

(3)

**SARDAR PATEL UNIVERSITY****F.Y.B.C.A.(1<sup>st</sup> Sem.) Examination****US01CBCA01 : Fundamentals of Computer Programming using C****Date : 11.11.2011****Time : 10.30 – 1.30 pm****Marks: 70****Day : Friday****Q-1** Select the appropriate option for the following questions. **[ 10 ]**

1. \_\_\_\_\_ is a step by step approach to solve any problem.  
(A) Algorithm (B) Process (C) Compiler (D) Processor
2. C is \_\_\_\_\_ level language.  
(A) Machine (B) High (C) Assembly (D) Low
3. \_\_\_\_\_ is the format specifier used for integer data type.  
(A) %c (B) %d (C) %b (D) %e
4. The combination of ? and : is known as \_\_\_\_\_ operator.  
(A) Arithmetic (B) Relational (C) Dot (D) Ternary
5. Do...while loop is known as \_\_\_\_\_ loop.  
(A) Entry level (B) Exit level (C) Both (A) and (B) (D) None
6. An array can be initialized either at compile time or at \_\_\_\_\_ time.  
(A) Run (B) Released (C) Allocation (D) None
7. The function isupper() is available in \_\_\_\_\_ header file.  
(A) upper.h (B) string.h (C) ctype.h (D) lower.h
8. Every C program begins its execution with \_\_\_\_\_.  
(A) main() (B) clrscr() (C) #include<stdio.h> (D) getch()
9. while(1) { printf("SARDAR PATEL UNIVERSITY"); }  
How many times execute above loop?  
(A) One (B) Zero (C) Infinite time (D) Finite time
10. What is the standard decision symbol for a flowchart?  
(A) Circle (B) Diamond (C) Square (D) Rectangle

**Q-2** Do as directed. (Attempt ANY TEN)**[ 20 ]**

1. What is an Editor? Give the examples of Well known editors.
2. Write an algorithm to find maximum from the given three numbers.
3. Explain symbols used to draw flow chart
4. Differentiate between increment and decrement operator.
5. Explain if...else statement with an example.

6. Define: Variable and Constant.
7. What is an array? Write down syntax to declare one dimensional array. Also give at least one example of it.
8. Explain while loop with an example.
9. Write down syntax and example for sqrt() function.
10. Define function. List out elements/components of user defined function.
11. Explain gets() function with an example.
12. How to declare a string in C? Give an example.

Q-3 What is Translator? List all translators. Explain ANY TWO of them. [ 10 ]

OR

Q-3 Explain Machine level language and High level language in detail. [ 10 ]

Q-4 (A) Write a brief note on Data types of C language. [ 5 ]

(B) Explain ANY TWO operators available in C language. [ 5 ]

OR

Q-4 (A) Explain the basic structure of C program. [ 6 ]

(B) List the basic rules to write a valid variable name. [ 4 ]

Q-5 (A) Explain the following function with syntax and example. [ 6 ]

[ A ] islower()      [ B ] abs()      [ C ] pow()

(B) Discuss the initialization of one dimensional array with an example. [ 4 ]

OR

Q-5 (A) Write a short note on for loop. [ 6 ]

(B) Differentiate between while and do....while loop. [ 4 ]

Q-6 Explain the categories of a function with an example. [ 10 ]

OR

Q-6 What is string? Explain the following function with syntax and example. [ 10 ]

[ A ] strlen()      [ B ] strcat()      [ C ] strrev()

All the best...

[3]

No. of Printed Pages: 3

SARDAR PATEL UNIVERSITY

F.Y.B.C.A. Semester- I Examination, 2011

US01CBCA02 – Computer Organization

Saturday, 12<sup>th</sup> November, 2011

Time: 10.30am – 1.30pm

Marks: 70

Answer of all the questions (including multiple choice questions) should be written in the provided answer book only.

Q-1 Select the correct option.

10

- 1 Numbers are stored and transmitted inside a computer in  
A. binary form  
B. ASCII code form  
C. decimal form  
D. alphanumeric form
- 2 Which parts of the computer perform arithmetic calculations?  
A. ALU  
B. Registers  
C. Logic bus  
D. Input device
- 3 The number of digits in octal system is  
A. 8  
B. 7  
C. 10  
D. 2
- 4 Storage representation of 18 using 1's complement method is \_\_\_\_\_  
A. 00010010  
B. 11101101  
C. 11011100  
D. 11111111
- 5 In \_\_\_\_\_ parity the total number of 1's in the complete code including parity bit is an odd number  
A. Even  
B. Odd  
C. Even-odd  
D. None
- 6 In pipeline a single instruction is divided in \_\_\_\_\_ stages  
A. 2  
B. 3  
C. 4  
D. 5
- 7 In hard disk metal plates are coated by thin film of  
A. Magnetic material  
B. Electric material  
C. electromagnetic material  
D. none of these
- 8 Floppy disk is a  
A. Removable disk  
B. permanent Disk  
C. direct access disk  
D. none of these
- 9 Which one is the input device  
A. Printer  
B. Scanner  
C. Plotter  
D. none of them
- 10 If there is a mechanical contact between the print head and paper then this kind of printer is known as  
A. Impact printer  
B. non-impact printer  
C. normal printer  
D. none of these

**Q-2 Write answers in short [Any Ten out of Twelve]. 20**

1. Define : Hardware with an examples.
2. What is number system? List all number systems.
3. Examples of binary additions.
4. Explain 1's complement method with example.
5. Explain signed magnitude method with example.
6. Define odd and even parity.
7. List stages of pipelining.
8. What is ROM?
9. Explain Flash drive.
10. Give Two differences between input device and output device.
11. What is mouse?
12. List all addressing techniques.

- Q-3**
- A Draw the block diagram of computer and explain the function of each block. 4
- B Write a short note on first generation of computer. 4
- C Convert  $(110101011001010)_2 = ( ? )_8$  2

**OR**

- Q-3**
- A Differentiate between 1<sup>st</sup> generation and 2<sup>nd</sup> generation of computer. 4
- B Do as directed. 6
1. Convert  $(1823)_{10} = ( ? )_{16}$
  2. Subtract  $(110011.0010)_2 - (10111.0010)_2 = ( ? )_2$
  3. Convert  $(675)_{10} = ( ? )_2$

- Q-4**
- A Define Parity bit. Discuss Even Parity code with an example. 5
- B Discuss any ONE method for Integer representation. 5

**OR**

- Q-4**
- A Write a short note on ASCII code with an example. 6
- B List the steps of instruction execution cycle. 4

- Q-5 A Explain Floppy disk with diagram. 5  
B Discuss Multiprocessor. 5

OR

- Q-5 A Explain single pipeline with diagram 6  
B Write a short note on Cache memory. 4

- Q-6 Give examples of output devices. Explain Laser printer and Dot Matrix printer. 10

OR

- Q-6 List Addressing techniques. Explain any TWO Addressing techniques. 10

$X = X = X$

*Best of luck*

(3)

[9]

No. of Printed Pages: 2

**SARDAR PATEL UNIVERSITY**  
**F.Y.B.C.A. ( First Semester) (CBCS) Examination 2011**  
**Monday, 14<sup>th</sup> November**  
**10:30 a.m to 1:30 p.m**  
**US01CBCA03 || PC SOFTWARE**

Maximum Marks:70

**Q:1 Multiple Choice Questions:**

[10]

1. The brain of a computer is  
(a) Keyboard (b) CPU (c) Mouse (d) scanner
2. The system clock is maintained by  
(a) Hardware (b) OS (c) Software (d) Program
3. The spell-check feature can be initiated by pressing the function key \_\_\_\_\_  
(a) F1 (b) F5 (c) F9 (d) F7
4. Page margins can be changed in \_\_\_\_\_ option of File Menu.  
(a) Page Setup (b) Format Font (c) Format Paragraph (d) File
5. \_\_\_\_\_ key(s) move the cursor to the previous cell in the table.  
(a) Alt + Tab (b) Tab (c) Shift + Tab (d) Ctrl + Tab
6. Formula =ROUND (12345.123, -3) will result in \_\_\_\_\_.  
(a) 12345.123 (b) 12000.120 (c) 12000 (d) 123
7. Formula =INT(-12.678) Returns \_\_\_\_\_.  
(a) 12 (b) -12 (c) -13 (d) -11
8. \_\_\_\_\_ key(s) is used to insert a new slide in PowerPoint.  
(a) ^ m (b) ^ n (c) alt + m (d) none of these
9. Which of the following is not one of the PowerPoint's views?  
(a) Normal (b) Slide Sorter (c) Presentation (d) Outline
10. Header and Footer option is under \_\_\_\_\_ Menu.  
(a) File (b) View (c) Insert (d) Format

①

[P.T.O]

**Q:2 Answer the following questions. (Attempt Any Ten)**

**[20]**

1. What is the difference between Interpreter and Compiler?
2. What is mouse? How it is connected to the PC?
3. Explain the cut, copy and paste operation.
4. What is Footnote & Endnote in MS Word?
5. What is Hyphenation in MS Word?
6. What is a spreadsheet? Which are the application areas of spreadsheet package?
7. Explain Auto Sum function.
8. Explain in brief: Which Excel function is used to perform conditional calculations?
9. What is Formula Bar?
10. How you can create the presentation?
11. How can you protect your workbook from unauthorized access?
12. What are the usages of power point?

**Q:3** Write short note on: Classification of PC software.

**[10]**

**OR**

**Q:3** What is Personal Computer? Explain all units in detail.

**[10]**

**Q:4** A. What is a Template? Explain how to create and use Templates in MS Word.  
B. Explain Page Setup Dialog Box MS Word.

**[05]**

**[05]**

**OR**

**Q:4** A. Explain Mail Merge facility of MS Word.  
B. Explain the advantages of a spreadsheet package.

**[05]**

**[05]**

**Q:5** A. Explain any two Financial Functions with example.  
B. Explain following functions with Example.  
count(), round(), min(), now()

**[06]**

**[04]**

**OR**

**Q:5** A. What is cell addressing? Explain different types of cell addressing available in MS Excel.  
B. Explain following functions with Example.  
abs(), int(), max(), sqrt()

**[06]**

**[04]**

**Q:6** A. Explain Pivot Table facility of Excel.  
B. Explain the What if analysis.

**[06]**

**[04]**

**OR**

**Q:6** A. Describe the views available in power point.  
B. What do you mean by slide transition?

**[06]**

**[04]**

$\sqrt{x} = x = x$

(2)

(1)

[21]

**SARDAR PATEL UNIVERSITY**  
**First Year BCA (Semester – I) EXAMINATION**

**DATE: 15/11/2011, Tuesday**

**TIME: 10:30a.m to 1:30p.m**

**US01CBCA04: WEB DESIGNING FUNDAMENTALS [NEW CBCS]**

**Total Marks : 70**

- Note:**
1. All the questions are compulsory.
  2. Figures to the right indicate marks.
  3. Start a new question from a new page.

**Q.1 Answer the Following:**

[10]

- A.** Which of the following Internet services allows for remote controlling?  
 1. FTP                      2. TELNET                      3. USENET                      4. None of these
- B.** The software used for reading web pages is called \_\_\_\_\_  
 1. Web Server                      2. Web Client                      3. Browser                      4. None of these
- C.** The Multimedia setting is available under \_\_\_\_\_ tab in Internet Explorer.  
 1. General                      2. Advanced                      3. Privacy                      4. Content
- D.** To display text in the Window's title bar, \_\_\_\_\_ is used in HTML.  
 1. <H1>                      2. <text>                      3. <title>                      4. None of these
- E.** Which attribute is used with <font> to change the text to ARIAL in HTML?  
 1. text                      2. face                      3. type                      4. None of these
- F.** Which of the following attribute has the value justify in <p> tag in HTML?  
 1. align                      2. check                      3. cellpadding                      4. None of these
- G.** To make a Ordered list start counting from 5, \_\_\_\_\_ is used in HTML.  
 1. start                      2. value                      3. type                      4. list
- H.** To divide a browser's display area for displaying multiple files, \_\_\_\_\_ is used.  
 1. <body>                      2. <frameset>                      3. <frame>                      4. None of these
- I.** To align some text on the center of the screen in Microsoft Frontpage 2003, \_\_\_\_\_ shortcut is used  
 1. Ctrl + A                      2. Ctrl + E                      3. Ctrl + L                      4. Ctrl + O
- J.** \_\_\_\_\_ dropdown on the Formatting toolbar in Microsoft Frontpage 2003 contains options of creating H1 to H6, Lists, etc.  
 1. Font                      2. Style                      3. Font                      4. None of these

**Q.2 Answer the Following: [ANY TEN]**

[20]

- A.** Explain the terms Web server and Web client
- B.** List the basic buttons of the Standard buttons bar of Internet Explorer.
- C.** List the menu options available under Edit menu of Internet Explorer.
- D.** Write a note on <p> tag in HTML with its attribute giving a suitable example.
- E.** List any 5 Logical character formatting tags in HTML with their names.
- F.** Explain the Link coloring attributes of <body> tag in HTML with an example.
- G.** Explain the rowspan attribute of <td> in HTML with proper examples.
- H.** List the possible type values available with Ordered List in HTML with their names.
- I.** Explain the <frameset> tag in HTML with its attributes taking a proper example.
- J.** Write the steps of inserting <P> in Microsoft Frontpage 2003. Also mention steps of how to modify its attribute.
- K.** List the attributes associated with a Checkbox control in HTML.
- L.** List and explain the attributes of the <form> tag in HTML.

Q.3

- a. Write a note on the E-Mail Internet services. [05]  
b. Write a note on the Toolbars of the Internet Explorer. [05]

OR

- a. Write a note on the FTP Internet services. [05]  
b. Write a note on General Tab of the Internet Explorer options. [05]

Q.4

- a. Write a note on Special characters / entities in HTML. [05]  
b. List and explain those tags which do not have a closing tag in HTML. [05]

OR

- a. Explain <HR> tag in HTML with all its attributes with a proper example. [05]  
b. Explain <FONT> tag in HTML with all its attributes with a proper example. [05]

Q.5

- a. Write a note on <table> tag in HTML giving all the tags and attributes with an example. [10]

OR

- a. Write a note on Ordered and Unordered lists in HTML giving all the tags and attributes with proper example for each. [10]

Q.6

- a. Explain the Dropdown control in HTML form with all the required tags and attributes giving a proper example. [05]

- b. Write a note on Features of Microsoft Frontpage 2003 [05]

OR

- a. Explain the Push button controls in HTML form with all the required tags and attributes giving a proper example. [05]

- b. Write a note on the Formatting toolbar of Microsoft Frontpage 2003 [05]

\*\*\*\*\*Best Of Luck\*\*\*\*\*

[04]

Total No. Of Printed Pages :03

SARDAR PATEL UNIVERSITY  
1<sup>st</sup> SEMISTER BCA EXAMINATION- 2011  
US 01 E BCA 01: DIGITAL COMPUTER ELECTRONICS  
9<sup>th</sup> November 2011, Wednesday

Time: 10:30 to 1:30

Total Marks: 70

**Q1. Answer the following questions.**

[10]

- 1 An invert gate is also called \_\_\_\_\_ gate.
  - a)NOR
  - b)NOT
  - c)AND
  - d)NOR
- 2 An AND gate is physical realization of \_\_\_\_\_ logical operation.
  - a)Addition
  - b)Multiplication
  - c)Division
  - d)Subtraction
- 3 If the input variable are 3 then how many possible combination of output in truth table? \_\_\_\_\_
  - a)3
  - b)4
  - c)8
  - d)12
- 4 In K-map pair eliminates \_\_\_\_\_ variables.
  - a)one
  - b)two
  - c)three
  - d)four
- 5 A relationship between function and its binary variable can be represented by \_\_\_\_\_.
  - a)Encoder
  - b)Decoder
  - c)Truth table
  - d)Multiplexer
- 6 How many control words are used in 8x1 multiplexer? \_\_\_\_\_.
  - a)1
  - b)4
  - c)8
  - d)3
- 7 \_\_\_\_\_ no. of gates are required to construct min size half adder.
  - a)1
  - b)2
  - c)3
  - d)4

- 8 Ring counter producing words with 1 high bit, which shifts \_\_\_\_\_ position per clock pulse.
- one
  - two
  - three
  - none
- 9 A register is a group of \_\_\_\_\_ that work as a unit.
- gates
  - flip-flop
  - Encoder
  - Decoder
- 10 In half adder output of XOR gate is \_\_\_\_\_.
- carry
  - sum
  - remainder
  - none

**Q2. Answer the following question.(Any 10) [20]**

- 1 Explain **AND** gate with truth table and block diagram.
- 2 Draw truth table for any one **De'Morgans theorem**.
- 3 Draw truth table for :  $(A'B + AB'), C'$
- 4 Define **Pair** and **Quade** in K-map.
- 5 Explain **distributive law** of Boolean algebra.
- 6 Draw block diagram and explain **half adder** in short.
- 7 Draw 3 variable karnaugh map by taking simple example.
- 8 Write a note on **D-flip flop**.
- 9 Draw circuit diagram for **4 X 1 multiplexer**.
- 10 Explain **Shift left register** by taking an example.
- 11 Define **sum of product**.
- 12 Draw circuit diagram for **4 X 2 encoder**.

- Q3. (A) Explain XOR gate with circuit diagram and truth table. [03]  
 (B) Prove that  $ABC' + ABC = AB$  using truth table. [03]  
 (C) Explain De'Morgans first theorem and also prove the same. [04]

**OR**

- Q3.(A) Explain NOR gate with circuit diagram and truth table. [03]  
 (B) Simplify this Boolean expression and draw circuit:  $ABC' + ABC + A'BC$  [03]  
 (C) Explain De'Morgans second theorem and also prove the same. [04]

- Q4. (A) What is K-map? Explain the same by taking example of 4 variable K-map. [05]  
 (B) Explain 8 X 3 encoder in detail. [05]

**OR**

- Q4. (A) Explain Pairs, Quad and Octet in context of K-map. [05]  
(B) Explain 3 X 8 decoder in detail. [05]

- Q5. (A) Write a detail note on Binary Full Adder. [06]  
(B) Write a note on multiplexer. [04]

**OR**

- Q5. (A) Write a detail note on Binary Subtraction. [06]  
(B) Write a note on comparator. [04]

- Q6. (A) Write a brief note on Shift Registers with circuit and timing diagram [10]  
by taking an appropriate example.

**OR**

- Q6. (A) Write a brief note on Ring counter using circuit diagram and timing [10]  
diagram.

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[5]

No. of Printed Pages: 2

## SARDAR PATEL UNIVERSITY

External Examination FYBCA

USCIEBCA02 – Information Technology in Business

Date: 9/11/2011

Time: 10:30 to 1:30

Max marks: 70

**Note: Answers of all the questions (including multiple questions) should be written in the provided answer book only.**

**Q.1 Multiple choice question (All question carry equal marks) [10]**

- 1) Which of the following is a resource of information system?  
(A) People (B) data  
(C) network (D) all of above
- 2) \_\_\_\_\_ programs controls and supports the operations of a computer system.  
(A) operating system (B) payroll  
(C) word processing (D) all of the above
- 3) Payroll is a \_\_\_\_\_ program.  
(A) system (B) procedure  
(C) function (D) application
- 4) \_\_\_\_\_ is defined as a set of interrelated components, with a clearly defined boundary, working together to achieve a common set of objectives  
(A) system (B) software  
(C) database (D) internet
- 5) \_\_\_\_\_ system forecast & many cash position.  
(A) Cash Management (B) Invest Management  
(C) Capital Budgeting (D) None of above
- 6) Objectives of computers – based systems in manufacturing are \_\_\_\_\_, \_\_\_\_\_ & \_\_\_\_\_.  
(A) Simplify , Automate , Integrate  
(B) Sales , Marketing , Production  
(C) Information , Control , Management  
(D) None of the above
- 7) \_\_\_\_\_ Marketing has become an important tool in developing advertising & promotion strategies for a company's E – commerce websites  
(A) Interactive (B) Targeted  
(C) Sales force automation (D) None of the above
- 8) Online auction websites are the examples of \_\_\_\_\_ E-commerce Category.  
(A) B2C (B) B2B (C) C2C (D) None of the above
- 9) \_\_\_\_\_ serves as a framework to integrate and automate many of the Business process.  
(A) ERP (B) CRM (C) SCM (D) None of the above.
- 10) Customer service and support is an application area of \_\_\_\_\_.  
(A) ERP (B) CRM (C) SCM (D) None of the above.

- Q.2 Write a short answers (Attempt any 10) . All question carry equal marks [20]**
- 1) What is information system?
  - 2) Draw a data pyramid for management perspective
  - 3) Explain the meaning of DSS, TPS and MIS
  - 4) Who are end users for information system/
  - 5) Draw information system model.
  - 6) What is the difference between Information system and Information technology?
  - 7) Discuss in brief Accounts Receivable and Payable.
  - 8) List major components of Targeted Marketing and explain any one of them.
  - 9) Discuss the objectives of computer-based systems
  - 10) Discuss B2B E-commerce.
  - 11) What is the use of ERP?
  - 12) Write a short note on CRM.
- Q.3 [A] Explain Data pyramid in detail. [5]**  
**[B] What is Transaction processing System ? Explain in detail [5]**  
**OR**  
**[A] Explain Data pyramid in detail. [5]**  
**[B] Explain Information System activities. [5]**
- Q.4 [A] Explain managerial challenges of IT. [5]**  
**[B] Write down the important qualities of Information quality. [5]**  
**OR**  
**[A] How strategic advantage in the business can be gained using Information Technology? [6]**  
**[B] Write a difference between data and information. [4]**
- Q.5 [A] Discuss HRM with following functions: [6]**  
 (a) HRM and the Internet  
 (b)HRM and the Corporate Intranets  
**[B] Write a note on Capital budgeting [4]**  
**OR**  
**[A] Discuss Accounting System with following functions: [6]**  
 (a) Order Processing  
 (b) Inventory Control  
**[B] Write a note on payroll system [4]**
- Q.6 [A] What is CRM ? Explain application areas of CRM [6]**  
**[B] Discuss B2B and B2C e-commerce in brief. [4]**  
**OR**  
**[A] Explain SCM in details. [6]**  
**[B] What E-commerce ? Explain the advanges of E-commerce [4]**

✕ = ✕ = ✕

[03]  
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No. of Printed Pages: 3

F.Y.B.C.A.(1<sup>ST</sup> SEMESTER) (CBCS)

November-2011

Subject : Mathematics I

Paper : US01FBCA02

Time : 10.30 to 12.30.

Date : 08/11/2011

Marks : 70

Q : 1

Select the correct option for each of the following

[10]

- 1  $A \cup (A \cap B) = \text{-----}$   

(a) U	(b) A	(c) B	(d) none
-------	-------	-------	----------
- 2  $(A \cup B)' = \text{-----}$   

(a) $(A \cap B)$	(b) $A'$	(c) $A' \cap B'$	(d) none
------------------	----------	------------------	----------
- 3 A function  $f : A \rightarrow B$  is said to be ----- if different elements in the domain A have distinct images  

(a) onto	(b) invertible	(c) one to one	(d) bijective
----------	----------------	----------------	---------------
- 4 The operation  $*$  is commutative if  

(a) $(a*b)*c = a*(b*c)$	(b) $(a*b) = (b*a)$	(c) $(a*e) = a$	(d) none
-------------------------	---------------------	-----------------	----------
- 5 The matrix A is called orthogonal if  $A' = \text{-----}$   

(a) $A^{-1}$	(b) A	(c) $-A$	(d) none
--------------	-------	----------	----------
- 6 A is skew symmetric matrix if  $A' = \text{-----}$   

(a) $A^{-1}$	(b) A	(c) $-A$	(d) none
--------------	-------	----------	----------
- 7 If  $u = (3, -7, 2)$ ,  $v = (-3, 0, 2)$  then  $u \cdot v = \text{-----}$   

(a) 13	(b) -13	(c) -5	(d) 5
--------	---------	--------	-------
- 8 The median for grouped frequency distribution is given by  

(a) $l + \frac{h}{f} \left( \frac{N}{2} - c.f. \right)$	(b) $l + \frac{h}{f} \left( \frac{n}{2} - c.f. \right)$	(c) $l + \frac{h}{f} \left( \frac{N}{4} - c.f. \right)$	(d) none
---	---	---	----------
- 9 The observation whose frequency is highest is called  

(a) mean	(b) median	(c) mode	(d) none
----------	------------	----------	----------
- 10  $D = \text{diag}(d_{ij})$  is diagonal if its ----- elements are all zero  

(a) diagonal	(b) non diagonal	(c) all	(d) none
--------------	------------------	---------	----------

Q ; 2

Do as directed ( Attempt any 10)

20

- 1 Find the power set of  $A = \{ 1, 2, 3, 4 \}$
- 2 Let the function f and g be defined by  $f(x) = 2x + 1$  and  $g(x) = x^2 - 2$ . Find fog and gof.
- 3 Define Duality. Find duality of  $(X \cap Y)' = X' \cup Y'$
- 4 Let  $A = \{2, 3\}$ . Is A closed under : (i) addition (ii) multiplication?
- 5 Define group homomorphism and Kernel
- 6 Determine k such that  $\| u \| = \sqrt{39}$ , where  $u = ( 1, k, -5, -3)$
- 7 Find x and A if  $A = \begin{pmatrix} 4 & x+2 \\ 2x-3 & x+1 \end{pmatrix}$  is symmetric.
- 8 Find x and y if  $x(1, 1) + y(2, -1) = (1, 4)$
- 9 Find the determinant of  $\begin{pmatrix} a-b & a \\ a & a+b \end{pmatrix}$  and  $\begin{pmatrix} 5 & 4 \\ 2 & 3 \end{pmatrix}$ .
- 10 If  $\vec{u} = (2, 5, 7)$ ,  $\vec{v} = (-3, 7, 3)$  and  $\vec{w} = (2, -4, 2)$  then find  $4\vec{u} - 3\vec{v} - 5\vec{w}$ .

- 11 The intelligent quotients (IQ's) of 10 boys is given below  
100,107,83,85,83,70,80,110,91,88. Find mean IQ.
- 12 The following data indicate the number of children of 30 families.  
Prepare the frequency distribution based on the data

1	2	0	3	1	1	2	2	2	3
0	2	1	1	0	2	3	2	2	1
0	2	2	3	2	1	1	0	2	1

Q:3 (a) Prove that [4]

$$P(n) = 1+2+3+ \dots + n = \frac{n(n+1)}{2}$$

(b) Let the function f and g be defined by  $f(x) = 2x + 1$  and  $g(x) = x^2 - 2$  respectively. Find (i)  $f \circ g(4)$  and  $g \circ f(4)$ . (ii)  $f \circ g(a + 2)$  and  $g \circ f(a + 2)$ . (iii)  $f \circ g(a + 5)$ . [3]

(c) Calculate  $7!$ , using recursive formula. [3]

OR

Q:3 (a) find the formula for the inverse of  $h(x) = \frac{2x-3}{5x-7}$ . [3]

(b) Define the following functions: [3]  
(i) one to one (ii) onto (iii) bijective [4]

(c) If Q is defined by [4]  
 $Q(a,b) = 0$ , if  $a < b$   
 $= Q(a-b,b) + 1$ , if  $a \geq b$   
then find  $Q(2,3)$ ,  $Q(19,3)$  and  $Q(703,4)$ . [4]

Q:4 (a) Prove that in a ring R [4]

(i)  $a \cdot 0 = 0 \cdot a = 0$  (ii)  $a(-b) = (-a)b = -ab$  [3]

(b) Consider the set N of positive integers. And let \* be the operation of l.c.m on N so find (i)  $4 * 6$ ,  $3 * 5$ ,  $9 * 18$ ,  $1 * 6$  [3]  
(ii) Is  $(N, *)$  a semigroup?  
(iii) Is l.c.m operation commutative?

(c) Define the terms (i) group (ii) semigroup (iii) monoid. [3]

OR

Q:4 (a) Define : Ring [3]

(b) Show that the left and right cancellation laws hold in a Group G. [4]

(c) Consider the set of rationales defined by  $a * b = a + b - ab$ . [3]  
Find  $(7 * \frac{1}{2})$ . Is  $(Q, *)$  semigroup? Is it commutative?

*Paul*  
*8/11/2014*

- Q: 5 (a) Define the following terms: [3]  
 (i) Skew-symmetric matrix (ii) Orthogonal matrix (iii) Lower triangular matrix

- (b) Find (i)  $A^T$  (ii)  $B^T$  (iii)  $(AB)^T$  if [4]

$$(i) A = \begin{pmatrix} 0 & 5 & -2 \\ -5 & 0 & 3 \\ 2 & -3 & 0 \end{pmatrix} \quad (ii) B = \begin{pmatrix} 1 & -5 & 3 & 2 \\ 4 & -1 & 4 & 4 \\ 4 & -6 & 5 & 8 \end{pmatrix}$$

- (c) Consider  $\vec{u} = (1, -2, 3, 4)$ ,  $\vec{v} = (-2, 4, 5, -3)$ ,  $\vec{w} = (5, -5, -3, 4)$  and  $\vec{z} = (2, 7, 4, -2)$ . [3]  
 Find the followings : (i)  $2\vec{u} - 4\vec{w}$  (ii)  $2\vec{v} + 5\vec{z}$  (iii)  $\vec{u} \cdot \vec{v}$ .

OR

- Q: 5 (a) Solve by using determinants :  $2x - 3y = 7$  [3]  
 $3x + 5y = 1$

- (b) Find x, y, z, and t if  $A = \begin{pmatrix} 5 & 2 & x \\ y & z & -3 \\ 4 & t & -7 \end{pmatrix}$  is symmetric. [3]

- (c) Find x, y, z and t, if  $3 \begin{pmatrix} x & y \\ z & t \end{pmatrix} = \begin{pmatrix} x & 6 \\ -1 & 2t \end{pmatrix} + \begin{pmatrix} 4 & x+y \\ z+t & 3 \end{pmatrix}$ . [4]

- Q: 6 (a) Calculate mean and mode for the following data: [6]

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of Students	2	6	5	15	7	6	3

- (b) In a survey, it was found that 64 families bought milk in the following quantities (liters) in a particular week. [4]

19	24	20	34	11	39	28	8
6	24	25	26	31	20	23	12
10	23	11	21	12	18	13	23
14	36	32	21	17	33	23	18
13	21	17	22	7	30	14	20
22	27	9	7	5	16	28	29
15	22	18	10	37	19	24	15
16	16	21	22	17	25	26	9

Convert the above data into frequency distribution using exclusive method with 5 as a length of interval.

OR

- Q: 6 (a) The following table shows the frequency distribution of the number of [4]  
 telephone calls received in 245 successive one-minute interval at an exchange.

No. of calls :	0	1	2	3	4	5	6	7
Frequency :	14	21	25	43	51	40	39	12

Find the mean number of calls per minute.

- (b) Calculate harmonic mean and geometric mean for the following data [6]

class	0-10	10-20	20-30	30-40	40-50	50-60	60-70
frequency	2	6	15	28	13	8	4

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