc\Delta^4 u_0 + \dots$$

where $a = 1 - \frac{1}{2}(x+1)$, $b = 1 - \frac{1}{3}(x+1)$

$c = 1 - \frac{1}{4}(x+1)$ etc.

Unit—IV

4. (a) Find $f'(10)$ from the following data :

x	$f(x)$
3	-13
5	23
11	899
27	17315
34	35606

- (b) Evaluate $\int_0^1 \frac{dx}{1+x^2}$ by using Simpson's $\frac{1}{3}$ rule,

taking $h = \frac{1}{6}$. Hence obtain the approximate value of π .

- (c) Use Trapezoidal rule to evaluate the approximate value of $\int_1^7 f(x) dx$.

Given that :

x	$f(x)$
1	2.105
2	2.808
3	3.614
4	4.604
5	5.857
6	7.451
7	9.467

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Unit—V

5. (a) Use Runge-Kutta method to solve $y' = xy$ for u^{06} $x = 1.4$ initially $x = 1, y = 2$ (take $h = 0.2$).

- (b) Given $\frac{dy}{dx} = x - y^2$ and $y(0) = 0, y(0.2) = 0.0200, y(0.4) = 0.0795, y(0.6) = 0.1762$; evaluate, $y(0.8)$.

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- (c) Discuss the methods of Weather Forecasting.

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B. C. A. (Part II)

EXAMINATION, March-April, 2025

Paper Second

OPERATING SYSTEM

Time : Three Hours

Maximum Marks : 80

Minimum Pass Marks : 27

Note : Answer any *two* parts from each question. All questions carry equal marks.

Unit—I

- (a) What is an operating system ? Explain its evolution.
- (b) Describe the types of operating systems for personal computer.
- (c) What do you mean by Resource Abstraction ? Explain in detail.

P. T. O.

Unit—II

2. (a) What is kernel in operating system ? Describe in brief.
- (b) What do you mean by process scheduling ? Explain its types.
- (c) Explain the types of thread in operating system.

Unit—III

3. (a) What do you mean by deadlock ? How does deadlock occur in the operating system ?
- (b) Describe the deadlock prevention and avoidance.
- (c) What do you mean by Semaphores ? Explain its work in brief.

Unit—IV

4. (a) Describe the memory management technique in detail.
- (b) Explain the virtual memory in operating system.
- (c) Write the difference between paging and segmentation.

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Unit—V

5. (a) Describe the Android operating system with a suitable diagram.
- (b) Explain the Android application architecture.
- (c) Define Android File System. Explain in detail.

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B. C. A. (Part II)

EXAMINATION, March-April, 2025

Paper Third

**RELATIONAL DATABASE MANAGEMENT
SYSTEM**

Time : Three Hours

Maximum Marks : 80

Minimum Pass Marks : 27

Note : Answer any *two* parts from each question. All questions carry equal marks.

Unit—I

1. (a) Define Data Independence. Write the role of DBA.
- (b) Define data dictionary and discuss various data models in detail.

P. T. O.

- (c) Write short notes on the following :
- (i) Set operations
 - (ii) Drop and Alter
 - (iii) Queries on multiple relations

Unit—II

2. (a) Define Entity and Attributes and its types. Discuss constraints in database.
- (b) Describe the symbols and implementation in E-R diagram. Write about E-R modelling specification.
- (c) Write about the concepts of key in database and extended ER features.

Unit—III

3. (a) Discuss Normalization concept in logical model and pitfalls in database design.
- (b) Write about Boyce-Codd Normal Form, Decomposition and Multivalued dependencies.
- (c) What is Join Operation ? Write about Natural Join, Inner Join, Outer Join and Self Join.

Unit—IV

4. (a) Write about Microsoft SQL server 2019, its version installation process and SSMS.

- (b) Discuss AZURE data studio; features of SQL server express, SQL server support life cycle.
- (c) Describe Data definition language, Data manipulation language, Data control language and Data constraints.

Unit—V

5. (a) Discuss Oracle client and server products, Online transaction processing and Hybrid Cloud Installation.
- (b) Explain the basics of PL/SQL programming with example.
- (c) Write about stored procedure, functions and cursors in PL/SQL.

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B. C. A. (Part II)

EXAMINATION, March-April, 2025

Paper Fourth

**COMPUTER NETWORKING AND
CYBER TECHNOLOGY**

Time : Three Hours

Maximum Marks : 80

Minimum Pass Marks : 27

Note : Answer any *two* parts from each question. All questions carry equal marks.

Unit—I

1. (a) Compare and contrast circuit switching, message-switching and packet switching.
- (b) Explain computer network and its types, along with comparative chart of LAN, WAN and MAN.

P. T. O.

- (c) Explain the OSI and TCP/IP models in detail, comparing their layers and functionalities.

Unit—II

2. (a) Explain error detection and correction technique. What is CRC ? Explain with the help of an example.
- (b) Compare IEEE 802.3, 802.4 and 802.5 in terms of transmission and access methods.
- (c) Explain the role of medium access control sub-layer. How does it help in data transmission ?

Unit—III

3. (a) What is routing ? Explain distance vector routing algorithm.
- (b) Compare IPv4 and IPv6 addressing.
- (c) Explain the functions of transport layer in network communication. How does it ensure end-to-end communication ?

Unit—IV

4. (a) Explain the working principles of X.25 and ATM networks.

- (b) Explain connection oriented and connectionless networks with their advantages and disadvantages.
- (c) What is VSAT ? Explain its importance in satellite communication.

Unit—V

5. (a) Explain the working of World Wide Web (WWW).
- (b) Explain e-mail protocol SMTP and POP in detail.
- (c) What is cyber offense ? Explain with example. How are they addressed under Indian cyber laws.

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B. C. A. (Part II)

EXAMINATION, March-April, 2025

Paper Fifth

WEB TECHNOLOGY

Time : Three Hours

Maximum Marks : 80

Minimum Pass Marks : 27

Note : Answer any *two* parts from each question. All questions carry equal marks.

Unit—I

1. (a) What is webpage and website ? Explain web development strategies.
- (b) Explain domain name registration with example.
- (c) Write short notes on the following :
 - (i) Testing Website
 - (ii) Web Publishing

P. T. O.

Unit—II

2. (a) What is HTML ? Explain basic formatting tags.
- (b) What is List ? Explain ordered and unordered list with example.
- (c) Write HTML program for checkbox and radio button.

Unit—III

3. (a) What is an array ? Explain the types of array in JavaScript with example.
- (b) What is style sheet ? Why do we use style sheet ? Explain it.
- (c) Write a program to check a number is prime or not using JavaScript.

Unit—IV

4. (a) Explain logical and comparison operator with example in PHP.
- (b) Explain constructor and destructor in PHP.
- (c) Discuss HTTP GET and POST method.

[3]

Unit—V

5. (a) What is database ? Discuss the various features of MySQL.
- (b) Discuss SELECT, DELETE and UPDATE commands in MySQL.
- (c) Explain various PHP functions for MySQL operations.

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B. C. A. (Part II)

EXAMINATION, March-April, 2025

FOUNDATION COURSE

(Hindi Language)

Time : Three Hours

Maximum Marks : 75

Minimum Pass Marks : 26

नोट : सभी प्रश्नों के उत्तर दीजिए। सभी प्रश्नों के अंक उनके दाहिनी ओर अंकित हैं।

इकाई—I

1. (क) मनुष्य बार-बार नाखूनों को क्यों काटता है ? 8

अथवा

बढ़ते नाखूनों द्वारा प्रकृति मनुष्य को क्या याद दिलाती है ?

P. T. O.

- (ख) प्रिंट मीडिया और इलेक्ट्रॉनिक मीडिया में अंतर स्पष्ट कीजिए। 7

अथवा

वित्त एवं वाणिज्य की भाषा पर प्रकाश डालिए।

इकाई—II

2. (क) आचार्य नरेन्द्र देव का परिचय देते हुए भारतीय समाज के निर्माण में उनके योगदान को रेखांकित कीजिए। 8

अथवा

‘युवकों का समाज में स्थान’ निबंध का सारांश अपने शब्दों में लिखिए।

- (ख) देशज और विदेशज शब्द किन्हें कहते हैं ? उदाहरण दीजिए। 7

अथवा

विकारी और अविकारी शब्दों से क्या तात्पर्य है ? इनके प्रमुख प्रकारों का वर्णन कीजिए।

इकाई—III

3. (क) “डॉ. खूबचंद बघेल छत्तीसगढ़ की माटी की मोहक सुगंध थे।” इस कथन की पुष्टि कीजिए। 8

अथवा

“डॉ. खूबचंद बघेल एक राजनेता होने के साथ ही समाज सुधारक थे।” इस कथन की व्याख्या कीजिए।

- (ख) क्रियाविशेषण को परिभाषित कीजिए एवं इसके प्रकारों का उल्लेख कीजिए। 7

अथवा

गुणवाचक विशेषण किसे कहते हैं ? इसके प्रमुख रूपों को उदाहरण सहित समझाइए।

इकाई—IV

4. (क) ‘एक पहाड़ी मैना की मौत’ संस्मरणात्मक आलेख का सार अपने शब्दों में लिखिए। 8

अथवा

‘एक पहाड़ी मैना की मौत’ पाठ में लेखक ने पहाड़ी मैना की कौन-कौन सी विशेषताओं के बारे में चर्चा की है ? लिखिए।

(ख) संधि किसे कहते हैं ? स्वर संधि के प्रमुख प्रकारों को उदाहरण सहित लिखिए। 7

अथवा

संधि और समास में अंतर स्पष्ट कीजिए।

इकाई—V

5. (क) वासुदेवशरण अग्रवाल का साहित्यिक परिचय लिखिए। 8

अथवा

‘मातृभूमि’ के संबंध में वासुदेवशरण अग्रवाल के विचारों की समीक्षा कीजिए।

(ख) अनुवाद के स्वरूप और उद्देश्य पर प्रकाश डालिए। 7

अथवा

अनुवाद करते समय किन-किन बातों का विशेष ध्यान रखना चाहिए ?

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