BCS-12

Roll No. 2016021095

B.Tech (SEM III)
ODD Semester
Minor Test 2017-2018

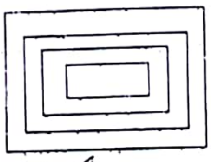
SUBJECT NAME: PRINCIPLES OF DATA STRUCTURES THROUGH C/C++

Time: 2 Hr **Max Marks: 20**

Note: Attempt all questions.

Q1. Attempt any three parts of the following. Q1(a) is compulsory. [4+2+2+2]

(a) Write a recursive function to draw the following pattern of n^{th} level where 'n' is user input.



Example of 4^{th} level pattern

(b) Define the followings:
(i) linear and non-liner data structure with suitable examples.
(ii) Priority queue and D-queue.

(c) Write a function to display the alternative nodes of a linked list.

(d) Write a function to reverse a linked list.

Q2. Attempt any two parts of the following. Q2(a) is compulsory. [4+2+2]

(a) Use appropriate data structure and evaluate the following expressions:
(i) 10 5 + 4 * 12 8 - 3 1 + / - (Postfix)
(ii) + 6 * / * - 9 1 10 ^ 2 3 + 2 5 (Prefix)

(b) Write a program to implement two stacks in a single array.

(c) Write a program that takes a sparse metrics as input and produces transpose and display it.

Q3 . Attempt any two parts of the following. Q3(a) is compulsory. [4+2+2]

(a) Given two linked lists, to represent two stings respectively, where each character of the strings is a node in the linked list. Write a function *compare()* that works similar to the string compare function "*strcmp()*".

(b) Write a function that removes duplicate from an linked list

(c) Write a function to swap the Kth node from the beginning with the kth node from end of a doubly linked list.

B. Tech. (III Semester)
ODD SEMESTER
MAJOR EXAMINATION 2017 - 2018

Subject Name: Principles of Data Structures through C/C++

Time: 3 Hrs. Max. Marks: 50

Note: Attempt all questions. Each question carry equal marks.

1. **Attempt any four parts of the following:** $(4\times 2.5 = 10)$

(a) Write a program to implement Tower of Hanoi problem for n disks.

(b) Write a program to split a circularly linked list into two circularly linked Lists.

(c) Use appropriate data structure to convert infix expression *((A-B)+C*(D+E))-(F+G)* in to prefix expression. Show all intermediate steps.

(d) What are differences between using recursion to solve a problem versus using iteration? Comment whether one should use recursion or iterations.

(e) The Sierpinski triangle is a fractal and attractive fixed set with the overall shape of an equilateral triangle, subdivided recursively into smaller equilateral triangles as shown below up to fourth level. Write a program to draw it up to n^{th} level.

(f) Suppose a queue is maintained by a circular array QUEUE with N = 12 memory cells. Find the number of elements in QUEUE if

i) Front = 4, Rear =8.
ii) Front = 10, Rear = 3.
iii) Front = 5, Rear = 6 and then two elements are deleted.

2. **Attempt any two parts of the following:** $(2\times 5 = 10)$

(a) Create binary search tree by inserting the integer keys 13, 3, 4, 12, 14, 10, 5, 1, 8, 2, 7, 9, 11, 6, 18 in that order, starting from an empty tree. Now delete the key 4 and show the modified tree.

(b) Show the B-tree of order 5 that results after each of the integer keys 1, 12, 8, 2, 25, 6, 14, 28, 17, 7, 52, 16, 48, 68, 3, 26, 29, 53, 55, 45, 67 are inserted in that order, into an initially empty B-tree. Clearly show the tree that result after each insertion

(c) What is a heap? How can a heap be used to represent a priority queue? Describe how to perform the operations of item insertion and removal in heap used to represent priority queues?

3. **Attempt any two parts of the following:** $(2\times 5 = 10)$

(a) Show the AVL tree that results after each of the integer keys 9, 27, 50, 15, 2, 21, 36, 45, 18, 25, 55, 10 and 12 are inserted, in that order, into an initially empty AVL tree. Clearly show the tree that results after each insertion, and make clear any rotations that must be performed

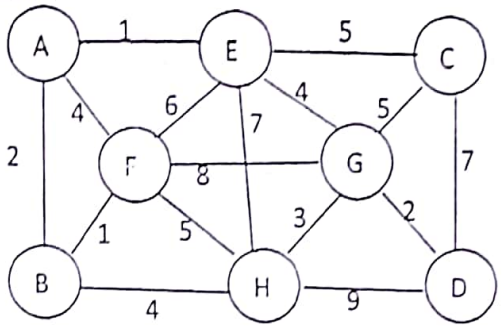
(b) Create a Huffman tree with the following nodes arranged in a priority queue and find the codes assigned to them.

A	F	G	B	I	C	J	D	H	E
7	21	27	9	35	11	40	14	29	18

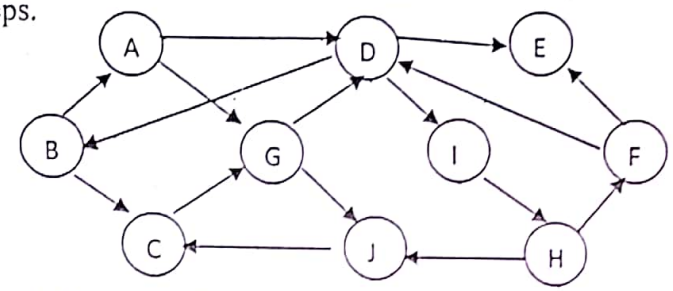
(c) Draw the Binary tree with the help of the given Post-order and In-order traversals of a binary
Post-order: J K I H G B M N L F E D C A; **In-order:** G J I K H B A C E M L N F D

4. **Attempt any two parts of the following:** $(2\times 5 = 10)$

(a) Apply Prims algorithm to find a minimum spanning tree of the following Graph. Display execution of each step of the algorithm



(b) Find all the nodes reachable from **H**. Use the appropriate data structure and show all the intermediate steps.



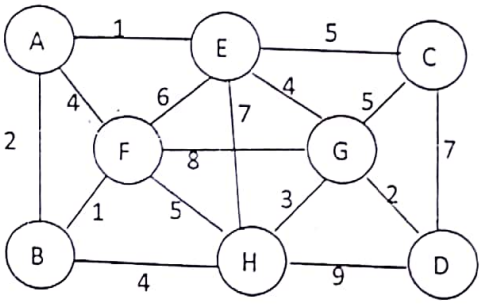
(c) What is collision in Hashing? Explain the various techniques to resolve a collision.

5. **Attempt any two parts of the following:** $(2\times 5 = 10)$

(a) Apply Insertion, and Selection sort algorithm on following data to sort them and compute the number of comparisons required each method.

24, 30, 5, 10, 50, 15, 45, 2, 35, 8, 1

(b) Apply Kruskal's algorithm to find a minimum spanning tree of the following Graph. Display execution of each step of the algorithm.



(c) Write a program to implement quick sort algorithm.

B.TECH /M.B.A/M.Tech

Odd semester

Minor test 2017-2018

Subject- Applied computational method

Time 2 hour

Max mark 20

Note: Answer all questions.

1. Attempt any three parts of the following. Q.1 (a) is compulsory.

(A)Solve by GAUSS –Seidal method the following system: 4

$28x + 4y - z = 32$

$x + 3y + 10z = 24$

$2x + 17y + 4z = 35$

(B) Find Criterion for the convergence in Newton's Raphson method. 2

(c) Prove the following 2

$\Delta = E - 1 = e^{hD} - 1$ and $\delta = E^{\frac{1}{2}}\nabla$

(D) Prove the results 2

$E\Delta = \Delta = \nabla E$; $hD = \log(1+\Delta) = -\log(1-\nabla)$; $(1+\Delta)(1-\nabla) = 1$

2. Attempt any two parts of following Q.2 (a) is compulsory.

(a) Find positive roots of $x - \cos x = 0$ by bisection method. 4

(b) Solve for a positive root of $x^3 - 4x + 1 = 0$ by Regula Falsi Method. 2

(c) Using Newton's method, find the root between 0 and 1 of $x^3 = 6x - 4$ correct to 5 decimal places. 2

3. Attempt any two parts of following Q.3 (a) is compulsory.

(A) Evaluate $I = \int_0^6 \frac{1}{1+x} dx$ using 4

(a) Trapezoidal rule (b) Simpson one third rule (c) Simpsons three eight rule

(B) Use Newtons divided difference formula to find the interpolating polynomial and

Hence evaluate y(9.5) from the given data

X	7	8	9	10
Y	3	1	1	9

(c) The population of a town is as follows.

Year	x :	1941	1951	1961	1971	1981	1991
Populations in lakhs	y :	20	24	29	36	46	51

Estimate the population increase during the period 1946 and 1976.

B. Tech. II
ODD SEMESTER
MAJOR EXAMINATION 2017 - 2018

Applied Computational Method

Time: 3 Hrs. Max. Marks: 50

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

Attempt any four parts of the following: $(4\times 2.5 = 10)$

(a) Determine the real root of $2x - 3\sin x - 5 = 0$ upto six decimal places by Newton's method.

(b) Find the root of the equation $e^x = x^3 + \cos 25x$ upto four decimal places by Regula falsi method.

(c) Solve the system of equations by Crout's method

$2x - 6y + 8z = 24,\ 5x + 4y - 3z = 2,\ 3x + y + 2z = 16.$

(d) Find the interpolating polynomial from the following data:

X	3	2	1	-1
F(X)	3	12	15	-21

(e) Obtain the estimate of the missing values in the following table

X	1	2	3	4	5	6	7	8
F(X)	1	8	---	64	---	216	343	512

(f) Evaluate $\int_0^{1.2} \frac{e^{-x}}{1+x^2}\,dx$ by using Simpson's 3/8 rule with six sub-intervals.

2. **Attempt any two parts of the following:** $(2\times 5 = 10)$

(a) Use Picard's method to approximate y up to fifth approximation when x = 0.2 given that y = 1 when x = 0 and $\frac{dy}{dx} = x - y$.

(b) Using Euler's method, find an approximate value of y corresponding to x = 0.1 given $\frac{dy}{dx} = \frac{y-x}{y+x}$ with initial condition y = 1 at x = 0, h = 0.02.

(c) Given that $\frac{dy}{dx} = 2 + \sqrt{xy}$ and y = 1 when x =1. Find approximate value of y at x = 2 in steps of 0.2, using Euler's modified method.

3. **Attempt any two parts of the following:** $(2\times 5 = 10)$

(a) Evaluate y(1.2), y(1.4) given $\frac{dy}{dx} = \frac{2xy + e^x}{x^2 + xe^x}$, y(1) = 0 by using Runge – Kutta method of forth order.

(b) Solve the difference equation $y_{k+2} + y_{k+1} + y_k = k^2 + k + 1$.

(c) Solve the difference equation $u_{n+2} - 2u_{n+1} + 4u_n = -2^n\{6\cos\frac{n\pi}{3} + 2\sqrt{3}\sin\frac{n\pi}{3}\}$.

(2× 5 =

4. **Attempt any two parts of the following:**

(a) (i) In a binomial distribution consisting of 5 independent trials, probabilities of 1 and 2 successes are 0.5096 and 0.2048 respectively. Find the parameter p of the distribution.

(ii) With the usual notations, find p for a binomial random variable if n = 6 and if 9 P(x = 4) = P(x = 2).

(b) In a distribution exactly normal, 10.03% of the items are under 25 kilogram weight and 89.97% of the items are under 70 kilogram weight. What are the mean and standard deviation of the distribution?

(c) The distribution of the number of road accidents per day in a city is Poisson with mean 4. Find the number of days out of 100 days when there will be:

(i) No accident (ii) at least 2 accidents (iii) at most 3 accidents (iv) between 2 and 5 accidents.

5. **Attempt any two parts of the following:** (2× 5 = 10)

(a) The mean and mode of the following wage distribution are known to be 33.5 Rupees and 34 Rupees respectively. Three frequency values from the table are, however, missing. Find these missing values.

Daily wages (In Rupees)	0-10	10-20	20-30	30-40	40-50	50-60	60-70	Total
Frequencies	10	10	---	----	---	6	4	230

(b) The mean of 5 observations is 4.4 and the variance is 8.24. If three of five observations are 1, 2, and 6, find the other two.

(c) Calculate Karl Pearson's coefficient of skewness from the following data:

Marks	No. Of students	Marks	No. Of students
Above 0	150	Above 50	70
Above 10	140	Above 60	30
Above 20	100	Above 70	14
Above 30	80	Above 80	0
Above 40	80		

BCS-11

20160219S

Roll No. | | | | | | | | | | | |

B.Tech
(SEM III) ODD Semester
Major Examination 2017-2018
Subject Name : Digital Circuits and Logic Design

Time : 3hr

Max Marks:50

Note : Attempt all questions. Each question carry equal marks.

Q1. Attempt any four parts of the following . (4 X 2.5 = 10)

(a) Determine the value of base x if $(211)_x = (152)_8$

(b) Represent the decimal number 295 in binary and in BCD.

(c) Find the complement of F = x + yz and then show that F.F' = 0 and F + F' =1

(d) Simplify the following Boolean function
F(w,x,y,z) = $\sum$ (0,1,2,4,5,6,8,9,12,13,14) using K-maps.

(e) Implement a full adder with two 4 X 1 multiplexers.

(f) Design a BCD-to-decimal decoder using the unused combinations of the BCD code as don't care conditions.

Q2 . Attempt any two parts of the following . (2 X 5 = 10)

(a) Explain the working of J-K flip flop by drawing it's schematic diagram. Write down its Characteristic table and Characteristic equation.

(b) Explain the working of a 4-bit ripple counter with circuit diagram and timing diagram.

(c) How a D Flip-Flop can be converted into a JK flip flop ? Explain in detail.

(2 X 5 = 10)

Q3. Attempt any two parts of the following :

(a) Design a 4-bit binary synchronous counter with D flip-flop.

(b) Design a sequential circuit with two D-flip flops , A and B , and one input ,x. when x =0 , the state of the circuit remains the same. When x =1 , the circuit goes through the state transitions from 00 to 01 to 11 to 10 back to 00 and repeats.

(c) Construct a BCD ripple counter using a 4 bit binary ripple counter that can be cleared asynchronously and an external NAND gate.

Q4 . Attempt any two parts of the following . (2 X 5 = 10)

(a) What is a register ? Explain the concept of a register with parallel load using D flip flops by drawing the circuit diagram.

(b) (i) Differentiate between serial and parallel transfer ? Explain how to convert serial data to parallel and parallel data to serial .

(ii) The content of a 4 bit register is initially 1101. The register is shifted six times to the right with the serial input being 101101. Describe the content of the register after each shift.

(c) Describe a combinational circuit using a ROM. The circuit accepts a 3-bit number and generates an output binary number equal to the square of the input number.

Q5 . Attempt any two parts of the following . (2 X 5 = 10)

(a) Explain about different types of ROM in detail.

(b) A computer uses RAM chips of 1024X1 capacity.

(i) How many chips are needed and how should their address lines be connected to provide a memory capacity of 1024 bytes.

(ii) How many chips are needed to provide a memory capacity of 16K bytes ? Explain in words how the chips are to be connected.

(c) What is meant by fundamental mode of operation ? Discuss about different types of hazards in asynchronous sequential circuits by giving suitable example.

BCS-11.

Roll No. 2016021084

B.Tech
(SEM III) ODD Semester
Minor Test 2017-2018

Subject Name : Digital Circuits and Logic Design

Time : 2 hr

Max Marks:30

Note : Attempt all questions .

Q1. Attempt any three parts of the following . Q. 1(a) is compulsory.

(a) Represent the decimal number 8620 in BCD and excess-3 code.

(b) Explain in brief about the parity bit method of error detection.

(c) What are prime implicants ? Explain.

(d) Simplify the following Boolean function F, together with the don't care condition d and then express the simplified function in sum-of-min terms form.

$F(x,y,z) = \sum (2,3,4,6,7)$
$d(x,y,z) = \sum (0,1,5)$

Q2 . Attempt any three parts of the following . Q. 2(a) is compulsory.

(a) Reduce the following Boolean expressions to the indicated number of literals.

(i) A'C' + ABC + AC' to three literals.
(ii) (A' + C)(A' + C')(A + B + C'D) to four literals

(b) Obtain the truth table of the function F (x,y,z,w) = y'z + wxy' + wxz' + w'x'z and express it in the sum of minterms and product of maxterms form.

(c) Convert the following to the other canonical form.
(i) $F(x,y,z) = \sum (1,3,7)$ (ii) $F(A,B,C,D) = \prod (0,1,2,3,4,6,12)$

(d) Convert the decimal number 225 to binary, octal and hexadecimal.

Q3 . Attempt any three parts of the following . *Q. 3(a) is compulsory.*

(a) Design a BCD to excess-3 code converter.

(b) Explain about decoders in brief ? Construct a *4 × 16 decoder using two 3 × 8* decoders.

(c) Implement $F(A,B,C) = \sum(1,3,5,6)$ *with a 4-to-1 multiplexer.*

(d) Explain about Half adder and Full adder in brief. Design a full adder with the help of two half adders.

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Roll No. | | | | | | | | | | | |

B. Tech. (C.S. /E.E)
ODD SEMESTER
MINOR TEST-2017-2018

Subject Name: Foreign Language German

me: 2 hrs. Max. Marks: 30

ote: Attempt all questions.

rage1 Attempt any three questions of the following. Q. 1 (a) is compulsory Marks

(a) 1. Schreiben Sie das deutsche alphabet mit pronunciation von A zu Z. 4

2. schreiben sie die zahlen von eins zu hundert mit pronunciation.

(b) Aantworten sie für das fragen. 3

1. Woher Kommen Sie?
2. Wie heißen Sie?
3. Was machen Sie hier?
4. Was studieren Sie?
5. Was Lernen Sie?
6. Wie geht es Ihnen?

(c) Ubersetzen sie in English. 3

Hallo,
Guten tag
Ich bin Schmith. Ich bin 20 jahre alt. Das ist mein Familienfoto. Das ist mein vater. Er heißt Rudolf. Und das ist meine Mutter. Sie heißt Sophie.habe ich Geschwister auch, ich habe einen bruder und eine schwester mein bruder heißt Tom er ist 12 und meine Schwester heißt Suzi sie ist 15. Wie heißen deine eltern?
Schreib bald.

(d) 1. Schreibe neue saetze. 3

a. heiße.Martin.ich ----------
b. Du.wer.bist.? ----------
c. bin.Klaus.ich ----------
d. bist.alt.wie.du.? ----------

2.ist oder Sind? (Sine)

a. Das ---------- Peter.
Er---------- Mein Bruder.
b.Das---------- die Eltern von Claudia.
c. Das---------- die Schwester von Klaus.
d. Das---------- Herr und frau Meier.
Sie----------die Eltern von Sabinr.

Attempt any three questions of the following. Q. 2 (a) is compulsory

(A) Schreiben Sie über Herbst Berlin Wal.

(B) 1. Schreibe das personalpronomen im nominativ singular.

2. Konjugieren sie die folgenden verbena im prasens!

Kommen, Gehen,Machen,Lernen, studieren.

3.Schreiben Sie in Wortern !
22,23,24.

3

(C) 1.heiße oder heißen ? bin oder Sind?
Entschuldigung, ____ Sie Muller? Ja ich, ____ Muller. Und Sie? Wie____ sie?. ____ sie herr wanger?. Nein, ich____ herr Lange und Sie? Ich___ frau Schulz. Ich ____ die Mutter von klause.

2. Schreiben sie im English.
Tag,Taglich,Heute,Morgen,Gestern,Nachmittag.

(D) Füllen Sie die Leerzeichen aus, Komme-Kommst-Kommt-Kommen? 3
Woher----------Sie?--------Sie aus England? Herr Schmitt---------- aus Bermen. Er Mach urlaub. Wann------ er zuruck? --------Sie aus Koln? Nein, Ich-------- aus Bonn. Woher-------- Sie, Fraulein Ito? Ich----- aus japan. Herr und Frau Santos---- -- Aus Brasilien. Woher----- ihr? Wir---------- aus Grussbritannien. Anne---------- Aus England und John---------aus Grussbritannien. Marie, Woher----------Du? ---------du aus Paris? Ja ich---------- aus paris. Wir--------- heute nicht.

Frage3 Attempt any three questions of the following. Q. 3 (a) is compulsory

(A) Schreiben Sie über harte Fakten von Deutschland: Education System 4

(B) 1.Dein oder Deine / Er oder sie? 3
a. Heißt_____ Schwester susi? Nein,_____ heißt Ulrike.
b. Heißt_____ Mutter Klara? Ja,____ heißt Klara.
c. Heißt_____ Freund Paul? Ja___ heißt Paul.

2. schreiben sie ein email zu ihr Bruder.

(C) 1.Was Passt Zusammen? 3

-Ich	Wiedersehen.
-Und Wie	Stefan.
-Hallo, Ich bin	Bist du.
-und wer	Tina.
-Wie alt	heisse Thomas.
- Ich bin	bist du?
- Gruss dich	Heisst du?
- Auf	12.

(D) . schreiben sie den bestimmten Artikel von folgenden Nomen 3

Mann,Bruder,Buch, Vater, Mutter, Kinder

MAS110

MAS110

Roll No.										

B. Tech. II
ODD SEMESTER
Major Examination-2017-2018
Subject Name: German language

Time: 3 hrs. Max. Marks: 50

Note: Attempt all questions. Each question carries equal marks.

rage1 Attempt any four parts of the following. (4×2.5=10)

(a) Erganze: Mochten,mochtest, mochten?
Herr wagner, was_____ sie trinken? Ich_____ ein tasse kaffee.
Und du pia?was____ du? Ich_____ ein glas mineralwasser.
Und du, Claudia?___ du auch etwas trinken? Nein, danke

(b) Ergänze: bin,bist,ist,sind,Seid und eine/einen?
Wir----- drei zu hause. Wer-----du?- ich------- Martin. Herr und Frau weigel-------
----- die Eltern von tina und Stefan. Das---- meine schwester und das------ mein Bruder. Wie veile---- ihr zu hause. Ich habe---- bruder. Sisi hat nur---- onkel. Frau Goetz hat------ Tochter. Haben Sie Geschwister?- Ja,-------- Schwester und----- Bruder.

(c) Ubersetzen sie in English.
Grüß dich! Das ist meine Familie.Wir sind eine ganz normale Familie. Ich wohne zusammen mit meinen Eltern, ich heiße Karl, das ist mein Vater. Er heißt Schmitt und das ist meine Mutter. sie heißt Katrina.meiner kleinen Schwester heißt Lusi und unserer Katze Mick. Meine Großeltern wohnen im München. meine Oma Meier arbeitet noch Sie ist Krankenschwester.Oma Meier nimmt sich viel Zeit für mich und geht häufig mit mir Kleider oder Schuhe kaufen. Mein Vater arbeitet bei Deutsche Bank und fährt am Wochenende gern mit seinem Motorrad. Das findet meine Mutter nicht so gut, weil dass Motorradfahren so gefährlich ist aber Mein Vater versteht das nicht.

(d) Bilden Sie Fragen (Wer-Was- Wie)
1.....? das ist Herr Muller.
2.....? Er ist Techniker.
3.....? Das ist Fräulein Angelina.
4.....? Sie ist Sekretärin.
5.....?Sie ist sehr nett.
6.....? Das sind Herr und Frau Muller.
7.....?Frau muller ist lehrerin.
8.....? Fräulein Ilo ist Studentin.
9.....? Sie ist sehr freundlich.
10.....?Ich bin Devesh Pandey, Ihr Lehrer.

(E) Antworten sie im negative.

(1)Ist der Tisch praktisch?----------

(2) Ist die Lampe modern? ----------

(3) ist das Sofa bequem? ----------

(4) ist die Kueche gross? ----------

(5) ist die Baum Klein? ----------

(F) Schreiben Sie die zahlen von eins zu hundert mit pronunciation.

Frage2 Attempt any two parts of the following: (2×5=10)

(A) schreibe zehn Sätze mit Nicht, Sondern oder Kein / Keine

(B) Ubersetzen sie in Deutsch.

The introduction or background section is a very important part of a scientific paper. It's one of the first sections which most people read, and a good introduction will provide a clear and concise summary of the background to your research. If you don't have English as a first language, then English language science editing can help you to express your ideas in a natural, grammatically correct style of English and follow the rules formal scientific writing. Here's an example of a Standard Scientific Edit on a small part of an introduction section.

(C) Schreiben Sie den bestimmten Artikel für folgenden Namen.
Bett,Schrank,Dusche,Lampe,Baum,Regal,Tisch,Vater,Oma,Tante.

Frage3 Attempt any two parts of the following: (2×5=10)

(A) Schreiben Sie in 300 Worten über Deutschland und die Europäische Union.

(B) Schreibe über Herbst Berlin Wal in 300 Wörter..

(C) der,die das oder ein?

____ Haus von Familie Wegel ist Gross und schoen. Es hat___ wohnzimmer, _____Kueche,____ bad und_____ Schlafzimmer. Frau weigel hat auch____ arbeitzimmer.____ Garten ist sher schoen____ Kuchen ist klein, aber modern.

Auch____ bad ist klein.____ wohnzimmer ist sehr gemutlich.

Frage4 Attempt any two parts of the following: (2×5=10)

(A) Ubersetzen sie in English.

Wir wohnen in munchen, in der hanauerstrasse 19. Dimitri Konstantionou ist unser Nachbar.Herr Konstantinou Kommt aus Griechenland. Er Spricht gut Deutsch. Herr und frau Konstantinou haben drei kinder. Sie heissen Nikos, Elektra und Alkist und Sprechen super Deutsch. Aber frau Konstantinou sprict nur Friechisch und ein bissen Deutch.

(B) Ubersetzen sie in English?

Hallo, mein Name ist simone Becker. Ich wohne mit meinen eltern in eine einfamilienhaus in Heidelberg. Das haus hat drei schlafzimmer, ein wohnzimmer, eine Kuche und einen garten. Der garten ist klein, aber schon mein zimmer ist ziemlich klein, aber durch das fenter kann ich in den garten

sehen. Im zimmer sind mein bett, ain schrank und ein regal fur meine comics und musikinstrumente. Den meine hobbys sind musin und comics lessen.

(C) schreiben sie ein email zu ihr Bruder vor money in 150 worde.

Attempt any two parts of the following: (2×5=10)

(A) Schreibe über die Unification Von Deutschland in 300 Wörter.

(B) Erganze: habe,hast,hat,haben.

Ich____einen hund. Und du?____ du Tiere?

Klara, zu Hause_____ wir viele tiere. Und Monika?____ sie haustiere?

Nein, sie_____ keine tiere.

(C) Schreibe über deine hous im Hundert worde.

B. Tech.
ODD SEMESTER
MAJOR EXAMINATION 2017 - 2018

Subject Name: Internet and Java Programming

ne: 3 Hrs. Max. Marks: 50

Attempt all questions. Each question carry equal marks.

Attempt any four parts of the following: $(4\times 2.5 = 10)$

(a) Write a Java program which opens a connection to a "whois" port on the InterNIC server, sends the command-line argument down the socket, and then prints the data that is returned. InterNIC will try to look up the argument as a registered Internet domain name, then send back the IP address and contact information for that site.

(b) What are wrapper classes? Write a Java program to compute factorial of a given integer number. Make sure that your program takes input from command prompt.

(c) Write a Java program to calculate volume of a box using constructor.

(d) Write a Java program to define a class, describe its constructor, overload the constructors and then instantiate its object.

(e) Write a program to implement the concept of threading by implementing Runnable Interface.

(f) Write a Java program to demonstrate mouse events.

Attempt any two parts of the following: $(2\times 5 = 10)$

(a) Draw JDBC API supports for two-tier and three-tier models for database access. What is JDBC/ODBC Bridge? Explain.

(b) What are the various steps for using JDBC? Write suitable Java codes to demonstrate these steps.

(c) How Java Swing components are different from AWT? How to make Tabbed pane using Swing? Write a Java program for this.

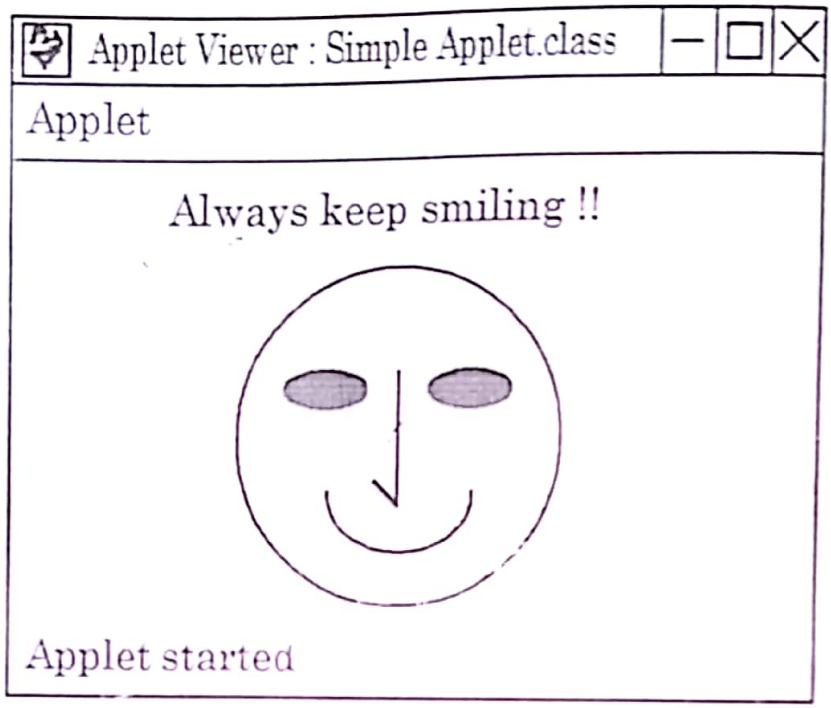
Attempt any two parts of the following: $(2\times 5 = 10)$

(a) Explain the following Swing components with appropriate prototype along with various constructors.

i. JTree
ii. JButton

(b) Explain the life cycle of a servlet. Also show the steps of building and testing a simple servlet.

(c) Write an applet program to display the following output:



4. **Attempt any two parts of the following:** $(2\times 5 = 10)$

(a) Explain Bean Developer Kit (BDK). List and explain various steps to develop a simple Bean program in Java using BDK.

(b) What is javax.servlet.http package? Write four interfaces along with their descriptions. Also list four methods in http servlet request and response methods.

(c) What are various server side technologies for web development. Write advantages/disadvantages of each. Also, write a Servlet program to display Date and Time.

5. **Attempt any two parts of the following:** $(2\times 5 = 10)$

(a) What is bound properties in Java? Imagine you have an online bank account and want to be notified when money is added to your account balance. Write appropriate Bean classes for this in Java to implement this concept.

(b) List salient features of Java Bean. Explain the following in the context of Java Bean:

i. Introspection
ii. Customization
iii. Persistence

(c) Write short notes on the following:

i. Session bean
ii. Entity bean

B. Tech.– II
ODD SEMESTER
MAJOR EXAMINATION 2017 - 2018

Discrete Mathematics

Max. Marks: 50

: 3 Hrs.

ttempt all questions. Each question carries equal marks. $(4\times 2.5 = 10)$

Attempt any four parts of the following:

(a) Prove that the number of function from $A \to A$ is less than the number of relation from $A \to A$ i.e, $n^n < 2^{n^2}$.

(b) Let $f: R \to R$ be a function defined by $f(x) = px + q \; \forall \; x \in R$. If $fof = I_R$, then find the value of p and q.

(c) Show that the Relation R_5 for which $x \equiv y(mod\ 5), x, y \in Z$ is an equivalence relation.

(d) Define order of an element. How many generators are there of a cyclic group of order 10?

(e) If R is a ring with unity such that $(xy)^2 = x^2y^2 \; \forall \; x, y \in R$, then prove that R is commutative.

(f) Define Field of a ring R. Show that a ring R is with zero divisor if and only if the cancelation law holds in it.

Attempt any two parts of the following: $(2\times 5 = 10)$

(a) Define walk, paths, complete graph, bipartite graph and Euler Circuit with examples.

(b) Let G be a connected graph with n vertices where n is even. If G has two components each of which is complete, then prove that G has a minimum number of $\frac{n(n-2)}{4}$ edges.

(c) Define Kuratowski's graph and show that the complete graph of 5 vertices is non-planer.

3. **Attempt any two parts of the following:** $(2\times 5 = 10)$

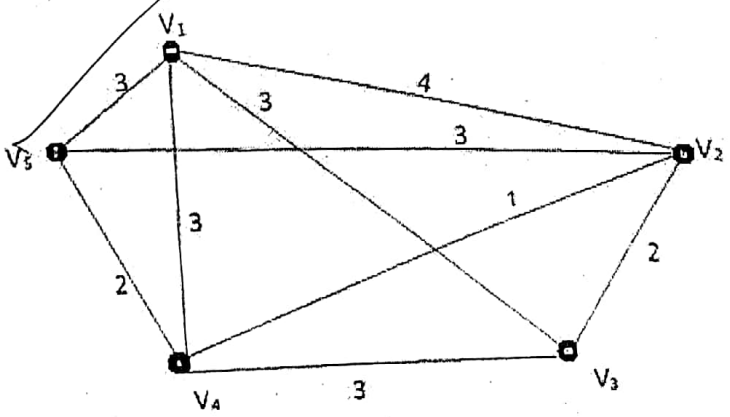
(a) Define graph colouring and show that for a simple regular graph G with n vertices and degree r, $\chi(G) \geq \frac{n}{n-r}$.

(b) Define In order, Pre order and post order of a tree. Construct a binary tree with

Postorder $p\ q\ n\ r\ m\ t\ u\ s\ l$

Inorder $p\ n\ q\ m\ r\ l\ t\ s\ u$

(c) State Kruskal's Algorithm and find the minimal spanning tree of the graph



Attempt any two parts of the following: (2× 5 = 10)

(a) State pigeonhole principle and solve

i) What should be the minimum number of staff in the office so that at least three staff have same joining month?

ii) Out of 15 staff, find the minimum number of staffs that can have their joining in the same months.

(b) Find

i) the three digits number that can be formed from 0,1,2,3,4,5 if digits are repeated.

ii) the number of diagonal that can be drawn in a polygon of n sides.

(c) In collection of 10 electric bulbs 3 are defective. Find

i) number of ways in a sample of 4 bulbs so that 2 are good and 2 are defective.

ii) number of ways in a sample of 4 bulbs so that either 3 are good and 1 defective or 1 good and 3 are defective.

Attempt any two parts of the following: (2× 5 = 10)

(a) Solve $y_{n+2} - y_{n+1} - 2y_n = n^2$ using recurrence relation.

(b) Find generating function of a sequence $\{a_k\}$ if

i) $a_k = 2 + 3k$

ii) $a_k = (x + 1)3^k$.

(c) Use generating function to solve $a_n - 9a_{n-1} + 20a_{n-2} = 0, a_0 = -3 \text{ and } a_1 = -10.$