Roll No. 410931

January 2010

Bachelor of Computer Application (BCA) Examination

First Semester

BCA - 101 : Mathematics - I

Time : 3 Hours Max. Marks 60

Note : Solve any two parts from each question . Each question carries equal marks :

Q.1. (a) Discuss different types of functions with suitable examples 06

(b) Evaluate $\lim_{x \to 0} \frac{10^x - 2^x - 5^x + 1}{x^2}$ 06

(c) Show that $f(x) = \frac{x^3 - 27}{x - 3}$ is discontinuous at $x = 3$. 06

If $x = 3$ then show that $f(3) = 27$.

Q.2 (a) Expand function $f(x, y) = x^2 + xy + y^2$ in powers of $(x - 2)$ and $(y - 3)$ 06

(b) Expand the following functions by Maclaurin's Theorem : 06

(i) a^x (ii) e^x

(c) Verify Rolle's Theorem for the function $f(x) = x^2$ in the interval $[-1, 1]$ 06

Q.3 (a) Find the points on the curve $y = \sin x$, where the tangents are parallel to x - axis. 06

(b) Find all the asymptotes of the curve 06

$xy(x^2 - y^2)(x^2 - 4y^2) + xy(x^2 - y^2) + x^2 + y^2 - 7 = 0$

(c) Evaluate $\int \frac{\cos h\, x + \sin h\, x \sin x}{1 + \cos x}\, dx$ 06

Q.4 (a) The necessary and sufficient condition for the vector $a(t)$ to have 06

constant direction is $a \times \frac{da}{dt} = 0$

(b) Find the directional derivative of $\phi = xyz$ at the point $(1, 1, 1)$ in the directions : 06

(i) $\hat{i}$ (ii) $-\hat{j}$ (iii) $\hat{i} + \hat{j} + \hat{k}$

P. T. O.

(c) If $f = xy^2 \hat{i} + 2x^2yz \hat{j} - 2yz^2 \hat{k}$,
find (i) div f (ii) curl f 06

Q.5 (a) If $A = \begin{bmatrix} 1 & 0 & -2 \\ 2 & 2 & 4 \\ 0 & 0 & 2 \end{bmatrix}$ 06

Then verify $A^2 - 3A + 2I = 0$ and hence find A^{-1}.

(b) Solve the following system of equations using elementary row transformation : 06

$$\begin{aligned} x_1 + 2x_3 &= 16 \\ 2x_1 + x_2 &= 13 \\ 3x_1 + x_2 + x_3 &= 13 \end{aligned}$$

(c) Find the rank of the following matrix : 06

(i) $A = \begin{bmatrix} 1 & 0 & 2 \\ 2 & 1 & 0 \\ 3 & 1 & 1 \end{bmatrix}$ (ii) $B = \begin{bmatrix} 2 & 0 & 1 \\ 3 & 2 & 1 \end{bmatrix}$

Roll No..... 410932

January 2010

Bachelor of Computer Application (BCA) Examination

First Semester

BCA-102: Statistical Methods - I

Time: 3 Hours Max. Marks: 60

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

1. (a) Define Data, Primary Data, Secondary Data, Methods of collecting Primary and Secondary Data.
(b) What do you mean by Tabulation of Data? Discuss essential parts of a good Table. Following is the distribution of 70 students in a test:

Marks (Less than)	10	20	30	40	50
No. of Students	3	8	17	20	22

From the above data, form a frequency table. Also find the number of students securing more than 30 marks.
(c) Draw a less than ogive for the following frequency distribution:

I Q	60-70	70-80	80-90	90-100	100-110	110-120	120-130
No. of Students	20	22	26	30	28	21	16

2. (a) Mean of the following frequency table is 50. But the frequencies f_1 and f_2 in classes 20-40 and 60-80 are missing. Find the missing frequencies:

Class	0-20	20-40	40-60	60-80	80-100	Total
Frequency	17	f_1	32	f_2	19	120

(b) Find Median & Mode of following distribution:

Production per day (in Tons)	21-22	23-24	25-26	27-28	29-30
Number of Days	7	13	22	10	8

(c) A student obtained Mean and S.D. of 100 observations as 40 and 5.1 respectively. It was later discovered that he had wrongly copied down an observation 50 instead of 40. Calculate correct Mean and Standard Deviation.

3. (a) Calculate first four moments about Mean of the following distribution and hence find $\beta 1$ and $\beta 2$.

X:	0	1	2	3	4	5	6	7	8
f:	1	8	28	56	70	56	28	8	1

(b) Find Coefficient of Skewness for the following:

Wages (Rs.)	4.5	5.5	6.5	7.5	8.5	9.5	10.5	11.5
No of workers	35	40	48	100	125	87	43	22

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(c) A man is known to speak truth 3 out of 4 times. He throws a die and reports that it is a six. Find the probability that it is actually a six.

4. (a) An experiment succeeds twice as often as it fails. What is the probability that in next five trails there will be:
   (i) Three successes (ii) At least three successes

   (b) If 5% of electric bulbs manufactured by a company are defective, use Poisson Distribution to find the probability that in a sample of 100 bulbs, 5 will defective. [Given: $e^{-5} = 0.007$]

   (c) The consumer accounts at a certain departmental store have an average balance of Rs. 480 and a Standard Deviation of Rs. 160. Assuming that the account balances are normally distributed:
   (i) What proportion of the accounts is over Rs. 600?
   (ii) What proportion of accounts is between Rs. 400 and Rs. 600?

5. (a) Ten students got the following percentage of marks in Mathematics and Physics. Find Coefficient of Rank Correlation.

Mathematics (x)	8	36	98	25	75	82	92	62	65	35
Physics (y)	84	51	91	60	68	62	86	58	35	49

   (b) Define the following with suitable examples:
   (i) Positive correlation
   (ii) Negative Correlation
   (iii) Perfect Correlation
   (iv) Regression
   (v) No correlation
   (vi) Curvilinear Correlation.

   (c) Given the following Bivariate data:

X	1	5	3	2	1	1	7	3
Y	6	1	0	0	1	2	1	5

   (i) Fit a regression line of Y on X and hence find X if Y = 2
   (ii) Fit a regression line of X on Y and predict Y if X = 5

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Bachelor of Computer Application (BCA) Examination

First Semester

BCA-103: Physics-I

Time: 3 Hours Max. Marks: 60

Note: All questions are compulsory. Solve any two parts from each question. All question carry equal marks.

1. (a) Explain Electric Dipole. Derive expression for potential due to electric dipole.
   (b) Establish relationship between Dielectric Polarization (P), Dielectric Constant (k) and Electric Field Intensity (E). Explain Dielectric Polarization in polar & non-polar molecule.
   (c) Two similar charges are observed to repel each other with a force of 4.5 Kg weight when placed 0.03 Meter apart in air. Calculate the strength of charges.

2. (a) What is meant by Hysteresis? Show that the area of a B-H curve denotes the energy dissipated per cubic meter of material during each cycle of magnetization.
   (b) What are the characteristics of Para, Dia and Ferromagnetic substances? Explain with example.
   (c) Describe a method to determine the susceptibility of Ferromagnetic material.

3 (a) Define RMS Value and Mean Value for A.C. quantities. Obtain relation between I_{RMS} and I_{MAX}.
   (b) Explain the series resonance in LCR circuit and derive expression for resonant frequency. Distinguish between series and parallel resonant circuits.
   (c) A condenser of capacity 20 μF is first charged to potential difference of 15,000 Volts and then is short circuited with a coil of negligible resistance and self inductance of 0.04 Henry. Calculate frequency of oscillations and maximum amplitude of the resultant current.

4 (a) Explain formation of carbon resistor. How one can determine the value of resistance using color code? Explain with example.
   (b) State and prove Nortons's theorem.
   (c) What is maximum power transfer theorem? Show that the minimum electric power consumed in internal impedance of generator is equal to maximum power transfer on load.

5 (a) Why energy gap is essential concept in semiconductors? Give short note on Tunnel Diode and LED.
   (b) Explain P-N Junction as rectifier. Discuss depletion layer.
   (c) What is Zener Diode? Explain working with the help of characteristic curve and discuss.

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Bachelor of Computer Application (BCA) Examination

First Semester

BCA-104: Programming & Problem Solving Through C-1

Time: 3 Hours

Max. Marks: 60

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

1. (a) Differentiate between Structured and Modular Programming.
   (b) Design an algorithm for finding maximum of three numbers.
   (c) Illustrate the characteristics of efficient program development in C Language.

2. (a) In b = 6.6/a + (2*a + (3*c) / a*d) / (z / n); which operation will be performed first and why?
   (b) What do you mean by Data Type in C? Explain various Data Types available in C Language with Example.
   (c) Explain the rules that are used for the implicit conversion of Floating Point and Integer Value.

3 (a) Write a program to check whether the given number is prime or not.
   (b) Write a program to reverse the digits of the given number.
   (c) Differentiate between While Loop and Do-While Loop with Example.

4 (a) Write a program to sort all the elements of a 4*4 Matrix.
   (b) Write a program to count the numbers of characters present in any String.
   (c) Point out the errors, if any, in the following program:

```
Main ( )
 {
      int array [6] = {1,2,3,4,5,6};
      for (i = 0; i<=25; i++)
            Printf (11 / n %d", array [i]);
 }
```

5 (a) Explain the features of Structure in C Language.
   (b) What are Macros? Explain with Example.
   (c) Explain the following terms:
   (i) # define
   (ii) # ifdef

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Bachelor of Computer Application (BCA) Examination

First Semester

BCA-105: PC Software

Time: 3 Hours Max. Marks: 60

Note: Attempt all questions. All questions carry equal marks.

1. (a) Explain Von Neumann Model of Computer.
   (b) Explain different types of Printers.

   OR

   (a) Convert the following Number Systems:
   (i) Binary Number $(1101.1101)_2$ to Octal Number ($)_8$
   (ii) Hexadecimal Number $(A2.B1)_{16}$ to Binary Number ($)_2$
   (b) Explain BCD, EBCDIC and ASCII codes with Examples.

2. (a) Explain different types of Operating Systems.
   (b) Difference between COM, EXE and BAT Files.

   OR

   (a) Write any 10 Internal Commands of DOS with proper Syntax and Example.
   (b) Explain the booting process of DOS.

3. (a) Explain the utility of Recycle Bin, My Computer and My Documents in Windows Operating System.
   (b) Explain various features of Windows 2000.

   OR

   (a) Write down various steps of Printer Installation in Windows Operating System.
   (b) Write in short about the following:
   (i) Network Neighbourhood
   (ii) Control Panel
   (iii) Display Properties

4. (a) Write the steps of Mail Merge in MS-Word.
   (b) How can we Insert Pictures in MS-word file?

   OR

   (a) Explain the following terms:
   (i) Header & Footer
   (ii) Foot Note & End Note
   (b) Explain the Standard Toolbar of MS-Word.

5. (a) Explain the different Presentation Styles available in MS-Power Point?
   (b) Write the steps to Copy or Move the Slides in a Presentation?

   OR

   (a) Explain the different Slide views available in a Power Point Presentation.
   (b) Explain the following terms:
   (i) Custom Animation
   (ii) Slide Sorter
   (iii) Slide Transaction

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January 2010

Bachelor of Computer Application (BCA) Examination

First Semester

BCA-106: ENGLISH

Time: 3 Hours Max. Marks: 60

Note: All parts of particular question should be answered at one place only. All questions are compulsory and carry equal marks.

1. Answer the following questions in one sentence only: (Any Eight)
   (a) What is meant by the expression "Knowledge is Free"?
   (b) What Gods make the Hindu Trinity?
   (c) Which quality of Mahatma Gandhi influenced the West most?
   (d) What did the Katha Upanishad speak about the body of man?
   (e) What is the content of the Atharva Veda?
   (f) What should human beings accept with equanimity?
   (g) Who were called the Extremists?
   (h) How many days it take the satyagrahis to reach Dandi?
   (i) Which are the two most important aspects of Indian Constitution?
   (j) How can social progress be achieved?
   (k) What does the Universal Declaration of Human Rights say regarding duties?
   (l) Where did Ghalib's wife send her jewels and valuables?

2. (i) Read the following passage carefully and answer the questions given below:

One of the most famous monuments in the world, the Statue of Liberty, was presented to the United States of America by the people of France. The great statue, which was designed by the sculptor Auguste Bartholdi, took ten years to complete. The actual figure was made of copper supported by a metal framework which had been specially constructed by Eiffel. Before it could be transported to the United States, a site had to be found for it and pedestal had to be built. The site chosen was an island at the entrance of the New York Harbour. By 1884, a statue which was 151 feet tall, had been erected in Paris. The following year, it was taken to pieces and sent to America. By the end of October, 1886, the statue had been put together again and it was officially presented to American people by Bartholdi. Ever since then, the great monument has been a symbol of liberty for the millions of people who have passed through New York Harbour to make their homes in America.

Questions:

1. Where is the Statue of Liberty exactly installed?
2. By whom was it presented to the United States of America?
3. Which parts of the monument were built in Paris?
4. Of what has the great monument been a symbol ever since its erection?

2. (ii) Provide synonyms of the following words: (Any two)
   (i) Ancient (ii) Basic (iii) Custom (iv) Obtain
   Make nouns of the given adjectives: (Any two)
   (i) Wise (ii) Honest (iii) Simple (iv) Beautiful

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3. Write a paragraph on any one of the following in 200 words:
   (i) Fusion of cultures in Indian art
   (ii) Advantages of having green trees around us
   (iii) Gandhi's First Fast
   (iv) Regionalism in India

4. Write an application to the Registrar of your University asking him for an early declaration of result.

   OR

   Write a letter to your friend in New York describing the cultural heritage of your country.

5. Do as directed: (Any Eight)
   (a) Children_____ (love) to play cricket. (Use present indefinite)
   (b) By the time the ambulance (arrive) the patient (die). (Use appropriate past tense)
   (c) This milk is very hot; I can't drink it. (Use too / enough)
   (d) He will come _____ you write to him. (Use if / unless)
   (e) How _____ you insult him? (Supply suitable modal)
   (f) "Do you want tea or coffee?" the bearer asked. (Change the narration)
   (g) The rain stopped. The play resumed. (Combine these two simple sentences into one simple sentence)
   (h) Bulldozers remove the top soil. (Change the Voice)
   (i) She cut the grass _____ a scythe. (Insert a preposition)
   (j) I cut _____ with the razor this morning. (Use appropriate possessive or 'self' form)
   (k) There is _____ fly in _____ lemonade. (Supply appropriate determiners)
   (l) Use <u>any two</u> of the following phrases in sentences of your own.
      (i) Brought about
      (ii) Make provision for
      (iii) Look forward to
      (iv) Set up