Reg. No. | | | | | | | | | |

BCACAC 260

# Credit Based Fourth Semester B.C.A. Degree Examination, May/June 2016
## (New Syllabus) (2013-14 Batch Onwards)
## COMPUTER GRAPHICS AND MULTIMEDIA

Time : 3 Hours Max. Marks : 80

***Note :*** *Answer* ***any ten*** *questions from Part – **A** and* ***any one full*** *question from* ***each*** *Unit in Part – **B**.*

PART – A

**(10×2=20)**

1. a) What are horizontal and vertical retrace ?
   b) Define aspect ratio.
   c) Expand GKS and PHIGS.
   d) Draw 8-connected and 4-connected pixels.
   e) List any four character attributes.
   f) What is a rigid body transformation ? Give example.
   g) Write matrices to represent rotation and scaling in homogeneous co-ordinate system.
   h) What is interactive media ?
   i) What is morphing ?
   j) List the components of MIDI envelop.
   k) What is 2-D animation ?
   l) What is overscan and underscan ?

PART – B

**Unit – I**

2. a) Explain the architecture of Vector display system with neat diagram.
   b) Write DDA line drawing algorithm.
   c) Write a note on flood fill algorithm. **(5+5+5)**

**P.T.O.**

3. a) Derive Mid-point algorithm to draw an ellipse.
   b) Write a note on graphics standards. (10+5)

## Unit – II

4. a) Explain general pivot-point rotation with a suitable diagram. Derive the composite matrix for the same.
   b) Explain curve attributes in detail.
   c) Write an explanatory note on homogeneous co-ordinate system. (6+5+4)

5. a) Explain the procedure of Sutherland-Hodgeman polygon clipping along with suitable diagrams.
   b) List the various basic 2-dimensional transformations and explain any one in detail.
   c) Write a note on pattern fill. (6+5+4)

## Unit – III

6. a) Write application of multimedia in various fields.
   b) Write any 5 editings in digital recordings.
   c) List the drawbacks of MIDI. (5+5+5)

7. a) List and explain different attributes of font.
   b) Write steps involved to bring an audio recording into multimedia project.
   c) Write a note on bitmaps. (5+5+5)

## Unit – IV

8. a) Give some suggestions for creating good titles for video.
   b) List and explain different types of authoring tools for multimedia.
   c) Write a note on MPEG. (6+5+4)

9. a) Explain how Digital Video is recorded ?
   b) List and explain different stages of a multimedia project.

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BCACAC 261

# Credit Based Fourth Semester B.C.A. Degree Examination, May/June 2016
## VISUAL BASIC .NET PROGRAMMING
## (New Syllabus) (2013-14 Batch Onwards)

Time : 3 Hours Max. Marks : 80

***Note :*** *Answer* ***any ten*** *questions from Part – **A** and* ***one full*** *question from* ***each*** *Unit in Part – **B**.*

PART – A

1. a) List any two IntelliSense options. **(10×2=20)**

   b) Mention the purpose of any two option statements in VB.Net.

   c) How to write comments in VB ? Give example.

   d) Differentiate Checkbox and Radio Button.

   e) Write the purpose of ReadOnly and MaxLength properties of Textbox.

   f) List the uses of Labels.

   g) Write the method to

      i) Add an element to a ListBox.

      ii) Display the total number of elements in a ListBox.

   h) What is Context Menu ? Why it is used ?

   i) What is the use of Image List ? List any two controls that have ImageList property.

   j) Write the purpose of data adapter.

   k) What is a Data Grid ?

   l) What is the use of Server Explorer ?

P.T.O.

## PART – B

### Unit – 1

2. a) Explain the following components of Visual Basic Integrated Development Environment.
   i) Tool Box
   ii) Solution Explorer
   iii) Properties Window.
   b) Explain Do Loop with syntax and example.
   c) Explain structured exception handling in VB.NET with example. (6+4+5

3. a) Write the purpose of following functions in VB.NET
   i) IsArray()
   ii) IsDate()
   iii) IsDBNull()
   iv) IsNumeric()
   v) IsError()
   b) Explain Switch and Choose functions with syntax and example.
   c) Explain structured exception handling with suitable example. (5+4+6

### Unit – 2

4. a) List and explain any 4 unique properties of Textbox.
   b) Write a note on :
   i) Rich Textbox ii) InputBox()
   c) Write a note on handling Mouse Events in VB.NET. (5+5+

5. a) Write a note on :
   i) Handling Keyboard events ii) MDI forms
   b) Write the code for creating TextBox.
   c) Write the uses of Link Labels with code example. (5+5+

## Unit – 3

6. a) List and explain any four methods of ComboBox.

   b) Write the use of

      i) ToolTip

      ii) ProgressBar

      iii) ImageList

      iv) Timer

      v) Notify Icon

   c) Explain any five properties of DateTimePicker. **(5+5+5)**

7. a) Write a note on

      i) Toolbar ii) Tab Control

   b) Explain the use

      i) Splitter

      ii) SaveFile Dialog

      iii) TrackBar

   c) Explain how to determine the items that are checked in a CheckedList box. **(5+6+4)**

## Unit – 4

8. a) What is Data Binding ? Explain different types of data binding in VB.NET.

   b) Explain the following :

      i) Data Reader ii) Data Table iii) Data Row

   c) Explain the properties and methods associated with OleDbDataAdapter objects. **(4+6+5)**

9. a) Write a note on Data views.

   b) Write a note on OleDbConnection class.

   c) Explain the process of creating Data Forms using Data Form Wizard. **(5+5+5)**

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BCACAC 262

# Credit Based IV Semester B.C.A. Degree Examination, May/June 2016
## (New Syllabus) (2013-14 Batch Onwards)
## PRINCIPLES OF TCP/IP

Time : 3 Hours  Max. Marks : 80

***Note** : Answer **any ten** questions from Part – **A** and **one full** question from **each** unit of Part – **B**.*

PART – A

1. a) What is RFC ? **(10×2 = 20)**

   b) What is limited broadcast ?

   c) Expand IAB and ARPANET.

   d) List any two functions of IP.

   e) What are the functions of HELLO protocol ?

   f) What is routing table ?

   g) What is BGP ?

   h) Expand TCP and UDP.

   i) What do you mean by reliable stream delivery ?

   j) What is the use of Rlogin protocol ?

   k) What are the advantages of delayed acknowledgement scheme ?

   l) What is caching ?

P.T.O.

PART – B

## Unit – I

2. a) Explain various classes of IP addressing scheme.
   b) Explain address resolution through direct mapping.
   c) Write a note on cache and ARP timeouts. (6+

3. a) Write a note on internet architecture.
   b) Explain TCP/IP 5 layer reference model.
   c) How RARP work ? Explain. (5+

## Unit – II

4. a) Write IP forwarding algorithm.
   b) Explain subnet addressing with an example.
   c) Explain RIP operation. (5+

5. a) How the datagram can be forwarded using direct delivery ? Explain.
   b) Explain various characteristics of OSPF protocol.
   c) Explain routing with IP addresses. (5+

## Unit – III

6. a) Explain sliding window technique with a diagram.
   b) Explain how TCP establishes connection using 3 way handshake.
   c) Explain various services offered by telnet protocol. (5

7. a) Give UDP message format and explain various fields.
   b) Explain TCP acknowledgement retransmission and timeout.
   c) How application programs are used to implement telnet client and telnet server with a diagram ? (5

## Unit – IV

8. a) Explain FTP process model with diagram.
   b) Explain various characteristics of IP multicasting.
   c) Explain DNS message format fields. (5

9. a) Explain NFS with diagram.
   b) Explain send-side silly window Avoidance.
   c) Write a note on MIME protocol. (5

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BCACAC 263

**Credit Based Fourth Semester B.C.A. Degree Examination, May/June 2016**
**(New Syllabus) (2013 – 14 Batch Onwards)**
**E-COMMERCE**

Time : 3 Hours Max. Marks : 80

***Note** : Answer **any ten** questions from Part – **A** and **one full** question from **each** Unit of Part – **B**.*

PART – A

1. a) Define E-commerce. **(10×2=20)**

b) List the categories of E-commerce business models.

c) What is freeware model ? Give an example.

d) What is EFT ? Give an example.

e) Give any two applications of EDI.

f) Give the general format of URL.

g) What are the services of FTP ?

h) Name the two main components of an e-mail.

i) What is sniffing ?

j) Name the different types of firewalls.

k) What is ALOHA ?

l) Name any two authentication protocols in m-commerce.

P.T.O.

## PART – B

### Unit – I

2. a) Explain B2C electronic commerce with an example.
   b) Explain Advertising model.
   c) What is a brokerage model ? Explain its role in business transaction. (5+

3. a) Explain the benefits of E-commerce.
   b) Explain electronic store model with a diagram.
   c) How does supply chain management take place using e-commerce ? (5+

### Unit – II

4. a) Write a note on Value Added Network.
   b) Explain the architecture of an e-mail system with a neat diagram.
   c) Write a short note on WAN. (5+

5. a) Explain the benefits of EDI.
   b) With a neat diagram explain different steps in typical interaction of an HTTP.
   c) Name any two web servers. (5+

### Unit – III

6. a) Explain ring topology with a neat diagram. Mention its advantages.
   b) Write a short note on transmission media used in LANS.
   c) Why is the internet vulnerable to hackers ? (6+6

7. a) Explain Domain name system.
   b) Explain 10 Base 5 (Thick coaxial cable).
   c) Explain different types of security problems or threats in e-commerce. (6+5

## Unit – IV

8 a) What are the different network services to ensure the security of a message ?

b) Write a note on mondex.

c) Explain the different applications of M-commerce. **(5+5+5)**

9. a) Explain the public key cryptosystem with a diagram.

b) Explain the working of Netbill payment system with a neat diagram.

c) Explain major impediments faced by the mobile commerce environment.

**(5+5+5)**

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BCACAC 264

# Credit Based Fourth Semester B.C.A. Degree Examination, May/June 2016
## (New Syllabus) (2013-14 Batch Onwards)
## COMPUTER ORIENTED NUMERICAL ANALYSIS (Elective – I)

me : 3 Hours Max. Marks : 80

**Note :** a) *Answer* ***any ten*** *questions from Part – **A** and* ***one full*** *question from* ***each*** *Unit of Part – **B**.*
b) *Scientific calculator is* ***allowed.***

PART – A (10×2=20)

1. a) Find the relative error of the number 8.6 if both of its digits are correct.

b) Define Interpolation and Extrapolation.

c) If $\nabla$ is backward difference operator then $\nabla^3 Y_3 = ?$

d) What is a power function and exponential function ?

e) Write Newton's backward difference formula for $\left[\frac{dy}{dx}\right] x = xn$ and

$\left[\frac{d^2y}{dx^2}\right] x = xn$ :

f) Write the Simpson's 3/8 rule for $\int_{x_0}^{x_n} y\,dx$.

g) If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} -1 & 0 \\ 2 & 3 \end{bmatrix}$ find $(AB)^1$.

h) If $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$ show that $AI = A$.

P.T.O.

i) Define symmetric and skew-symmetric matrix. Give example.

j) Write the Taylor's series for y(x).

k) Write Runge-Kutta 2nd order formula.

l) Write Milne's Predictor formula.

## PART – B

### Unit – I

2. a) Explain the method of False Position.

b) In the table below the values of y are consecutive terms of a series of whic the number 21.6 is the 6th term. Find the first term of the series using Newton forward difference interpolation formula.

| X | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|
| Y | 2.7 | 6.4 | 12.5 | 21.6 | 34.3 | 51.2 | 72.9 |

c) Certain corresponding values of x and $\log_{10}x$ are (300, 2.4771), (304, 2.4829 (305, 2.4843) and (307, 2.4871). Find $\log_{10}$ 301 using Lagrange's Interpolatic Formula. (5

3. a) Find the real root of the following equation : $f(x) = x^3 - x - 1 = 0$ using Bisection method.

b) Find a root of the equation $x \sin x + \cos x = 0$ using Newton-Raphson metho

c) Given the set of tabulated points (1, – 3), (3, 9), (4, 30) and (6, 132). Obtai the value of y when x = 2 using Newton's divided difference Formula. (5

### Unit – II

4. a) The table below gives the temperature T (in°C) and lengths $l$ (in mm) of a heated rod. If $l = a_0 + a_1 T$, find the best values for $a_0$ and $a_1$.

| T | 20° | 30° | 40° | 50° | 60° | 70° |
|---|---|---|---|---|---|---|
| $l$ | 800.3 | 800.4 | 800.6 | 800.7 | 800.9 | 801.0 |

b) Calculate the first and second derivatives of the function tabulated below at the point x = 2.2 using Newton's backward difference formula.

| X | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 2.2 |
|---|---|---|---|---|---|---|---|
| Y | 2.7183 | 3.3201 | 4.0552 | 4.9530 | 6.0496 | 7.3891 | 9.0250 |

c) Evaluate $I = \int_0^1 1/(1+x)\,dx$ by trapezoidal rule when h = 0.25, correct to three decimal places. **(5+5+5)**

5. a) Determine the constants a and b by the method of least squares such that $y = ae^{bx}$, fit the following data.

| x | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|
| y | 4.077 | 11.084 | 30.128 | 81.897 | 222.62 |

b) From the following table of values of x and y, obtain $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ for x = 1.6 using Newton's forward difference formula.

| X | 1.0 | 1.2 | 1.4 | 1.6 | 1.8 | 2.0 | 2.2 |
|---|---|---|---|---|---|---|---|
| Y | 2.7183 | 3.3201 | 4.0552 | 4.9530 | 6.0496 | 7.3891 | 9.0250 |

c) Evaluate $I = \int_0^1 \cos x\,dx$ using Simpson's 3/8 rule when h = 0.2. **(5+5+5)**

## Unit – III

6. a) Solve the equations using LU Decomposition method.

$2x + 3y + z = 9$
$x + 2y + 3z = 6$
$3x + y + 2z = 8$

b) Solve the following equations using matrix inversion method.

$3x + y + 2z = 3$
$2x - 3y - z = -3$
$x + 2y + z = 4$

c) Express the matrix $A = \begin{bmatrix} 1 & 7 & 8 \\ 6 & 2 & 9 \\ 5 & 4 & 3 \end{bmatrix}$ as a sum of symmetric and skew-symmetric matrix. (5+5

7. a) Solve the following system using Jacobi's method. Carry out 2 iterations.

$10x + 2y + z = 9$

$2x + 20y - 2z = -44$

$-2x + 3y + 10z = 22$

b) Solve the following system using Gauss-Seidal method. Carry out 2 iterations.

$10x + 2y + z = 9$

$2x + 20y - 2z = -44$

$-2x + 3y + 10z = 22$

c) Explain Gauss Elimination Method. (5+5

## Unit – IV

8. a) Given $dy/dx - 1 = xy$ and $y(0) = 1$, obtain the Taylor's series for $y(x)$ and compute $y(0.1)$, correct to four decimal places.

b) Explain Modified Euler's method.

c) Given $\frac{dy}{dx} = y - x$ where $y(0) = 2$, and $h = 0.1$. Find $y(0.2)$ using Runge-Kutta fourth order formula. (5+5

9. a) Using Adams-Moulton formula, solve $y' = 1+y^2$ where $y = 0$ when $x = 0$, and $h = 0.2$. Find $y(0.8)$. Given that $y(0.2) = 0.2027$, $y(0.4)=0.4228$, $y(0.6) = 0.6841$.

b) Derive Milne's corrector method.

c) Using Euler's method solve the differential equation $\left(\frac{dy}{dx}\right) + 2y = 0$, where $h = 0.1$ and obtain $y(0.1)$, $y(0.2)$, $y(0.3)$. (5+5

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BCACAC 251

**edit Based Fourth Semester B.C.A. Degree Examination, May/June 2016**
**(Old Syllabus) (2012-2013 and Earlier Batches)**
**COMPUTER GRAPHICS AND MULTIMEDIA**

ne : 3 Hours Max. Marks : 80

***Note :*** *Answer* ***any ten*** *questions from Part – **A** and* ***one full*** *question from* ***each*** *Unit of Part – **B**.*

PART – A

. a) Expand GKS and JPEG. **(10×2=20)**
b) What is meant by tint fill ?
c) Define silver.
d) What is moving pen ?
e) Write a note on line style.
f) What is clipping ?
g) What is multimedia ?
h) Differentiate synchronous and asynchronous transformations.
i) What is meant by dithering ?
j) What are DAC and ADC ?
k) Explain the components of MIDI standard.
l) Mention any two advantages of CD-ROM.

PART – B

**Unit – I**

2. a) Explain the conceptual framework for interactive graphics system.
b) Derive midpoint circle algorithm.
c) Write a note on pattern filling. **(5+6+4)**

3. a) What are the advantages and disadvantages of using raster display system over vector display system ?
b) Write and explain DDA line algorithm.
c) Explain moving pen method for drawing thick primitives. **(5+6+4)**

P.T.O.

## Unit – II

4. a) Explain Sutherland Hodgeman polygon clipping technique.
   b) Show that two successive scaling are multiplicative.
   c) Explain the homogeneous co-ordinate system for 2D transformation. (8+

5. a) Explain the sequence of transformation required for rotating an object abou some arbitrary point with the help of diagrams. Obtain the net transformatio matrix.
   b) Scale a polygon having end points A(15, 20), B(50, 20), C(50, 60) and D(15, 60 on a 2D space by 1.5 along x-axis and 2 along y-axis.
   c) Explain Window-to-Viewport transformation. (6+

## Unit – III

6. a) Explain the three different transmission modes in Data Stream characteristics
   b) Explain different types of media.
   c) Explain MIDI reception modes. (6+

7. a) List and explain the main properties of a multimedia system.
   b) Explain Sampling and Quantization.
   c) Give the matrix representation of 3D translation, scaling and rotation about a 3 axes with respect to homogeneous co-ordinate system. (5+

## Unit – IV

8. a) Explain the various coding techniques used for compressing multimedia.
   b) Explain image recognition steps.
   c) Explain sessions of CD-WO. (6+

9. a) Briefly explain the subareas of image processing.
   b) Explain the basic technology of optical storage.
   c) Write a note on audio encoding. (5+

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# BCACAC 252

## redit Based Fourth Semester B.C.A. Degree Examination, May/June 2016
## (Old Syllabus) (2012 – 13 and Earlier Batches)
## INTERNET PROGRAMMING

ime : 3 Hours Max. Marks : 80

***Note** : Answer **any ten** questions from Part – **A** and **any one full** question from **each** Unit in Part – **B**.*

PART – A

**(10×2=20)**

1. a) Write the structure of HTML program.

   b) List any two attributes of <HR> and mention their purpose.

   c) What is form ? Write the purpose of ACTION attribute of <FORM> element.

   d) Give the purpose of any four methods of string object in JavaScript.

   e) Write the syntax of creating array in JavaScript. Give an example.

   f) List any four built-in objects of JavaScript.

   g) What is the purpose of with statement in JavaScript ?

   h) Give the syntax of MsgBox function in VBScript.

   i) Write the syntax of Case statement in VBScript.

   j) What is the purpose of Mid function in VBScript ? Give example.

   k) What is DTD declaration in XML ?

   l) What is CSS ? Why it is required ?

P.T.O.

BCACAC 252

## PART – B

### Unit – I

2. a) Explain <IMG> tag along with its attributes.
   b) What is the purpose of a frame ? How can we create it ? Explain.
   c) What are ordered and unordered lists ? Explain with examples.

3. a) Discuss the purpose of following tags :
      i) <HEAD>
      ii) <SPAN>
      iii) <DIV>
      iv) <SELECT>
      v) <A>
   b) Explain MARQUEE tag along with all its attributes.
   c) How can we create tables in HTML ? Explain with example.

### Unit – II

4. a) Explain any five document objects in JavaScript.
   b) List and explain any four date methods with suitable examples.
   c) Explain while loop in JavaScript with example.

5. a) Write the syntax of if statement in JavaScript. Explain with suitable exam
   b) With examples explain how a function can be declared and accesse JavaScript.
   c) What is a variable ? Name the different rules used for variables in JavaSc Give examples.

### Unit – III

6. a) Explain the different data types available in VBScript.
   b) Explain subroutines and function procedures in VBScript with examples each.
   c) Explain the two forms of do... loop with example.

7. a) Define array. Explain the terms REDIM, PRESERVE, UBOUND, ISARRAY with example.

b) Explain with following functions with examples :

i) INSTR( )
ii) FIX( )
iii) ASC( )
iv) WEEKDAY(DATE)
v) VarType( )

c) How do you handle error in VBScript ? Explain with example. **(5+5+5)**

## Unit – IV

8. a) Explain the different ways of adding styles to a document.

b) Explain any five font properties used in style sheet.

c) With suitable example explain how to view XML document using HTML tables. **(5+5+5)**

9. a) What are the naming rules in XML ? Also discuss about elements and attributes.

b) What are the different ways to load XML documents ? Explain.

c) Explain different background properties of style sheet with examples. **(5+5+5)**

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BCACAC 253

# Credit Based Fourth Semester B.C.A. Degree Examination, May/June 2016
## (Old Syllabus) (2012-13 and Earlier Batches)
## DATA MINING

me : 3 Hours

Max. Marks : 80

**Note :** *Answer* ***any ten*** *questions from Part –* ***A*** *and* ***one full*** *question from each Unit in Part –* ***B.***

PART – A **(10×2=20)**

1. a) What is data mart ?
   b) What is KDD ?
   c) Define confidence.
   d) What is clustering ?
   e) Define page rank.
   f) What is a SVM ?
   g) What is supervised learning ?
   h) What is neural network ?
   i) What is RBFN ?
   j) What is stemming ?
   k) What is categorical clustering ?
   l) What is co-citation and bibliographic coupling ?

PART – B

UNIT – I

2. a) Explain data warehouse architecture with diagram.
   b) Explain various stages of KDD.
   c) Explain issues and challenges in data mining. **(5+5+5)**

3. a) Differentiate DBMS and DM.
   b) Explain two different types of data marts.
   c) Explain the Roll up and Roll down operations along with neat sketch. **(5+5+5)**

P.T.O.

## UNIT – II

4. a) Explain cleaning and enrichment process in KDD.
   b) Explain numerical clustering.

5. a) Explain data selection and coding process in KDD.
   b) What is metadata ? State its purpose.

## UNIT – III

6. a) Explain MLP with neat diagram.
   b) Explain rough set theory.
   c) Explain unsupervised learning.

7. a) Describe the two different architectures of feed-forward network.
   b) Expain genetic algorithm.

## UNIT – IV

8. a) Explain apriori algorithm.
   b) Briefly state the purpose of web mining.
   c) Explain the features of unstructured text.

9. a) Explain association rule along with example.
   b) Mention and explain two types of web usage mining.

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**BCACAC 254**

# Credit Based IV Semester B.C.A. Degree Examination, May/June 2016
## (Old Syllabus) (2012-2013 and Earlier Batches)
## TCP/IP PROTOCOL AND PROGRAMMING

Time : 3 Hours  Max. Marks : 80

***Instructions :*** *Answer* ***any ten*** *questions from Part – **A** and* ***any one full*** *question from* ***each*** *Unit of Part – **B**.*

PART – A

1. a) Explain World Wide Web. **(10×2=20)**
   b) Write a note on default route.
   c) Define Datagram.
   d) What is an IAB ?
   e) Write a note on ATM.
   f) Define routing table.
   g) Differentiate between unicasting and multicasting.
   h) What does HLEN and TOTAL LENGTH fields in Internet Datagram mean ?
   i) Listout the two types of subnets.
   j) Define supernet addressing.
   k) What is Client Server Model ?
   l) How to connect socket to destination address ?

PART – B

UNIT – I

2. a) Explain the different classes of addressing scheme in internet protocol.
   b) Explain the dual counter rotating FDDI ring network.
   c) Write a short note on application level internet service. **(5+5+5)**

**P.T.O.**

3. a) List and explain the network level internet service.
   b) Write a note on Ethernet Technology.
   c) Explain how CSMA/CD works with an analogy to real life situation. (5+

UNIT – II

4. a) Write a note on :
      i) Direct Delivery
      ii) Next Hop Routing.
   b) Write a note on connectionless delivery system.
   c) Explain Datagram size, Network MTU and Fragmentation. (5+

5. a) Explain IP routing algorithm.
   b) Explain the datagram delivery over a single network.
   c) Explain default routes and host specific routes. (5+

UNIT – III

6. a) With the help of diagram explain the proxy ARP.
   b) Explain the seven conceptual layers in OSI reference model. (5+

7. a) Write a note on subnet addressing.
   b) Explain the need for multiple protocols.
   c) Explain the different steps performed by master servers. (5+

UNIT – IV

8. a) Explain the following system calls with the proper sequence to create, bind, connect send data and then close the socket.
   b) Explain the various system calls used for accessing Domain Name System. (10

9. a) Explain the following system calls with respect to socket.
      i) Writev ii) Sendto iii) Getsocketopt
   b) How a server assigns a local address to a socket ? Explain.
   c) How a server accept connection ? Explain. (6+5

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BCACAC 255

# Credit Based Fourth Semester B.C.A. Degree Examination, May/June 2016
## (Old Syllabus) (2012-13 and Earlier Batches)
## COMPUTER ORIENTED NUMERICAL ANALYSIS (CONA)

e : 3 Hours

Max. Marks : 80

***Note*** : *1) Answer **any 10** questions from Part – **A** and **one full** question from **each** Unit in Part – **B**.*

*2) Scientific calculator is **allowed.***

PART – A

**(2×10=20)**

a) Define absolute and relative error.

b) Define interpolation and extrapolation.

c) Find the relative error of the number 8.6 if both of its digits are correct.

d) Define the divided difference $[x_0, x_1, x_2]$.

e) Show that $\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$ is orthogonal

f) If $A = \begin{bmatrix} 0 & 2 & 3 \\ -2 & 0 & 5 \\ -3 & -5 & 0 \end{bmatrix}$ Show that $A^1 = -A$.

g) Given the matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$, find $\|A\|_1$, $\|A\|_\infty$.

P.T.O.

h) What is power function ?

i) Given $y' = -y$, $y(0) = 1$. $h = 0.01$. Find $y(0.01)$ using Euler's method.

j) Write Runge-Kutta 4th order formula.

k) In Milne's method, $y_2 =$ _____ ?

l) Write the formula for Simpson's $\frac{3}{8}$ th rule.

PART – B

UNIT – I

2. a) Using method of bisection find a real root of $x^3 - 4x - 9 = 0$, correct to 3 decimal places.

b) Find the real root of the equation $f(x) = x^3 - 2x - 5 = 0$ using the method of false position, correct to 2 decimal places.

c) Derive Newton's forward difference formula to interpolate the set of points $(x_0, y_0)$, $(x_1, y_1)$ ..... $(x_n, y_n)$. (6+5

3. a) Given the set of tabulated points (1, –3), (3, 9), (4,30) and (6,132). Obtain the value of y when x = 2 using Newton's divided difference table.

b) The population of a town in the decimal census was as given below. Estimate the population for the year 1925 using Newton's backward difference interpolation formula.

| Year (x) | 1891 | 1901 | 1911 | 1921 | 1931 |
|---|---|---|---|---|---|
| Population (y) (in thousands) | 46 | 66 | 81 | 93 | 101 |

c) If $y_1 = 4$, $y_3 = 12$, $y_4 = 19$, $yx = 7$, find x using Lagrange's interpolation formula.

UNIT – II (5+5

4. a) Certain experimental values of x and y are given below.

| x | 0 | 2 | 5 | 7 |
|---|---|---|---|---|
| y | –1 | 5 | 12 | 20 |

If $y = a_0 + a_1 x$, find approximate values of $a_0$ and $a_1$.

b) From the following table of values of x and y, obtain $d(J_0)/dx$ and at $x = 0.1$ Using Newton's forward difference formula.

| X | 0.0 | 0.1 | 0.2 | 0.3 | 0.4 |
|---|---|---|---|---|---|
| $J_0(x)$ | 1.0000 | 0.9975 | 0.9900 | 0.9776 | 0.9604 |

c) Evaluate $I = \int_0^1 \frac{1}{x} dx$ by Simpson's 1/3 rule with 4 strips. **(5+6+4)**

5. a) Fit the polynomial of a second degree to the data points given in the following table.

| x | 0 | 1.0 | 2.0 |
|---|---|---|---|
| y | 1.0 | 6.0 | 17.0 |

b) From the following table of values of x and y, obtain $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ for $x = 3$, using Newton's forward formula.

| x | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| y | 6.9877 | 7.4036 | 7.7815 | 8.1291 | 8.4510 | 8.7506 | 9.0309 |

c) Find the area bounded by the curve and the x-axis from $x = 7.47$ to $x = 7.52$ from the following table (using trapezoidal rule). **(5+6+4)**

| x | 7.47 | 7.48 | 7.49 | 7.50 | 7.51 | 7.52 |
|---|---|---|---|---|---|---|
| F(x) | 1.93 | 1.95 | 1.98 | 2.01 | 2.03 | 2.06 |

UNIT – III

6. a) Solve the given system of equations

$3x + y + 2z = 3$

$2x - 3y - z = -3$

$x + 2y + z = 4$, using matrix inversion method.

b) Solve the equations using Gauss-Jordan method,

$2x + 4y + z = 3$

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

c) Solve the equations using Gauss-Seidel method,

$10x + 2y + z = 9$

$2x + 20y - 2z = -44$

$-2x + 3y + 10z = 22$, carry out 2 iterations. (5

7. a) Solve the equations using Gauss Elimination method,

$3x + y + 2z = 3$

$2x - 3y - z = 6$

$3x + y + 2z = 8$

b) Solve the following system of equations using Jacobi's method (carry out 2 iterations)

$83x + 11y - 4z = 95$

$7x + 52y + 13z = 104$

$3x + 8y + 29z = 71.$

c) Solve the equations using LU decomposition method,

$2x + 3y + z = 9$

$x + 2y + 3z = 6$

$3x + y + 2z = 8.$ (5+4

## UNIT – IV

8. a) Given $\frac{dy}{dx} - 1 = xy$ with $y(0) = 1$, obtain Taylor series expansion for $y(x)$ and find $y(0.1)$, correct to 4 decimal places.

b) Given $dy/dx = y - x$ where $y(0) = 2$, and $h = 0.1$. Find $y(0.1)$ using Runge-Kutta fourth order formula.

c) Derive Milne's predictor method. (6+5

9. a) Determine the values of y when $x = 0.1$ given $y(0) = 1$, solve $\frac{dy}{dx} = x^2 + y$, using Euler's modified method. Take $h = 0.5$.

b) Using Adam-Moultan formula, solve $y' = 1 + y^2$, where $y = 0$ when $x = 0$, and $h = 0.2$. Find $y(0.8)$. Given that $y(0.2) = 0.2027$, $y(0.4) = 0.4228$, $y(0.6) = 0.6841$.

c) Solve the boundary value problem $\frac{d^2y}{dx^2} = y$ with boundary conditions $y(0) = 0$, $y(2) = 3.627$ with $h = 0.5$ by using finite difference method. $y = \sinh x$. (6+4+