41223/B 230

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

II Semester B.C.A.4 Degree Examination, May/June 2018
DATA STRUCTURES USING 'C'
(Regular)

Time : 3 Hours Max. Marks : 80

Instructions : *1) Answer all Sections.*
2) Draw neat diagrams wherever necessary.
3) Write question numbers correctly.

SECTION – A

1. Answer **all** questions : **(10×2=20)**
   a) List advantages of pointer.
   b) State the use of calloc ( ) function with syntax.
   c) State the purpose of rewind ( ) function.
   d) List applications of data structures.
   e) What is recursion ?
   f) Evaluate the following postfix expression 12 – 34 – *.
   g) What is circular queue ?
   h) Differentiate between linear search and binary search.
   i) State advantages of linked list.
   j) Define a node in a singly linked list.

SECTION – B

Answer **any four** questions : **(4×5=20)**

2. Write a program in C to read a text file and convert the file contents in uppercase and write the contents in an output file.
3. Discuss the classification of data structure with example.
4. Define stack. Explain various operations performed on stack.
5. Explain double ended queue.
6. Write a note on doubly linked list.

P.T.O.

SECTION – C

Answer **any four** questions : **(4×10=40)**

7. What is file ? Explain with syntax two input and two output functions related to file.

8. a) Explain the merge sort technique with example.

   b) Write a program in C to find GCD of two numbers using recursion. **(5+5)**

9. a) Convert the following expressions to postfix expression.

      i) ((A + (B – C) * D) ^ E + F)

      ii) (a+(b*c) – d)/e.

   b) Write a program in C to search an element in an array using sequential search. **(5+5)**

10. Write a program in C to perform all operations on ordinary queue.

11. Write short notes on **any two** : **(5+5)**

      i) Dynamic Memory Allocation

      ii) Tower of Hanoi

      iii) Conversion of expressions using stack.

41222/B 220

Reg. No :

II Semester B.C.A.4 Degree Examination, May/June 2018
MATHEMATICS – II (Regular)

Time : 3 Hours Max. Marks : 80

Instructions : *1) Question paper has **three** Parts.*
*2) Answer **all** the **three** Parts.*
*3) Part – **A** carries **20** marks, Part – **B** carries **20** marks, Part – **C** carries **40** marks.*

PART – A

1. Answer **all** questions **compulsory**. **(10×2=20)**

a) Define convergence and divergence of infinite series.

b) Evaluate $\begin{vmatrix} 1992 & 1993 \\ 1994 & 1995 \end{vmatrix}$.

c) Define unit matrix.

d) Evaluate $\lim_{x \to 1} \left[\frac{x^6 - 1}{x - 1} \right]$.

e) Evaluate $\lim_{x \to 1} \frac{x^2 - 4x + 3}{x^2 - 3x + 2}$.

f) If $y = x^2 \sin x$ find $\frac{dy}{dx}$.

g) If $y = \tan^3 x$ find $\frac{dy}{dx}$.

h) Integrate w.r.t. x : $\int (x^3 + 3x^2 + 7x - 13)\, dx$.

i) Evaluate $\int \sin^3 x dx$.

j) Integrate w.r.t. x : $\int \sin x \cos x \, dx$.

P.T.O.

PART – B

Answer **any four** of the following : **(4×5=20)**

2. Solve by Cramer's rule

$x + y + 2z = 7$

$3x + 2y - z = 2$

$5x + 2y - z = 3$

3. If $f(x) = \begin{cases} x^2 + 1, & \text{when } x < 2 \\ 5, & \text{when } x = 2 \\ 4x - 3, & \text{when } x > 2 \end{cases}$

Find $\lim_{x \to 2} f(x)$ if exists.

4. Verify Rolle's theorem for the function $f(x) = x^2 - 6x + 8$ in the interval [2, 4].

5. Evaluate $\int \frac{x-1}{(x-2)(x-3)} dx$.

6. Find $\frac{d^2y}{dx^2}$ if $y = \log(ax + b)$.

PART – C

Answer **any four full** questions : **(4×10=40)**

7. a) Test for convergence of the series whose n^{th} term is $\frac{n^2}{2^n}$ by D'Alemberts' Ratio test.

b) Examine the convergence of the series $\sum \frac{1}{\left(1+\frac{1}{n}\right)^{n^2}}$ by Cauchy's Root test.

8. a) Solve $\begin{vmatrix} x+1 & 2 & 3 \\ 1 & x+2 & 3 \\ 1 & 2 & x+3 \end{vmatrix} = 0$.

b) Find the Rank of the Matrices by Elementary Row Transformation

$$\begin{bmatrix} 1 & 2 & 3 & 2 \\ 2 & 3 & 5 & 1 \\ 1 & 3 & 4 & 5 \end{bmatrix}.$$

9. a) Evaluate $\lim_{x \to a} \frac{x^2 - a^2}{\sqrt{2x + a} - \sqrt{x + 2a}}$.

b) Differentiate $x.e^x.\sin x$ w.r.t. 'x'.

10. a) Find the maximum and minimum values of the function $2x^3 - 3x^2 - 36x + 1 = 0$.

b) Obtain Taylor's expansion of $\log_e x$ about $x = 1$ upto the term containing 2^{nd} degree.

11. a) Evaluate $\int x^2 e^x dx$.

b) Integrate $\int \frac{(\log x)^2}{x}$.

41221/B 210

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

II Semester B.C.A.4 Degree Examination, May/June 2018
(Regular)
FINANCIAL MANAGEMENT

Time : 3 Hours Max. Marks : 80

Instructions : *1) Attempt **all** Sections according to **internal choice.***
*2) Simple and non-programmable **calculator** are **allowed.***

SECTION – A

1. Answer the followings : **(10×2=20)**
   a) State any two objectives of management accounting.
   b) Define funds flow statements.
   c) What is liquidity ratio ?
   d) State any two sources of funds.
   e) What is cash flow statement ?
   f) What is marginal costing ?
   g) What is prime cost ?
   h) What is contribution ?
   i) Define Joint Stock Company.
   j) What is Break Even Point (BEP) ?

SECTION – B

Answer **any four** of the following : **(4×5=20)**

2. Define management accounting. Explain its advantages and disadvantages.
3. Calculate funds from operations from the following data :

	Rs.
Profit as per Profit and Loss A/c	71,000
Depreciation on fixed assets	30,000
Loss on sale of machinery	1,000
Goodwill written off	1,000
Patents written off	500
Discount on issue of shares	2,000
Profit on sale of building	12,500

4. Distinguish between cash flow statement and funds flow statements.

P.T.O.

5. Calculate cash from operating activities from the following information for the year ended 31-3-2015. (Under Direct Method)

		Rs.
Cash Sales		2,00,000
Receipts from Debtors		10,00,000
Commission and Brokerage Received		1,00,000
Payments to Suppliers		4,00,000
Cash purchase		40,000
Outstanding Salaries		10,000
Cash payments :		
Salaries	24,000	
Rent	16,000	
Repairs	8,000	48,000
Proceeds from Relief Settlement		26,000
Tax paid		64,000

6. Briefly explain the functions of management accounting.

SECTION – C

Answer the following **any four** : **(4×10=40)**

7. The following is position statement of Aarush Company Limited.

Particulars	**Rs.**
I Equity and Liabilities :	
Equity share capital	5,00,000
Preference share capital	2,00,000
9% Debentures	4,00,000
Reserves and Surplus	3,00,000
Current liabilities	2,00,000
	16,00,000
II Assets :	
Plant and Machinery	5,00,000
Land and Building	6,00,000
Inventories	2,40,000
Sundry Debtors	2,00,000
Cash	55,000
Prepaid Expenses	5,000
	16,00,000

You are required to calculate :

1) Current Ratio 2) Quick Ratio 3) Proprietary Ratio
4) Debt. Equity Ratio 5) Capital Gearing Ratio

8. From the following particulars prepare cost sheet of Shri Durdundeshwar Co.

Stock of raw material as on 1-4-2016		75,000
Stock of raw material as on 31-3-2017		85,000
Opening stock of finished goods 1-4-2016		1,15,000
Closing stock of finished goods 31-3-2017		3,00,000
Productive wages		1,20,000
Purchase of raw material		2,50,000
Factory expenses Variable	40,000	
Fixed	50,000	90,000
Administration expenses		1,35,000
Selling expenses		1,50,000
Sales		7,50,000

9. Sales price Rs. 20 per unit
Variable manufacturing cost Rs. 11 per unit
Variable selling cost Rs. 3 per unit
Fixed factory overheads Rs. 5,40,000 per year
Fixed selling costs Rs. 5,52,000 per year
You are required to calculate :
1) BEP in amount of sales in rupees.
2) No. of units that must be sold to earn profit Rs. 6,000 p.a.

10. Prepare :
i) Schedule changes in working capital
ii) Funds from operations
iii) Funds flow statements from the following financial statements of Green Co. Ltd.

Particulars	**2016**	**2017**
Assets :		
Cash	53,000	31,000
Investments	87,000	–
Sundry Debtors	3,46,000	5,28,000
Stock	4,32,000	6,83,000
Fixed Assets	11,13,000	13,98,000
	20,31,000	**26,40,000**
Liabilities :		
Sundry Creditors	4,13,000	6,27,000
Bills payable	2,26,000	3,14,000
Loan from Bank	1,00,000	2,35,000
Reserve and Surplus	6,92,000	8,64,000
Share capital	6,00,000	6,00,000
	20,31,000	**26,40,000**

Depreciation of Rs. 1,89,000 was written off for 2016 on fixed assets.

11. From the following trial balance prepare Trading, Profit and Loss A/c and Balance Sheet.

Particulars	**Dr.**	**Cr.**
Share capital	–	2,50,000
Opening stock 1-4-2016	45,000	–
Wages	40,000	–
Purchases and Sales	1,25,000	2,00,000
Freight	10,000	–
Salary	10,000	–
Rent	5,000	–
Discount	4,000	3,000
Sundry Expenses	3,500	–
Bad Debts.	1,000	–
Profit and Loss A/c	–	11,000
Dividend	2,500	–
Interim Dividend	1,500	–
Debtors and Creditors	35,000	24,000
Building	80,000	–
Machinery	25,000	–
Investments	75,000	–
Reserve funds	–	12,000
Loans to employees	2,000	–
Cash	25,500	–
6% Debentures	–	50,000
Calls in arrears	10,000	–
Goodwill	50,000	–
	5,50,000	**5,50,000**

Adjustments :

1) Closing stock as on 31-3-2017 Rs. 50,000.
2) Transfer Rs. 3,000 to Reserve Fund.
3) Reserve for doubtful debts at 5%.
4) Depreciate machinery at 10%.
5) O/S Interest on debentures for one year.

41224/B 240

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

Second Semester B.C.A.4 Degree Examination, May/June 2018
(Regular)
DIGITAL LOGIC AND COMPUTER DESIGN

Time : 3 Hours Max. Marks : 80

Instructions : ***1) All Sections are compulsory.***
2) Draw neat diagrams wherever necessary.

SECTION – A

1. Answer **all** the questions, **each** carries **two** marks. **(2×10=20)**
   a) Convert 1011010011 into octal and hexadecimal numbers.
   b) What are Excess-3 and gray codes ?
   c) Define canonical form. Mention two canonical forms.
   d) What are Don't-care conditions ?
   e) What do you mean by combinational circuit ? Give examples.
   f) Define terms :
      i) Encoder ii) Decoder
   g) What is the difference between Latches and Flip-flops ?
   h) What are Ripple and Synchronous counters ?
   i) What are the steps involved in Memory Write and Memory Read Operations ?
   j) What is ROM ? Mention types of ROMs.

SECTION – B

Answer **any four** questions, **each** carries **five** marks. **(5×4=20)**

2. Explain signed binary numbers.
3. What are sum of products and product of sums ? Explain with examples.
4. What is Magnitude Comparator ? Explain in brief.
5. Write a note on counters.
6. Explain the types RAMs.

SECTION – C

Answer **any four** questions, **each** carries **ten** marks. **(10×4=40)**

7. What is number system ? Explain four number systems.
8. Simplify the following Boolean function using four variable maps. Draw minimized circuit diagram $F(w, x, y, z) = \Sigma(1, 3, 4, 5, 6, 7, 9, 11, 13, 15)$.
9. Drawing neat logic diagrams and function tables and explain the following :
   a) Half Adder b) Full Adder **(5+5)**
10. Briefly explain SR, JK, T and D flip-flops and draw excitation tables.
11. Explain Hamming Code.

32224/B 240

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

II Semester B.C.A. 3 Degree Examination, May/June 2018
(Repeaters)
DATA STRUCTURES USING 'C'

Time : 3 Hours Max. Marks : 80

Instructions : ***1) Answer all Parts.***

2) Draw neat diagrams wherever necessary.

3) Write question numbers correctly.

PART – A

1. Answer **any ten** of the following : **(2×10=20)**

   a) What is a structure ? Give example.

   b) Write the syntax of getc() and putc() functions.

   c) What are primitive and non primitive data structures ?

   d) Convert the following expression from infix to postfix :

   (A + B) * C/D.

   e) Define recursion.

   f) What is FIFO ?

   g) What are the advantages of a Linked List ?

   h) What are self referential structures ?

   i) Define Binary tree.

   j) Which are the different traversal techniques for a binary tree ?

   k) What is a pointer ?

   l) List the applications of a queue.

PART – B

Answer **any four** of the following : **(5×4=20)**

2. Write a program to implement the working of a stack.
3. Differentiate between static and dynamic memory allocation methods.
4. Write a program to demonstrate the working of a simple queue.
5. Write a note on representation of a Linked List.
6. Explain complete binary tree and binary search tree.
7. Write a note on error handling in files.

P.T.O.

PART – C

Answer **any four** of the following : **(10×4=40)**

8. Write a C program to create a file to store employee details like eno., ename and salary and display its contents in proper format.
9. Explain the classification of data structures in detail.
10. a) Write a program to find binomial coefficient using recursion.
    b) Explain the primitive operations on a stack. **(5+5)**
11. a) Explain circular queue and its operations using an example.
    b) Define the following :
        i) Node
        ii) Degree of a node
        iii) Root. **(4+6)**
12. Explain the different types of linked list with diagram.

32221/B 210

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

II Semester B.C.A.3 Degree Examination, May/June 2018
CALCULUS
(Repeaters)

Time : 3 Hours Max. Marks : 80

***Instructions** : 1) Answer **all** Sections.*
*2) Use of simple calculators is **allowed**.*

SECTION – A

1. Answer **any ten** of the following : **(10×2=20)**

a) If the angles of a triangle are in the ratio 1 : 2 : 3, then find the smallest angle in radian.

b) Prove that $(1-\sin^2\theta)(1+\tan^2\theta)=1$.

c) Find the value of tan 240°.

d) Express the complex number 1 + i in the polar form.

e) Express the complex number $\frac{2+i}{2-i}$ in the x + iy form.

f) Evaluate $\lim_{x\to 0}\frac{\sin 5x}{x}$.

g) Evaluate $\lim_{x\to 2}\frac{x^8-256}{x-2}$

h) Differentiate w.r.t. x $2x^3 + 3x^2 - 12x - 4$.

i) If $y = e^x \sin x$, find $\frac{dy}{dx}$.

j) State De-Moivre theorem.

k) Evaluate $\int\frac{dx}{3x+1}$.

l) Evaluate $\int_2^3 x^3 dx$.

P.T.O.

SECTION – B

Answer **any four** of the following : **(4×5=20)**

2. The angle of elevation of the top of the tower at a distance 500 m from its foot is 30°. Find the height of the tower.

3. Prove that $\frac{1+\sin 2\theta}{\cos 2\theta} = \tan\left(\frac{\pi}{4}+\theta\right)$.

4. If $x = \cos\alpha + i\sin\alpha$, $y = \cos\beta + i\sin\beta$, then prove that $\frac{x^m}{y^n} + \frac{y^n}{x^m} = 2\cos(m\alpha - n\beta)$.

5. Evaluate $\lim_{x\to 3} \frac{x^2-9}{x^5-243}$.

6. Differentiate $\frac{1+\sqrt{x}}{1-\sqrt{x}}$ w.r.t. x.

7. Evaluate $\int x\cos x\, dx$.

SECTION – C

Answer **any four** of the following : **(4×10=40)**

8. a) Prove that $\frac{\sin x}{1-\cos x} = \frac{1+\cos x}{\sin x}$.

   b) Evaluate $\cos^2(135°)\cos^2(45°) - \sin^2(135°)\sin^2 45°$. **(5+5=10)**

9. a) Simplify $(1+i)^8 + (1-i)^8$.

   b) If $x + \frac{1}{x} = 2\cos\theta$, then prove that $x^n + \frac{1}{x^n} = 2\cos n\theta$. **(5+5=10)**

10. a) Discuss the continuity of the function f(x) defined by

$$f(x)=\begin{cases} x^2 & \text{if} \quad x<1 \\ x^2-\frac{1}{2} & \text{if} \quad x\geq 1 \end{cases} \quad \text{at} \quad x=1$$

b) Evaluate $\lim_{\theta\to 0}\frac{\sin 6\theta}{\sin 8\theta}$. **(5+5=10)**

11. a) If $y = e^{ax}\sin bx$, find $\frac{d^2y}{dx^2}$.

b) If $x = a\cos^4\theta$, $y = a\sin^4\theta$, find $\frac{dy}{dx}$. **(5+5=10)**

12. a) Evaluate $\int\frac{dx}{(x+1)(x+2)}$.

b) Find the area bounded by the curve $x^2 = 4y$, the x-axis and the ordinates $x = 1$ and $x = 4$. **(5+5=10)**