Seat
No.

B.C.S. (Part - I) (Semester - II) Examination, April - 2016
MATHEMATICS
Calculus (Paper - IV)
Sub. Code : 59705

Day and Date : Thursday, 07 - 04 - 2016   **Total Marks : 50**
Time : 12.00 noon to 2.00 p.m.

Instructions :   1)   All questions are compulsory.
                   2)   Figures to the right indicate full marks.

Q1) Select correct alternative for each of the following: **[10]**

a)   The sequence $\{5^n\}_{n=1}^{\infty}$ _____.

   i)   converges to 5   ii)   converges to –5

   iii)   diverges to ∞   iv)   diverges to –∞

b)   The sequence $\left\{\left(-\dfrac{3}{4}\right)^n\right\}_{n=1}^{\infty}$ _____.

   i)   is convergent   ii)   diverges to ∞

   iii)   diverges to –∞   iv)   is oscillatory

c)   The series $\sum\limits_{n=1}^{\infty}\dfrac{1}{n^p}$, diverges if _____.

   i) $p > 1$ ii) $p < 1$

   iii) $p \leq 1$ iv) $p = 1$

P.T.O.

i) If $y =$

d) If $\sum_{n=1}^{\infty} a_n$ is series of positive terms and $\lim_{n \to \infty} \sqrt[n]{a_n} = l$, then the seri convergent if _____.

i) $l > 0$ ii) $l < 1$

iii) $l > 1$ iv) $l = 1$

e) Every continuous function on a closed interval is _____.

i) bounded   ii) not bounded

iii) differentiable   iv) none of these

f) Value of 'c' in conclusion of Rolle's theorem for $f(x) = x^2 - (3.5)x$ [1, 2] is _____.

i) 1   ii) 2

iii) 1.5   iv) 1.75

g) $\lim_{x \to 1} \dfrac{\sin x}{x} = $ _____.

i) 1   ii) e

iii) -1 iv) $\dfrac{1}{e}$

h) if $y = e^{ax}$ then $y_n = $ _____.

i) e^x ii) e^{ax}

iii) $a^n e^{5x}$ iv) $a^n e^x$

i) If $y = 2 \sin x \cos x$ then $y_n =$ _____.

i) $2^n \sin\left(2x + \dfrac{n\pi}{2}\right)$ ii) $2^n \cos\left(2x + \dfrac{n\pi}{2}\right)$

iii) $2^{n-1} \sin\left(2x + \dfrac{n\pi}{2}\right)$ iv) $2^{n-1} \cos\left(2x + \dfrac{n\pi}{2}\right)$

j) The Cauchy's form of remainder after n terms in Maclaurin's theorem is given by _____.

i) $R_n = \dfrac{(b-c)^{n-1}}{(n-1)!}(b-a) f^n(c)$

ii) $R_n = \dfrac{x^n}{n!} f^n(\theta x)$

iii) $R_n = \dfrac{h^n (1-\theta)^{n-1}}{(n-1)!} f^n(a+\theta h)$

iv) $R_n = \dfrac{(b-a)^n}{n!} f^n(c)$

Q2) Attempt any two of the following: [20]

a) State & prove Cauchy's mean value theorem.

b) State & prove Leibnitz theorem.

c) Show that the sequence $\left\{\left(1+\dfrac{1}{n}\right)^n\right\}$ is convergent.

Q3) Attempt any four of the following:

a) If $y = \cos(m \sin^{-1} x)$ then show that

$$(1-x^2)y_{n+2} - (2n+1)xy_{n+1} - (n^2+m^2)y_n = 0.$$

b) Discuss the convergence of the sequence $\sqrt{5}, \sqrt{5\sqrt{5}}, \sqrt{5\sqrt{5\sqrt{5}}}$,

c) Discuss the convergence of the series $\sum_{n=1}^{\infty} \dfrac{n^n}{n!}$.

d) Verify Rolle's theorem for $f(x) = 2x^3 + x^2 - 4x - 2$ in $\left[-\sqrt{2}, \sqrt{2}\right]$

e) Evaluate $\lim\limits_{x \to 0} \dfrac{e^x - e^{-x} - 2\log(1+x)}{x \sin x}$.

f) Expand $\cos x$ in powers of x.

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Total No. of Pages : 3

B.C.S. (Part - I) (Semester - I) Examination, March - 2016
MATHEMATICS (Paper - II)
Algebra
Sub. Code : 59697

Day and Date : Tuesday, 29 - 03 - 2016   **Total Marks :50**

Time : 12.00 noon to 02.00 p.m.

Instructions : 1)   **All questions are compulsory.**
                2)   **Figures to the right indicate full marks.**
                3)   **Use of calculator is allowed.**

Q1) Select correct alternative for each of the following.   **[10]**

i)   If set A has m elements and set B has n elements. Then the power set
     $P(A \times B)$ has _____ elements.

     a) mn b) m^n

     c) n^m d) 2^{mn}

ii) A relation R is said to be _____ if it is reflexive, anti-symmetric
     and transitive .

     a)   Equivalence relation   b)   Partial ordering relation

     c)   Symmetric relation   d)   Inverse relation

iii) Any two equivalence classes are _____

     a)   disjoint   b)   identical

     c)   not identical   d)   either identical or disjoint

iv) If p is prime, which divides the integer 'a' then g. c. d (p, a) = _____

     a)   a   b)   p

     c)   1   d)   0

P.T.O.

v) There are precisely _____ residue classes modulo 12.

     a)   4   b)   5

     c)   11   d)   12

vi) If p is prime, which does not divide the integer 'a' then _____.

     a) $a^p \equiv 1 \pmod{a}$ b) $a^{p-1} \equiv a \pmod{p}$

     c) $a^p \equiv 1 \pmod{p}$ d) $a^{p-1} \equiv 1 \pmod{p}$

vii) Every element in Boolean algebra have _____.

     a)   no complement

     b)   unique complement

     c)   two complements

     d)   more than two complements

viii) $(D_{30}, \leq)$ be a poset defined by $a \leq b$ *iff* $a/b \, \forall \, a, b \in D_{30}$ then g.l.b. of 2 and 3 is _____.

     a)   2   b)   3

     c)   6   d)   1

ix) For the set $S = \{2, 4, 6, 8\}$ under multiplication modulo 10 as the binary operation, the identity element is _____

     a)   2   b)   4

     c)   6   d)   8

x) If $a * (b * c) = (a * b) * c$, then $*$ is _____.

     a)   commutative   b)   associative

     c)   distributive   d)   idempotent

Q2) Attempt any two of the following . [20]

i) If Z be the set of all integers. For any $a, b \in Z$ relation R is defined as aRb iff $11|(5a + 6b)$. Then show that R is an equivalence relation. Find equivalence class of a.

ii) For any a, b in a Boolean algebra prove that

   (a) $\overline{a \vee b} = \overline{a} \wedge \overline{b}$

   (b) $\overline{a \wedge b} = \overline{a} \vee \overline{b}$

iii) If a, b, c, d, x, y are integers and $a \equiv b \pmod{n}$, $c \equiv d \pmod{n}$ then prove that

   (a) $ax + cy \equiv bx + dy \pmod{n}$

   (b) $ac \equiv bd \pmod{n}$

   (c) $a + c \equiv b + d \pmod{n}$

Q3) Attempt any four of the following: [20]

i) Define prime integer and composite integer, if p is prime and a, b are integers such that $p|ab$ then prove that $p|a$ or $p|b$.

ii) Let R and S be relations defined on set $A = \{1, 2, 3, 4\}$ as , aRb iff $a = b + 1$ & aSb iff $a \leq b$. Find $R \circ S$ and $S \circ R$. Also draw diagraph for $R \circ S$ and $S \circ R$.

iii) On set N of natural numbers define a relation $a \leq b$ iff $a|b$. Show that $(N, \leq)$ is poset.

iv) Show that in distributive lattice, if an element has a complement then it is unique.

v) Define (a) monoid (b) abelian group

vi) Express following elements of Z_3 as $\overline{0}, \overline{1}, \overline{2}$

   a) $\left(\overline{2}\right)^3$

   b) $\overline{100}$

   c) $\left(\overline{-100}\right)^4$

   d) $\overline{10} + \overline{1}$

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B.C.S. (Part - I) (Semester - I) Examination, April - 2016
STATISTICS
Descriptive Statistics - I (Paper - I)
Sub. Code : 59700

Total Marks : 50

Day and Date : Friday, 01 - 04 - 2016
Time : 12.00 noon to 2.00 p.m.

Instructions :   1)   All questions are compulsory.
                   2)   Figures to right indicate full marks.
                   3)   Use of calculator and statistical table is allowed.

[10]

Q1) Choose the correct alternative:

a)   Median of the values 20, 25, 23, 30, 37 is _____.

  i)   30   ii)   27

  iii)   25   iv)   23

b)   Quartiles can be located using _____.

  i)   Frequency polygon   ii)   Histogram

  iii)   Ogive curves   iv)   None of these

c)   For open ended classes we can use _____ measure of dispersion.

  i)   Range   ii)   M.D.

  iii)   Q.D.   iv)   S.D.

d)   The first ordered central moment is equal to _____.

  i)   1   ii)   0

  iii)   Mean   iv)   None of these

P.T.O.

e) If a constant value 50 is added to each observation of a set set is _____.

    i)   Increased by 50   ii)   50 times the origin

    iii)   Decreased by 50   iv)   Not affected

f) Given that $\mu_4 = 24$, $\mu_2 = 3$ then the distribution is _____

    i)   Leptokurtic   ii)   Platykurtic

    iii)   Mesokurtic   iv)   Symmetric

g) _____ is unitless measure.

    i)   Range   ii)   Variance

    iii)   Q.D.   iv)   C.V.

h) Arithmatic mean of first 'n' natural number is _____

    i) $\dfrac{n}{2}$ ii) $\dfrac{n+1}{2}$

    iii) $\dfrac{n-1}{2}$ iv) $\dfrac{(n+1)(2n+1)}{6}$

i) For heterogeneous population, a sample can be drawn usin sampling method.

    i)   SRSWR   ii)   SRSWOR

    iii)   Stratified   iv)   Systematic

j) In exclusive type of classification _____ limits are excluded

    i)   Upper   ii)   Lower

    iii)   Both   iv)   None of these

en mean of **Q2)** Attempt any two of following:

   a)   What is meant by measures of central tendency? Define mean, median and mode. Discuss effect of change of origin and scale on mean.

   b)   Explain the term skewness. Describe different types of measures of skewness.

   c)   Define the different measures of dispersion. State merits and demerits of S.D.

[20]

Q3) Attempt any four of following:

   a)   Write a note on simple random sampling.

   b)   The first three moments about 1 are 2, 25 and 80 respectively. Find mean, s.d. and β_1.

   c)   Explain procedure for construction of ogive curves.

   d)   Discuss effect of change of origin and scale on central moments.

   e)   Compute M.D. about mean for following data.

   120, 180, 380, 410, 330, 350, 420, 480, 310, 280

   f)   For a moderately asymmetric distribution, the values of mean and median are 264 and 276 resp. Estimate value of mode.

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B.C.S. (Part - I) (Semester - I)
Examination, March - 2016
MATHEMATICS
Discrete Mathematics (Paper - I)
Sub. Code : 59696

Day and Date : Monday, 28-03-2016

Total Marks : 50

Time : 12.00 noon to 2.00 p.m.

Instructions :   1)   All questions are compulsory.
                 2)   Figures to the right indicate full marks.
                 3)   Use of calculator is allowed.

Q1) Select correct alternative for each of the following: [10]

a)   The function $f(x) = \dfrac{1}{x}$ defined on set of non zero real numbers is

   i)   one-one but not onto

   ii)   onto but not one - one

   iii) bijective

   iv)   many - one & onto

b)   Recurrence relation corresponding to the sequence 1, 3, 5, 7, ---------- is

   i) $a_n = a_{n-1} + a_{n-2} \quad a_0 = 1 \ \& \ a_1 = 4$

   ii) $a_n = a_{n-1} + 2 \quad a_0 = 1$

   iii) $a_n = 2a_{n-1} \quad a_0 = 1$

   iv) $a_n = 3a_{n-1} \quad a_0 = 1$

P.T.O.

Seat
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B.C.S. (Part - I) (Semester - I)
Examination, March- 2016
MATHEMATICS
Discrete Mathematics (Paper - I)
Sub. Code : 59696

Day and Date : Monday, 28-03-2016

Total Marks : 50

Time : 12.00 noon to 2.00 p.m.

Instructions :
1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of calculator is allowed.

Q1) Select correct alternative for each of the following:　　　　　　　**[10]**

a) The function $f(x) = \dfrac{1}{x}$ defined on set of non zero real numbers is _____

　　i)　one-one but not onto

　　ii)　onto but not one - one

　　iii)　bijective

　　iv)　many - one & onto

b) Recurrence relation corresponding to the sequence 1, 3, 5, 7, ---------- is _____

　　i)　$a_n = a_{n-1} + a_{n-2}$　$a_0 = 1$ & $a_1 = 4$

　　ii)　$a_n = a_{n-1} + 2$　$a_0 = 1$

　　iii)　$a_n = 2a_{n-1}$　$a_0 = 1$

　　iv)　$a_n = 3a_{n-1}$　$a_0 = 1$

P.T.O.

c) Number of integers divisible by 3 between 1 to 1000 are ___

    i)   333   ii)   334

    iii)   332   iv)   331

d) _____ looping is a statement

    i)   while   ii)   for

    iii) both (i) & (ii)   iv)   none of these

e) The rule $p \to q,\ p \vdash q$ is known as _____

    i)   Conditional Equivalence

    ii)   Detachment rule

    iii) Chain rule

    iv) Disjunctive Simplification

f) Let p be a statement then '$p \vee (\sim p)$' is _____

    i)   always tautology

    ii)   always contradiction

    iii) contingency

    iv) not a statement

g) Characteristic equation for recurrence relation $a_r - 3a_{r-1} + 2$

_____

    i) $\alpha^2 - 2\alpha - 3 = 0$

    ii) $\alpha^2 - 3\alpha - 2 = 0$

    iii) $\alpha^2 - 3\alpha + 2 = 0$

    iv) $\alpha^2 + 3\alpha + 2 = 0$

Q3) Attempt any four of the following: [20]

a) Test the validity of the argument:

If I work then I cannot study, either I work or I passed discrete mathematics, I passed discrete mathematics therefore I studied.

b) Given 6 different physics, 5 different chemistry and 8 different mathematics books.

i) How many ways are there to select one book

ii) How many ways are there to select three books, one of each subject

c) Solve the recurrence relation $a_r + 5a_{r-1} + 6a_{r-2} = 42(4^r)$

d) If n is an integer, then prove that 'if n^2 is odd then n is odd' using method of contrapositive.

e) Write an algorithm to search a number from an array using Linear search.

f) Prove that $\sqrt{2}$ is an irrational number by method of contradiction.

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B.C.S. (Part-I) (Semester-I) (New) Examination, March-2016 ELECTRONICS (Paper-I)
Electronics Devices and Circuits-I
Sub. Code : 59698

Day and Date : Wednesday, 30-03-2016   **Total Marks : 50**
Time : 12.00 noon to 2.00 p.m.

Instructions :   1)   All questions are compulsory.
                 2)   Figures to right indicate full marks.
                 3)   Neat diagrams must be drawn wherever necessary.
                 4)   Use of calculator is allowed.

Q1) Select correct alternatives for the following (one mark each):   **[10]**

a)   A resistor has color code of Red Red Red Gold then its resistance value
     is _____.

   i) $22 \, K\Omega \pm 5\%$ ii) $33 \, K\Omega \pm 5\%$

   iii) $2.2 \, K\Omega \pm 5\%$ iv) $3.3 \, K\Omega \pm 5\%$

b)   Ideal current source has _____ internal resistance.

   i)   Low   ii)   High

   iii)   Infinite   iv)   Zero

c)   The Capacitor has numeric code 103 then its capacitance value is
     _____.

   i) $0.1 \, \mu F$ ii) $0.01 \, \mu F$

   iii) $0.001 \, \mu F$ iv) $1 \, \mu F$

d)   The resistance of a wire is given by R = _____.

   i) $\rho \dfrac{L}{A}$ ii) $\dfrac{L}{\rho A}$

   iii) $\rho \dfrac{A}{L}$ iv)   None of these

P.T.O.

e) According to maximum power transfer theorem, Maximum power transferred from source to load when _____.

    i)   Rs = RL   ii)   Rs > RL

    iii)   Rs < RL   iv)   None of these

f) In Thevenin's theorem, Vth is _____.

    i)   Open circuit voltage

    ii)   Open circuit current

    iii)   Open circuit resistance

    iv)   Short circuit current

g) _____ is a electronically operated switch.

    i)   Rotary switch   ii)   Toggle switch

    iii)   Relay   iv)   Micro switch

h) If 6V battery source applied across series combination of two resistors 2KΩ and 4KΩ then voltage drop across 4KΩ is _____.

    i)   6 V   ii)   4 V

    iii)   2 V   iv)   None of these

i) In P-N junction diode as reverse bias increases the width of depletion layer _____.

    i)   Decreases   ii)   Increases

    iii)   Remains constant   iv)   None of these

j) For the construction of photo diode _____ material is used.

    i)   Lead sulfide   ii)   Indium gallium arsenide

    iii)   Both (i) & (ii)   iv)   None of these

2) Attempt Any Two (10 marks each):

a) Explain with circuit diagram input and output characteristics of CE configuration.

b) Write a note on the classification of resistors. Explain construction of carbon composition resistor in detail.

c) State Norton's theorem. By using Norton's theorem obtain Norton equivalent circuit.
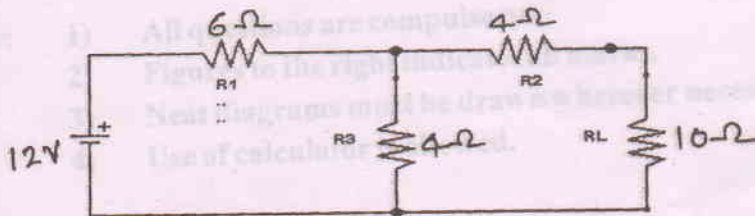
3) Attempt Any Four (5 marks each):   [20]

a) Write a note on construction of PN junction diode.

b) Write a note on 7-Segment display.

c) What are different types of switch? Explain in brief.

d) State and explain Kirchhoff's laws with example.

e) Write a note on electrolytic capacitor.

f) Explain transistor as a switch.

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B.C.S. (Part -I) (Semester -II)Examination, April - 2016
MATHEMATICS
Graph Theory(Paper - III)
Sub. Code: 59704

Day and Date : Wednesday, 06 - 04 - 2016
Time :12.00 noon to 2.00 p.m.

Total Marks :50

Instructions :
1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Use of calculator is allowed.

Q1) Select correct alternative for each of the following:　　　　　　　　　　 **[10]**

a) A graph in which there are no parallel edges as well as no loops is called
---------.

　　i) Simple graph 　　　　　　　　ii) Multigraph

　　iii) Pseudo graph 　　　　　　　　iv) None of these

b) Number of edges in $K_{m,n}$ is---------- .

　　i) m + n 　　　　　　　　　　ii) m - n

　　iii) mn 　　　　　　　　　　iv) m + n -1

c) Maximum height of a binary tree with 25 vertices is --------------.

　　i) 12 　　　　　　　　　　　　ii) 45

　　iii) 22 　　　　　　　　　　　　iv) 10

d) Number of edges incoming towards a vertex in directed graph is called
-------------- .

　　i) In-degree of a vertex 　　　　　ii) out- degree of a vertex

　　iii) length of a vertex 　　　　　　iv) None of these

P.T.O.

e) Total degree of K_4 is--------------.

i) 6   ii) 12

iii) 9   iv) 0

f) The edge connectivity of a connected graph with 5 vertices & 8 edges is------------.

i) 1   ii) 2

iii) 3   iv) None of these

g) A vertex of degree one in a binary tree is called ———.

i) forest   ii) leaf

iii) root   iv) adjacent vertex

h) The expression $a^b + c$ can be written in Polish notation as --------.

i) $+ \uparrow abc$ ii) $a + \uparrow bc$

iii) $\uparrow + abc$ iv) $\uparrow a + bc$

i) A vertex whose removal from a graph G results in a disconnected graph is called -------- .

i) Isolated vertex   ii) Pendant vertex

iii) Cut vertex   iv) None of these

j) In-degree of a source in a transportation network is exactly --------.

i) 1   ii) 2

iii) 5   iv) 0

-2-

Q2) Attempt any two of the following: **[20]**

   a)   Define degree of vertex. Prove the number of odd degree vertices in any graph is always even.

   b)   Prove that a graph with n vertices is a tree if and only if it is circuit free and has n-1 edges.

   c)   Using Ford-Fulkerson algorithm determine the maximal flow in graph G given below.
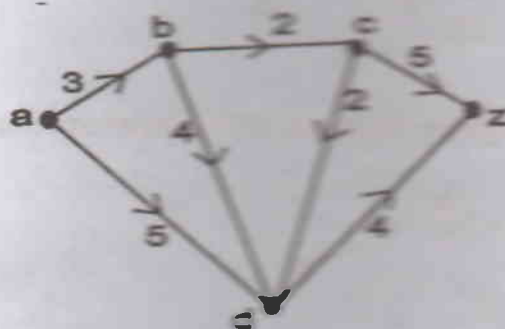
Q3) Attempt any four of the following: **[20]**

   a)   Using Kruskal algorithm find shortest spanning tree for a weighted graph G given below
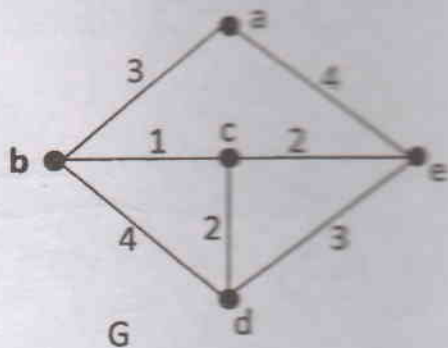
   b)   For a tree T given below find

   i)   Eccentricity of each vertex   ii)   Radius, diameter

-3-
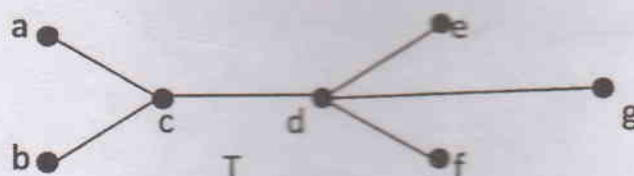
c) Find shortest path from vertex s to vertex a in graph G given below using Dijkstra's algorithm.
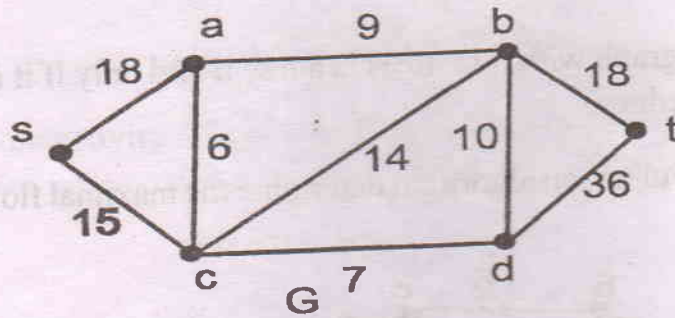
d) Show that graph G given below is self - complementary
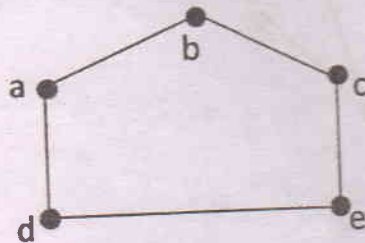
e) Draw the arborescence for expression $(3x-y)(6a+3)$ & write it in polish notation.

f) Define:
   i) Pendant vertex
   ii) Isolated vertex

◆▶ ◆▶ ◆▶

## B.C.S. (Part- I) (Semester -I) Examination, April - 2016
COMPUTER SCIENCE
Introduction to Computer and Data Processing- I (Paper- I)
Sub. Code:59702

Day and Date :Sunday, 03- 04- 2016

Time :12.00 noon to 2.00 p.m.

Total Marks : 50

Instructions : 1) All questions are compulsory.
   2) Figures to the right indicate full marks.

Q1) Select correct alternative and rewrite entire statement. **[10]**

a) Binary circuit elements have _____ stable state.

   i) One

   ii) Two

   iii) Three

   iv) Five

b) From the following _____ memories needs refreshing.

   i) SRAM

   ii) DRAM

   iii) ROM

   iv) All of these

c) _____ is not purely output device.

   i) Screen

   ii) Printer

   iii) Speaker

   iv) Plotter

P.T.O.

d) _____ is not a computer classification.

    i)   Mainframe   ii)   Maxframe

    iii)   Mini   iv)   Micro

e) _____ passes into and out from the computer via its ports.

    i)   Data   ii)   **Bytes**

    iii)   Graphics   iv)   Pictures

f) In an Assembly language the computer instructions written with the use of English words instead of binary machine code is called as _____

    i)   ASCII codes   ii)   Symbolic code

    iii)   Gray codes   iv)   Opcode

g) On _____ aspect the analog computers are better than digital computers.

    i)   Speed   ii)   Accuracy

    iii)   Reliability   iv)   Automatic

h) The Magnetic tape can serve as _____ media.

    i)   Secondary storage   ii)   Output

    iii)   Input   iv)   Processing

i) EBCDIC computer codes can code up to _____ different characters.

    i)   256   ii)   128

    iii)   32   iv)   64

j) The term gigabyte refers to _____.

i) 1024 bytes   ii) 1024 kilobytes

iii) 1024 megabytes   iv) 1024 gigabytes

Q2) Attempt any two of the following.   **[20]**

a) Explain high level and low level languages with their advantages and disadvantages.

b) Write steps to convert decimal number into its equivalent binary number. Give its example.

c) What is an operating system? Explain its functions.

Q3) Attempt any four of the following.   **[20]**

a) Explain booting process.

b) Explain any five DOS internal commands.

c) Draw diagram and explain Magnetic tape as storage device.

d) Explain five generations of computer system.

e) Explain Gray code and Excess 3- code.

f) Explain MICR.

Seat
No.

B.C.S. (Part - I) (Semester - I) Examination, April - 2016
COMPUTER SCIENCE
Introduction to Programming Using 'C' - I (Paper - II)
Sub. Code:59703

Total Marks : 50

Day and Date : Monday 04 - 04 -2016

Time :12.00 noon to 2.00 p.m.

Instructions : 1) All questions are compulsory.

2) Figures to the right indicate full marks.

Q1) Select correct alternative and rewrite entire statement.   **[10]**

a) The statement putchar(h) function always outputs character h to
the_____.

i)   screen

ii) depends on the compiler

iii) depends on the standard

iv) standard output

b) From the following _____ is odd function.

i)   printf

ii) fprintf

iii) putchar

iv) scanf

c) _____ loop is most suitable to first perform the operation and then
test the condition.

i)   For

ii) While

iii) Do- while

iv) None of these

P.T.O.

d) From the following _____ is an invalid if- else statement.

   i) if(if(a==1)){}   ii) if(func1 (a)){}

   iii) if(a){}   iv) if((char) a){}

e) _____ data type will throw an error on modulus operation (%).

   i) Char   ii) Short

   iii) Int   iv) Float

f) From the following _____ is not an arithmetic operation.

   i) a*= 10;   ii) a /= 10;

   iii) a != 10;   iv) a %= 10;

g) What is short int in C programming?

   i) Basic data type of C

   ii) Qualifier

   iii) Short is the qualifier and int is the basic data type

   iv) All of these

h) The format identifier '%i' is also used for _____ data type.

   i) char   ii) int

   iii) float   iv) double

i) _____ is not a valid variable name declaration in 'C' language.

   i) int _a3;   ii) int a _3;

   iii) int 3_ a;   iv) int _3a

6) What are the characteristics of an algorithm?

e) Write a 'C' program to find sum of digits of given number.

d) How to use printf( ) and scanf( ) functions?

c) Write syntax and explain for loop with example.

b) Explain any two unconditional breaking control statements.

a) Explain strcmp( ) and strrev( ) function with example.

3) Attempt any four of the following. (Five marks each) **[20]**

c) What is an array? Explain multidimensional array with example.

b) Write syntax and explain if, if else, nested if statement with example.

a) What is variable? Explain various data types used in 'C'.

2) Attempt any two of the following. **[20]**

iii) stdout.h   iv) stdinput.h

i) stdlib.h   ii) stdio.h

1) The function printf( ) belongs to _____ header file C language.

Seat
No.

B.C.S. (Part - I) (Semester - I)
Examination, April - 2016
STATISTICS (Paper - II)
Probability and Discrete Probability Distributions
Sub. Code : 59701

Day and Date : Saturday, 2 - 04 - 2016   Total Marks : 50
Time : 12.00 noon. to 2.00 p.m.

Instructions :   1)   All questions are compulsory.
                  2)   Figures to right indicate full marks.
                  3)   Use of calculator and statistical table is allowed.

Q1) Choose the correct alternative.   **[10]**

a)   If A and B are two events, then probability of occurrence of either A or B
      is _____.

      i) $P(A) + P(B)$ ii) $P(A \cup B)$

      iii) $P(A \cap B)$ iv) $P(A) . P(B)$

b)   If $A \subset B$, then relation between P(A) and P(B) is _____.

      i) $P(A) \neq P(B)$ ii) $P(A) = P(B)$

      iii) $P(A) > P(B)$ iv) $P(A) < P(B)$

c)   If P(A)=0.3, P(B)=0.4 and A and B are mutually exclusive then $P(A^c / B^c)$ =
      _____.

      i)   0.3   ii)   0.4

      iii)   0.12   iv)   0.5

d) In an experiment of tossing of 3 coins simultaneously, Probabil [j]
getting at most one tail is_____.

i) 1/2   ii) 1/8

iii) 3/8   iv) 7/8

e) If A and B are independent events with P(A)=0.3, P(B)=0.5 and
A)=k, then value of k is_____.

i) 0.5   ii) 0

iii) 0.7   iv) 0.3

f) Let the p.m.f. of X be $P(x)=\dfrac{3-x}{10}$; $x=-1,0,1,2$ and equal to zero other
then mean of X is_____.

i) −1   ii) 0

iii) 1   iv) 0.5

g) For Binomial distribution_____.

i) Mean=Variance   ii) Mean>Variance

iii) Mean<Variance   iv) None of these

h) A card is drawn from a pack of 52 playing cards, the probability it
be king given that it is red is_____.

i) 1/52   ii) 2/26

iii) 1/2   iv) 13/52

i) _____is not an example of random experiment.

i) Rolling of coin   ii) Tossing of coin

iii) Throwing of ball in sky   iv) Detection of blood group

j) $X \rightarrow P(4)$ and $Y \rightarrow P(3)$, both X and Y are independent, then variance of X+Y is_____.

i) 1
ii) 4
iii) 25
iv) 7

[20]

Q2) Attempt any two of following:

a) Define pairwise and mutual (complete) independent. If A and B are independent, then show that

i) A^c and B are independent.

ii) A^c and B^c are independent.

b) State Bay's theorem.

The probabilities of A, B and C becoming managers are 4/9, 2/9 and 1/3 respectively. The probabilities that the Employment insurance scheme will be introduced if A, B, C become managers are 3/10, 1/2 and 4/5 respectively. If the employment scheme has been introduced, what is probability that the manager appointed was A.

c) Following is distribution function of discrete r.v. X

X	1	2	3	4	5	6	7	8
F(X)	0.08	0.12	0.23	0.31	0.48	0.62	0.85	1

Find i) Probability distribution of X.

ii) $P(X \leq 4)$, $P(2 \leq X \leq 6)$.

iii) $P(X=5/X \geq 3)$, $P(X \geq 6 / X \geq 4)$.

Q3) Attempt any four of following:

a) Let $X \to B(8, 1/4)$. Find

    i) $P(X=3)$

    ii) $P(X<3)$

    iii) $P(X \le 6)$.

b) Show that: i) $P(\phi)=0$

                 ii) $P(A')=1-P(A)$.

c) Let X is a discrete r.v. with pmf

$$P(X)=\frac{x}{15}; \quad x=1,2,3,4,5$$

$$=0 \quad \text{otherwise}$$

    Find E (X) and var (X)

d) If $P(A)=0.5$, $P(B)=0.6$, $P(B/A)=0.9$. Find the probability that

    i)   A and B both happens

    ii) Atleast one of A and B happens

    iii) A happens given B has happened.

e) Define expectation. Prove that $Var(X) = E(X^2)-[E(X)]^2$.

f) Define the terms:

    i)   Sample space

    ii) Event

    iii) Compliment of event

    iv) Null event

Seat
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B.C.S. (Part - I) (Semester - II)
Examination, April - 2016
STATISTICS (Paper - IV)
Continuous Probability Distributions and Testing of Hypothesis
Sub. Code : 59711

Day and Date : Tuesday, 12 - 04 - 2016   **Total Marks : 50**
Time : 12.00 noon. to 2.00 p.m.

Instructions :   1)   All questions are compulsory.
                   2)   Figures to the right indicate full marks.
                   3)   Use of calculator and statistical table is allowed.

Q1) Choose the correct alternative.   **[10]**

a)   Probability of rejecting Ho when it is true is equal to_____.

   i)   Level of significance   ii)   Probability of Type 1 error
   iii) Power of test   iv)   Both (i) and (ii)

b)   If X and Y are independent N(10, 9) and N(15, 16) then X+Y
     follows_____.
     i)   N(25, 25)   ii)   N(12.5, 337)
     iii) N(5, 25)   iv)   N(0, 1)

c)   If $Y \rightarrow$ Chi square distribution with 16 d.f. then $P(Y \leq 20.465)$ is

     _____.
     i)   0.7   ii)   0.3
     iii) 0.8   iv)   None of these

d) If X follows exponential distribution then_____.

    i)   Mean=Variance   ii)   Mean=S.D.

    iii) Mean>Variance   iv) Mean=Mode

e) If F(X) is a distribution function and $x_2 > x_1$ then_____.

    i) $F(x_2) < F(x_1)$ ii) $F(x_2) \le F(x_1)$

    iii) $F(X_2) \ge F(x_1)$ iv) $F(X_2) > F(x_1)$

f) If $X \to t_n$ then X^2 has _____ distribution.

    i)   t   ii)   Chi square

    iii) F   iv) None of these

g) For testing goodness of fit_____test is used.

    i)   Normal   ii)   t

    iii) F   iv) Chi square

h) $X \to U(a, b)$ then mean of distribution is_____.

    i) $\dfrac{b-a}{2}$ ii) $\dfrac{b+a}{2}$

    iii) $\dfrac{a-b}{2}$ iv) $\dfrac{ab}{2}$

i) Testing $H_0 : \mu = 0$ against $H_1 : \mu > 0$ is a _____ test.

    i)   Two tailed   ii)   One sided left tailed

    iii) One sided right tailed   iv) None of these

j) If $X \to N(-80, 81)$ then standard normal variate is_____.

    i) $\dfrac{X+80}{9}$ ii) $\dfrac{X-80}{9}$

    iii) $\dfrac{X-80}{81}$ iv) $\dfrac{X+80}{81}$

variance of continuous random variable

c) Define Normal distribution. State its mean, variance
State Binomial and Poisson approximation to normal

Q2) Attempt any two of following: [20]

a) Define hypothesis. Discuss the procedures to test

i) $H_0 : \mu = \mu_0$ against $H_1 : \mu \neq \mu_0$

ii) $H_0: P = P_0$ against $H_1 : P \neq P_0$ For large sample tests.

b) Explain the terms:

i) Continuous random variable

ii) Probability density function

iii) Distribution function

iv) Mean

v) Variance of continuous random variable

c) Define Normal distribution. State its mean, variance, additive property. State Binomial and Poisson approximation to normal.

Q3) Attempt any four of following: [20]

a) State properties of distribution function of continuous r.v.

b) A die was thrown 90 times and number of faces shown are as indicated below:

Faces	1	2	3	4	5	6
Frequencies	18	14	13	15	14	16

Test whether the die is "fair".