Roll No. _____ [Total No. of Pages : 2

5E1399

B.Tech. V- Semester (Main) Examination, Nov. -2019
ESC Information Technology
5IT3-01 Microprocessor And Interfaces

Time : 2 Hours **Maximum Marks : 80**

Min. Passing Marks : 28

Instructions to Candidates:

*Attempt **all five** questions from **Part A**, **four** questions out of **six** questions from **Part B** and **two** questions out of **three** from **Part C**. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.*

PART - A

(Answer should be given up to **25** words only)

All questions are **compulsory** **(5×2=10)**

1. Write instruction to mask RST 7.5 and RST 6.5 interrupt simultaneously. **(2)**
2. Differentiate between maskable and non maskable interrupt. **(2)**
3. Differentiate between memory mapped I/O and peripheral mapped I/O. **(2)**
4. What are tri - state devices and explain the use of them in a bus oriented system. **(2)**
5. Write a program to find 2's complement of a number. **(2)**

PART - B

(Analytical/Problem solving questions)

Attempt any **four** questions **(4×10=40)**

1. Draw and explain the interrupt structure of 8085 microprocessor. **(10)**
2. Why are AD_7 - AD_0 lines multiplexed with the help of latching circuit ? Explain how these lines are demultiplexed. **(10)**
3. Explain how subroutines are implemented and executed. Explain call by value and call by reference. **(10)**

4. Draw T states and machine cycle for these instruction set.

   i) LDAX

   ii) STA

   iii) CMP

   iv) MVI **(10)**

5. What is the use of "stack"? Illustrate the PUSH and POP operations with help of suitable example. **(10)**

6. Write an assembly language program in 8085 microprocessor to generate Fibonacci series (count up to 8 steps) **(10)**

PART - C

(Descriptive/Analytical/Problem Solving/Design Question)

Attempt any **two** questions **(2×15=30)**

1. Draw the pin diagram of programmable peripheral interface chip (8255) and explain its various operational modes. **(15)**

2. Explain the Architecture of 8085 microprocessor in detail. **(15)**

3. A [BCD] number between 0 and 99 is stored in an R/W memory location called the "Input Buffer" (INBUF). Write a main program and a conversion subroutine (BCDBIN) to convert the BCD number into its equivalent binary number. Store the result in an memory location defined as the Output Buffer (OUTBUF). **(15)**

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5E1351

Roll No. _____ [Total No. of Pages : 2

5E1351

B.Tech. V- Semester (Main) Examination,November - 2019
ESC Computer Sc. and Engineering
5CS3-01 Information Theory And Coding

Time : 2 Hours **Maximum Marks : 80**
Min. Passing Marks : 28

Instructions to Candidates:

*Attempt **all five** questions from **Part A**, **four** questions out of **six** questions from **Part B** and **two** questions out of **three** from **Part C**. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.*

PART - A

All questions are **compulsory** **(5×2=10)**

1. Define viterbi decoding.
2. What is Galoi's Field.
3. Calculate the amount of information if pK = 1/4.
4. Define code efficiency.
5. Write the principle of static Huffman coding.

PART - B

Attempt any **four** questions **(4×10=40)**

1. Define an entropy and show that $H(s)_{max} = \log_2^9$ hits/messages symbols.
2. Consider a source $S = [S_1, S_2]$ with probabilities 3/4 and 1/4 respectively. Obtain shannon Fono code for sources. Its 2nd and 3rd entermious. Calculate efficiency for each case.
3. Design a single error correcting code with a message block of size 11 and show that by an example that it can correct single error.
4. Consider the polynomial.

$$g(x) = x^6 + 3x^5 + x^4 + x^3 + 2x^2 + 2x + 1$$

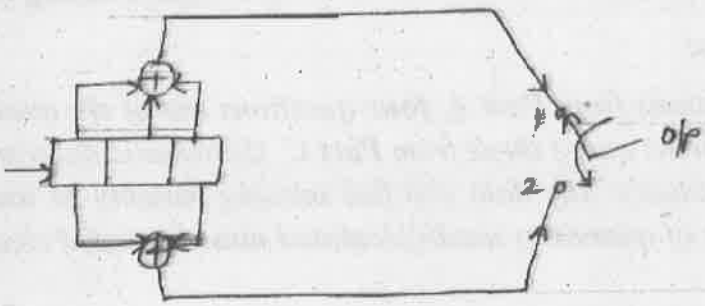
a) Find the parity check matrix H

b) Find code rate of this code

c) Find minimum distance of this code.

5. Design an encoder for (7,4) B_{cc} generator by $g(x)=1+x+x^3$ and verify its operation using message vector 0101.

6. Initially consider that the register contains all zeros. What will be the code sequence if the i/p data sequence is 100110.



PART - C

Attempt any two questions (2×15=30)

1. Let x be number of tosses required to a coin until the first tail appears.

a) Find entropy $H_p(x)$ if coin is fair.

b) Find entropy $H_U(x)$ if coin is unfair.

with P being probability of getting a tail.

2. Determine the Huffman code for the following message with their.

x_1	x_2	x_3	x_4	x_5	x_6	x_7
0.05	0.15	0.2	0.05	0.15	0.3	0.1

and also find the average code word length, entropy, code efficiency, compare the result with entropy.

3. Consider G (7,4) block code generated by

$$G=\begin{bmatrix} 1 & 0 & 0 & 0 & 1 & 1 & 1 \\ 0 & 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$$

Find out the error vector and suppose that the received vector R is 1001001.

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5E1352

Roll No. _____ [Total No. of Pages : 4

5E1352

B.Tech V Semester(Main) Examination,November - 2019
PCC/PEC Computer Science And Engineering.
5CS4-02 Compiler Design
Common For CS,IT

Time : 3 Hours

Maximum Marks : 120
Min. Passing Marks : 42

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, five question out of **Seven** from **Part B** and **Four** questions out of **Five** from **Part C**.*

(Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

PART - A

(Answer should be given up to **25** words only)

All questions are **compulsory** **(10×2=20)**

1. Define input Buffering.
2. What do you understand by Lexical Analyzer?
3. Define Finite automation and regular expression.
4. What do you mean by activation record?
5. Give the full form and definition of DAG.
6. Explain different types of errors in compilers.
7. Briefly describe parameter passing.
8. What do you mean by peephole optimization?
9. Eliminate left recursion in following grammar :-

   $S \rightarrow (L) | a$

   $L \rightarrow L, S | S$

10. Eliminate left factoring in following grammar :

    $S \rightarrow bSSaaS | bSSaSb | bSb | a$

PART - B

(Analytical/Problem solving questions)

Attempt any **five** questions **(5×8=40)**

1. Explain abstract syntax tree. Also create the syntax tree for following :

   i) $(a+b)*(c-d)+((e/f)*(a+b))$ (With post fix notation)

   ii) A + 4 - b + 3 (Also write functions)

2. Explain the phases of compiler and calculate the respective output, after each phase for the input c = a + b*5.

3. Consider the following program segment :

   Begin prod : = 0; i : = 1;

   do begin prod : = prod+ a(i)*b(i);

   i = i + 1; end while (I <=20) end

   Find the basic blocks and construct the flow graph and also optimize the code.

4. Explain type checking, type system, type expression and type conversion.

5. Explain activation record and activation tree. Also calculate the output using activation record for following program :-

```
f1 (int a)
{
int b = 10;
return (a+b);
}
 f2 (int b)
{
 Return (b+f1(b));
}
 main ( )
{
 f2 (4);
}
```

6. What is basic block? Also explain in detail the transformation in basic block.

7. Solve the input id + id*id, using operator precedence parser for the following grammar :

   $T \rightarrow T+T / T*T / id;$

PART - C

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any **Four** questions **(4×15=60)**

1. Consider the following grammar : -

   $S \rightarrow L = RS \rightarrow RL \rightarrow *RL \rightarrow id\,R \rightarrow L$

   Construct the CLR parsing table for this grammar.

2. Given the syntax directed definition below with the synthesized attribute val, draw the annotated parse tree for the expression, specifying moves for the given input string :

   23*5 +4$

$L \rightarrow E$	L.val = E.val
$E \rightarrow T$	E.val = T.val
$E \rightarrow E+T$	E.val = E.val+T.val
$T \rightarrow F$	T.val = F.val
$T \rightarrow T*F$	T.val=T.val*F.val
$F \rightarrow (E)$	F.val = E.val
$F \rightarrow digit$	F.val = digit.lexval

3. Translate the following arithmetic expression

   a+a*(b-c)+(b-c)*d, into : -

   i) Post fix

   ii) Syntax Tree

   iii) 3 Address code

   iv) Quadruples

   v) Triples

   vi) Indirect triples

   vii) DAG

4. Given the grammar

$E \rightarrow E+T$
$E \rightarrow T$
$T \rightarrow T*F$
$T \rightarrow F$
$F \rightarrow (E)$
$F \rightarrow id$

a) Check whether the grammar is LR(O) and SLR(1) or not.

b) Parse the input string "id*id+id" for SLR and generate the parse tree.

5. Consider the following CFG = (N={S,A,B,C,D},T={a,b,c,d},P,S) where the set of production P is given below :

$S \rightarrow A$
$A \rightarrow BC|DBC$
$B \rightarrow Bb|\in$
$C \rightarrow c|\in$
$D \rightarrow a|d$

i) Calculate LL(1) for input string "dbb"

ii) Generate the parse tree for the same.

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5E1353

Roll No. _____ [Total No. of Pages : 2

5E1353

B.Tech. V semester (Main) Examination,November - 2019
PCC/PEC Computer Sc. & Engg.
5CS4-03 Operating System
Common For CS,IT

Time : 3 Hours **Maximum Marks : 120**
Min. Passing Marks : 42

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, **five** questions out of **Seven** from **Part B** and **Four** questions out of **Five** from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Part - A

(Answer should be given up to **25** words only)

All questions are **compulsory** **(10×2=20)**

1. What is semaphore?
2. Briefly explain the two methods of inter process communication.
3. What is starvation? How can we overcome it?
4. Differentiate between kernel and shell?
5. What is TLB? Explain its function.
6. Draw process state diagram.
7. Give the various disk scheduling methods.
8. What are the attributes of files?
9. Why page size is always power of 2?
10. What is a file system? What are various operations performed on a file?

Part - B

(Analytical/Problem solving questions)

Attempt any **five** questions **(5×8=40)**

1. What is paging? Explain with the help of a diagram.

2. Describe multilevel feedback queue scheduling with the help of an example.
3. Explain various strategies to deal with deadlocks? How deadlocks are detected and recovered?
4. Compare the methods by which we can access a file?
5. Explain the need and various services provided by operating system.
6. What do you mean by page - faults? When do page - falts occur? Describe the action taken by the O.S. when page - fault occurs?
7. Discuss the various directory structures.

Part - C

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any **Four** questions **(4×15=60)**

1. Find the number of page faults for the following input string using FIFO and LRU page replacement algorithms :

   1,2,3,2,1,5,2,1,6,2,5,6,3,1,3,6,1,2,4,3. (Consider frame size = 3).

2. Calculate the average waiting time & turnaround time of the system using preemptive SJF and Round Robin ($t_q = 2$) scheduling algorithms :

Process Id	Arrival time	Burst time
P1	0	3
P2	1	5
P3	2	2
P4	3	4
P5	4	1
P6	5	3

3. What are the different mobile operating systems used nowadays? Discuss their features.
4. Find the seek time for the given sequence :

   73, 87, 34, 43, 173, 65, 58, 4, 201 The disk head is at 36 and is moving downward. Total cylinders are 210.

   i) SCAN

   ii) SSTF

   iii) LOOK

5. What are threads? Discuss the advantages and disadvantages of using threads?

Roll No. _____ [Total No. of Pages : 2

5E1354

B.Tech. V- Semester (Main) Examination, Nov. - 2019
PCC/PEC Computer Sc. and Engg.
5CS4-04 Computer Graphics and Multimedia
(Common With CS,IT)

Time : 3 Hours **Maximum Marks : 120**
Min. Passing Marks : 42

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, **five** questions out of **Seven** from **Part B** and **Four** questions out of **Five** from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly. Use of following supporting materials is permitted during examination. (No material is required)

PART - A

(Answer should be given up to **25** words only)

All questions are **compulsory** **(10×2=20)**

1. What is Pixel made of?
2. What is Scan Conversion?
3. Differentiate Plasma panel display and thin film Electroluminous Display.
4. Define Random Scan/Raster Scan display?
5. List out the merit and demerit of punctration technique.
6. Distinguish between convex and concave palygons.
7. What is translations.
8. Distinguish between uniform scaling and differential scaling.
9. List out the various text clipping.
10. Write all steps involved in 3-D Transformations.

PART - B

Attempt any **five** questions **(5×8=40)**

1. Explain scan conversion, write Bresenham's algorithm of line m >1.

2. Use Cohen sutherland line clipping algorithms to find the visible partion of the line P (40,80) Q(120,30) inside the window. The window is defined as ABCD : A(20,20), B(60,20), C(60,40) and D(20,40).

3. Explain in brief RGB, CMY and HSV colour models.

4. What is the use of compression technique in computer graphics? Explain JPEG

5. Show Rotation of a 2D - Box represented by (5,5) to (10,15) with respect to (5,5) by 90° in anti clockwise direction.

6. Explain the document architecture and formating of files or documents in the multimedia systems.

7. Produce a sequence of transformation of refer on image in the line y = mx+c.

PART - C

Attempt any **Four** questions **(4×15=60)**

1. Explain the function of display processor in Raster scan display compare the merit and demerit of raster and vector devices.

2. Explain Beizer curve and Determine eleven points on a Beizer curve with equidistant parametric value having central points

$(x_0, y_0) = (50,180), (x_1, y_1) = (250,100), (x_2, y_2) = (600,300), (x_3, y_3) = (500,50)$.

3. Describe different types of Parallel projection used in computer graphics.

4. Describe Z buffer algorithms for visible surface detection. Also explain backface detection method.

5. What is Animation? What are the challenges faced in its implementation? Write the steps in generation of animation.

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5E1355

Roll No. _____ [Total No. of Pages : 2

5E1355

B.Tech. V- Semester (Main) Examination, Nov. - 2019
PCC/PEC Computer Sc. and Engg.
5CS4-05 Analysis of Algorithms
(Common With CS,IT)

Time : 3 Hours **Maximum Marks : 120**
Min. Passing Marks : 42

Instructions to Candidates:

*Attempt **all ten** questions from **Part A**, **five** questions out of **Seven** from **Part B** and **Four** questions out of **Five** from **Part C**.*

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly. Use of following supporting materials is permitted during examination. (No material is required)

PART - A

Attempt **All** questions of Part A **(10×2=20)**

1. Define complexity with its Notations.
2. Explain what is Greedy Approach to solve the problems.
3. Difference between Greedy Algorithms and Dynamic Programming Approach.
4. What is minimum spanning tree?
5. What is Cut and Min cut?
6. Define cook's theorem.
7. Define Backtracking.
8. What is P, NP and NP hard problems?
9. Define Assignment Problem.
10. Differentiate between Feasible and Optimal solution.

PART - B

Attempt any **five** questions out of **seven** **(5×8=40)**

1. Using Quick sort algorithm sort the following sequence
   A = {13,19,9,5,12,8,7,4,21,2,6,11}.

2. Given 10 files with lengths of {28,32,12,5,84,53,91,35,3 and 11} Find the optimal merge pattern. Also calculate the total number of moves.
3. What do you understand Dynamic programing approach also illustrate its elements.
4. Using strassen's matrix multiplication algorithm compute the matrix product

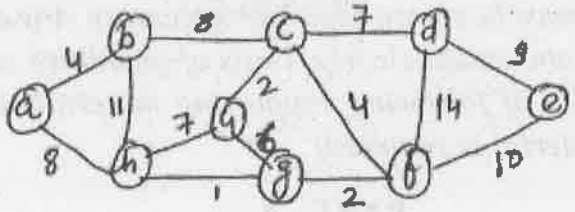
$$A=\begin{bmatrix}1 & 3\\ 7 & 5\end{bmatrix} B=\begin{bmatrix}6 & 8\\ 4 & 2\end{bmatrix}$$

5. Explain the vertex cover and set cover problem.
6. Differentiate between backtracking and branch and bound algorithms.
7. Explain the quadratic assignment problem.

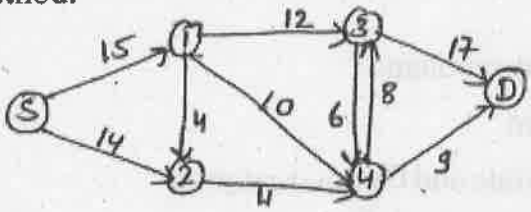
PART - C

Attempt any **Four** questions out of **five** **(4×15=60)**

1. Using Prim's and Kruskal Algorithm. Find out the minimum cost for a given graph.



2. Find an optimal paratherization of a matrix chain product whose sequence of dimensions are.
   <5,10,3,12,5,50,6>
3. Given the two sequence of characters
   $X =< ABCBDAB >$
   $Y =< BDCABA >$
   Find out longest common subsequence.
4. Define flow M/w and solve the following flow M/w for maximum flow using ford Fulkers on method.



5. For a given text
   T = <2,3,5,9,0,2,3,1,4,1; 5,2,6,7,3,9,9,2,1>
   P = <3,1,4,1,5> & q = 13. Find the shift s for which pattern P matches the substring of text 7 using Rabin karp algorithm.

5E1356

Roll No. _____ [Total No. of Pages : 2

5E1356

B.Tech V - Semester (Main) Examination, Nov. - 2019
PCC/PEC Computer Sc. and Engg.
5CS5-11 Wireless Communication

Time : 2 Hours **Maximum Marks : 80**

Min. Passing Marks : 28

Instructions to Candidates:

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used / calculated must be stated clearly.

PART - A

(Answer should be given up to 25 words only)

All questions are compulsory

1. What is fading in wireless channels and its types?
2. Explain frequency reserve concept in brief.
3. Describe principle of offset-QPSK.
4. Explain the concept of macrodiversity.
5. What is beam forming in multiple antenna technique? **[5×2=10]**

PART - B

(Analytical/Problem solving questions)

Attempt any four questions

1. A mobile is moving at 60 m/s in a cellular system with 930 MHz. Find the Dopplar spread, coherence time and appropriate sampling time and distance to predict small-scale fading.
2. Describe the capacity of cellular CDMA system.

3. Consider free space propagation model. Calculate the received power in dBm at a free space distance of 100 meter from the transmitting antenna, if the transmitter produced 50 watt of power and it apply to unity gain antenna with a 900 MHz carrier frequency.

4. Write a short note on digital modulation in frequency selective mobile channel

5. Describe channel state information capacity in fading and non-fading channels.

6. What are cyclic prefix and PAPR. **[4×10=40]**

PART - C

(Descriptive/Analytical/Problem Solving/Design questions)

Attempt any two questions

1. Describe following in details :-
   a) MIMO systems in details.
   b) Spatial multiplexing in detail.
   c) Transmitter and receiver diversity.
2. Explain following in details:-
   a) Adaptive equalization.
   b) Zero forcing and LMS algorithms.
   c) Rake receiver
3. Describe structure of a wireless communication link with the help of suitable diagram. Explain gaussian minimum shift keying and OFDM principle. **[2×15=30]**

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5E1400

Roll No. _____ [Total No. of Pages : 2

5E1400

B.Tech. V- Semester (Main) Examination, Nov. - 2019

PCC/PEC Information Technology

5IT5-12 Software Testing and Project Management

Time : 2 Hours **Maximum Marks : 80**

Min. Passing Marks : 28

Instructions to Candidates:

*Attempt **all five** questions from **Part A**, **four** questions out of **six** questions from **Part B** and **two** questions out of **three** from **Part C**.*

(Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

PART- A

(Answer should be given up to **25** words only)

All questions are **compulsory** **(5×2=10)**

1. What is software testing? Define its importance.
2. What is Regression testing.
3. What is the difference between feasibility study and planning.
4. What is GUI testing.
5. Describe software size estimation.

PART - B

(Analytical/Problem solving questions)

Attempt any **four** questions **(4×10=40)**

1. Describe software project management competencies?
2. Explain Decision table based testing?
3. Describe test care generation using UML diagrams?
4. Explain object oriented testing? Describe scenario based test design.
5. Describe the Integration testing with example.
6. Explain the responsibilities of a software project manager?

PART - C

(Descriptive/Analytical/Problem Solving/Design Questions)

Attempt any **two** questions (2×15=30)

1. Differentiate between white box and black box testing? Also explain various types of black box and white box testing.
2. Explain the issues in object oriented testing? Explain various types of object oriented testing in detail.
3. Write the short note on :
   i) Boundary value testing
   ii) Data flow based testing
   iii) Mutation testing
   iv) Performance testing
   v) Branch coverage.

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5E1357

Roll No. _____ [Total No. of Pages : 2

5E1357

B.Tech. V- Semester (Main) Examination, Nov. - 2019
PCC/PEC Computer Sc. And Engg.
5CS5-12 Human-Computer Interaction

Time : 2 Hours **Maximum Marks : 80**
Min. Passing Marks : 28

Instructions to Candidates:

*Attempt **all five** questions from **Part A**, **four** questions out of **six** questions from **Part B** and **two** questions out of **three** from **Part C**. (Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.*

PART - A

(Answer should be given up to **25** words only)

All questions are **compulsory** **(5×2=10)**

1. What is the Human Computer Interaction?
2. What is sensory memory?
3. State the golden rule of Design.
4. Define Multithreading.
5. Discuss the role of Certifying Authority (CA) in HCI.

PART - B

(Analytical/Problem solving questions)

Attempt any **four** questions **(4×10=40)**

1. How do ergonomics affect the interaction between Man and machine? Explain.
2. What are the characteristics of the GUI? Explain.
3. What is One - way Analysis of ANOVA? Explain with an suitable example.
4. Explain the CMN - GOMS model in terms of HCI.
5. State and Explain Norman's seven principles for transforming Difficult Tasks into simple one's.
6. What is Object oriented programming? Discuss the role of object oriented modelling? in user Interface Design.

PART - C

(Descriptive/Analytical/Problem Solving/Design Question)

Attempt any **two** questions **(2×15=30)**

1. Explain how can you Implement Shneiderman's eight golden rules to design an efficient Interface.
2. What is Concur Task Tress (CTT)? Explain the use of task models in design cycle.
3. Write short note on :
   a) Finite state machine
   b) Agile methodology.

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5E1358

Roll No. _____ [Total No. of Pages : 2

5E1358

B.Tech. V-Semester (Main) Examination, Nov. - 2019
PCC/PEC Computer Sc. and Engg.
5CS5-13 Bioinformatics
Common For CS, IT

Time : 3 Hours **Maximum Marks : 80**
Min. Passing Marks : 28

Instructions to Candidates:

*Attempt **all five** questions from **Part A**, **four** questions out of **six** questions from **Part B** and **two** questions out of **three** from **Part C**.*

(Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly). Units of quantities used/calculated must be stated clearly.

Part - A

(Answer should be given up to **25** words only)

All questions are **compulsory** **(5×2=10)**

1. Define bioinformatics with example?
2. List any 4 database searching tools in bioinformatics?
3. Briefly explain Microarrays?
4. What are phylogenetic trees?
5. Name the experimental techniques for protein structure prediction?

Part - B

(Analytical/Problem solving questions)

Attempt any **four** questions **(4×10=40)**

1. Explain biological pathway building process? What are the stages in pathway analysis?
2. What are the types of phylogenetic trees? Explain.
3. Explain the types of alignments?
4. Define HMMs? Explain Pairwise HMMs?
5. Differentiate probabilistic approaches and grammar - based approaches?
6. Explain substitution matrices?

Part - C

(Descriptive/Analytical/Problem Solving/Design Question)

Attempt any two questions (2×15=30)

1. Explain the types of Networks in bioinformatics?
2. Explain large parsimony and small parsimony problem algorithms with example?
3. Explain protein structure alignment?
