12. Computer Science I Paper (CS.311), 2066

Group "A" (Introduction to computers)

1. **Long Questions :**

   Attempt any TWO Questions.　　　　　　　　　　　　2×10=20

   1.1. What are different Registers available is 8085 CPU ? Explain the function of Program Counter and Stack Pointer registers in 8085 CPU.

   1.2. Draw block diagram of SR Flip Flop with truth table. Explain the merits of D Flip over SR Flip Flop.

2. **Problems :**　　　　　　　　　　　　　　　　　　2×5=10

   2.1. Simplify the following Boolean function using four variables K – map and draw the simplified function using gates.

   $F(A,B,C,D) = \sum(0,1,2,4,5,7,11,15)$

   2.2. Write an assembly language program in 8085 to add two hex number 32H and 24H . Store the result in memory location 2004H.

3. **Short Questions :**

   Attempt any TWO Questions.　　　　　　　　　　　　10×2=30

   3.1. Explain in brief about instruction cycle time, Machine Cycle time and T State.

   3.2. Explain the function of 1/0 processor in I/O sub-system.

   3.3. Draw 2 to 4 Decoder block diagram using gates.

   3.4. Explain the Seek time, Rotational Latency time and Transfer rate of storage devices.

   3.5. What are the different type of Network Technologies ? Explain in brief about Token Ring protocol.

   3.6. What are the main differences between RISC and CISC architecture ?

3.7. What is Dynamic and Static RAM ? Which is faster and why ?

3.8. What is Multiprogramming ? Explain method of doing the Multiprogramming.

3.9. What is 2's complement ? Convert the binary number 10111011 in 2's complement form in step by step.

3.10. What is Network Reference Model and its purpose ?

4. **Long Questions :**

   Attempt any TWO Questions.   1×10=10

   What is an Algorithm ? Why is it important in program development ? Explain different methods to represent an algorithm with suitable example.

   OR

   What is an array ? How does it differ from general variable ? Explain single and multi dimensional array with syntax and suitable example.

5. **Problems:**   2×5=10

   5.1. Write a C program to calculate the factorial value of an integer n using recursion.

   5.2. Write a program in C language that takes string as input and prints the reverse the given string.

6. **Short Questions :**   8×2.5=20

   6.1. What is flow chart ? Write different symbols used to construct flow chart and their meaning.

   6.2. What are bitwise operators used in C ? What are the data types with which bitwise operators can be applied ?

   6.3. What do you mean by recursion ? Write a recursive algorithm to add first n natural numbers.

   6.4. What is a pointer ? Write the basic rules of pointer algebra

   6.5. What is a structure and why is it used ? Write the syntax for declaring a structure that contains a structure

   6.6. What is pre-processor ? Write a nested macro using pre processor directive that evaluates the cube of a number.

   6.7. What are the propertives that C language is referred as one of the structured programming language ?

   6.8. Explain different types of errors in programming.

OLD COURSE

Section "A"

1. **Attempt any THREE Questions.**   3×10=30

   1.1. Define biogeochemical cycle. Explain nitrogen cycle with well labeled diagram. Mention its significance in environment.

   1.2. What is ecological succession ? Discuss different process and regulations of community succession.

   1.3. Describe the chemical and mineralogical composition of soil.

   1.4. What are the meteorological parameters that influence air pollution ?

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Explain.

2. **Describe briefly any TEN Questions :** 10×5=50

   2.1. Importance of biodiversity.

   2.2. Different types of positive interactions among living organisms in natural biotic community.

   2.3. Causes of the forest degradation and its consequences.

   2.4. Statistical methods in chemical analysis.

   2.5. Potentiometric titration.

   2.6. Biological control of pests.

   2.7. Effect of micro-organisms in food

   2.8. Role of micro-organisms in wastewater treatment

   2.9. Internal structure of the earth.

   2.10. Weathering of rocks

   2.11. Causes of earthquakes

   2.12. El Nino and its effects.

Section "C"

3. **Attempt ALL the Questions :** 10×2=20

Differentiate between :

   3.1. Species richness and species evenness

   3.2. Ecotype and ecocline

   3.3. Gross primary productivity and net primary productivity .

   3.4 Volumetric analysis and gravimetric analysis

   3.5. Herbicides and insecticides

   3.6. Actinomycetes and Cyanobacteria

   3.7. Rocks and minerals

   3.8. Rill erosion and gully erosion.

   3.9. Asian monsoon and Indian monsoon.

   3.10. Cyclones and anticyclones.

OLD COURSE

Attempt ALL the questions.

Comprehensive Questions

1. What do you mean by bacterial recombination ? Describe the process of conjugation in bacteria. [4+10]

2. Mention the importance of staining techniques in microbiology . Describe the principle and procedure of gram staining. [4+10]

3. What is the principle of sterilization ? Describe the principle and procedure of control of microorganism by autoclaving. [4+10]

4. Answer any FOUR Questions. [4×4=16]

   (a) Mention the mechanism of mutation by irradiation.

   (b) How pyruvic acid is produced from glucose during bacterial metabolism ?

   (c) Why capsulated bacteria are more virulent ?

(d) Describe in brief the method of coloform weat in waters by MPN method.

(e) Point out Koch's postulates.

$[4 \times 4 = 16]$

5. Justify the statement.

    (a) Plasmid is an extra chromosomal DNA.

    (b) Rhizobium is used as biofertilizer.

    (c) Blood agar is the enriched medium

    (d) Viruses are obligate parasites.

6. Answer any FOUR Questions.

$[4 \times 4 = 16]$

    (a) Point out the difference between bacterial classification and nomenclature.

    (b) List any three protozoan parasites causing human disease and describe their medical importance.

    (c) Draw a labeled diagram of a virus structure.

    (d) Differentiate between exotoxin and endotoxin.

    (e) List any four medically important fungi and the diseae they produced.

7. Answer any FIVE Questions.

$[5 \times 2 = 10]$

    (a) List any two genera of anaerobic bacteria.

    (b) Bacteriophage

    (c) Symbiosis

    (d) Lactic acid bacteria

    (e) Common microbial flora of fresh water environment.

Computer Science I Paper (CS.311), 2067

Bachelor Level /Science & Tech. / I Year   Full Marks: 100

Time: 3 hrs.

Attempt ALL the questions.

Section "A" (Introduction to computers)

1. Long questions:

$[2 \times 10 = 20]$

    1.1 Why computer networking is required? Differentiate between Bus-topology and Star-topology with its merits and demerits.

    1.2 What is microprocessor? Write the block diagram of basic microprocessor and explain the function of each block in brief. Explain the importance of Accumulator in Microprocessor with simple example

2. Problems:

$[2 \times 5 = 10]$

    2.1 Simplify the logic equation using K-map,

$$F = A\bar{B}C\bar{D} + AB\bar{C} + BC\bar{D} + \bar{A}BCD + \bar{A}CD + B\bar{D}$$

    and write the logic diagram simplified logic equation.

    2.2 Write a micro-program for 8085 microprocessor to subtract 40_{10} from 45_{10} and multiply the total by 10_{10}. Store final result in memory location 2050_H

3. Short Questions:

$[10 \times 3 = 30]$

    3.1 Explain the basic structure of static RAM.

    3.2 With the l   of truth table, explain operation of D flip flop made from NAND

3.3. Explain different types of Bus systems.

3.4. Differentiate between hardware control and micro programmed control.

3.5. Differentiate between serial I/O and parallel I/O.

3.6. Explain different types of flags used in the basic microprocessor.

3.7. What do you mean by CPU scheduling?

3.8. Differentiate between multiprocessing and multitasking in computer system.

3.9. Discuss the merit and demerit of compiler over interpreter based translator.

3.10. Explain in brief about multi-media systems. Section "B" (Computer Programming)

4. Long questions: [1x10=10]

Differentiate between iterative technique and recursive procedures. Write an algorithm for complete solution of quadratic equation.

OR

What do you mean by pointer? Explain the use of pointer with suitable program.

5. Problems: [2x5=10]

5.1. Write a program in C to reverse any given string.

5.2. Write a program in C language to multiply two 3 by 3 matrices using function.

6. Short Questions: [8x2.5=20]

6.1. Differentiate between deterministic and non deterministic techniques.

6.2. Explain in brief about search technique?

6.3. Explain in brief about requirement analysis in the program development.

6.4. Why C libraries are required?

6.5. What is a structure and why it is needed?

6.6. What are the C pre-processors? Why they are required?

6.7. Explain in brief about bit-oriented instructions.

6.8. Explain in brief about structure chart.

Computer Science I Paper (CS.311), 2068

Bachelor Level /Science & Tech. // I Year　　　　　　Full Marks: 100
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Attempt ALL the questions.

Section "A" (Introduction to computers)

1. Long questions: [2x10=20]

1.1. What is computer Network? Why is it needed? Differentiate between Ring-topology and Star-topology with its merits and demerits.

1.2. What is microprocessor? What are different types of registers available in 8085?

2. Problems: [2x5=10]

2.1. Simplify the logic equation using K – map.

$F = wx^y Z + wx^y + x^y Z + wx^y z + w\dot{y}z$

and write the logic diagram of simplified logic equation.

2.2. Write a micro-program for 8085 microprocessor to add two numbers 16_H and 20_H Store final result in memory location 2001_H.

3. **Short Questions:** [10x3=30]

3.1. Write the difference between dynamic RAM and static RAM.

3.2. Explain the function of I/O processor in I/O sub-system.

3.3. Draw 3 to 8 Decoder block diagram using gates.

3.4. Differentiate between hardware control and micro programmed control.

3.5. Differentiate between serial I/O and parallel I/O.

3.6. What are the main differences between RISC and CISC architecture?

3.7. Explain different types of flags used in the basic microprocessor.

3.8. What is Multiprogramming? Explain different method of Multiprogramming.

3.9. What is 2's complement? Convert the binary number 100 110 in 2's complement form in step by step.

3.10. What is Network Reference Model and its purpose?

Section "B" (Computer Programming)

4. **Long questions:** [1x10=10]
What is an array? How does it differ from general variable? Explain single and multi dimensional array with syntax and suitable example.

OR

Differentiate between structured programming and non-structured programming. What are the components that makes C language as a structured language?

5. **Problems:** [2x5=10]

5.1. Write a C program to calculate the factorial value of an integer n using recursion.

5.2. Write a program in C language to multiply two 3 by 3 matrices using function.

6. **Short Questions:** [8×2.5=20]

6.1. What is flow chart? Write different symbols used to construct flow chart.

6.2. What are the components of a program?

6.3. What is pointer? Explain with suitable example.

6.4. Why C libraries are required?

6.5. What is a structure and why it is needed?

6.6. Explain the importance of program documentation in program.

6.7. Explain in brief about bit-oriented instructions.

6.8. Differentiate between Structure and Unions in C language.

Computer Science I Paper (CS.311), 2070

Bachelor Level /Science & Tech. /I Year

Full Marks: 100

Time: 3 hrs.

Attempt ALL the questions.

Section "A" (Introduction to computers)

1. **Long questions:** [2×10=20]

    1.1 Why do we need computer Network? Discuss any three network topologies with their merits and demerits.

    1.2 What is flip-flop? Discuss D flip-flop along with block diagram including logic gates and truth table. Explain the demerits of SR flip-flop over D flip-flop.

2. **Problems:** [2x5=10]

    2.1 Simplify the logic equation using K - map.

    $Y = \overline{ABCD} + \overline{ABC} + BC\overline{D} + \overline{ABCD} + \overline{ACD}$

    and write the logic diagram for a simplified logic equation.

    2.2 Write a microprogram for 8085 microprocessor to subtract 80_{10} from 97_{10} and multiply the total by 15_{10}. Store final result in the memory location 1030_H.

3. **Short Questions:** [10×3=30]

    3.1 Explain third generation of computers. What are the benefits of this generation over second generation.

    3.2 Subtract 1011101_2 from 1100001_2.

    3.3 What is RISC computer? Explain its merits over CISC computer.

    3.4 What is software control? Explain.

    3.5 Differentiate between static RAM and dynamic RAM.

    3.6 What is network protocol?

    3.7 Discuss the functions of operating system.

    3.8 Differentiate between compilers and linkers.

    3.9 What is assembly language?

    3.10 What is multiprocessing? Differentiate it with multitasking.

Section "B" (Computer Programming)

4. **Long questions:** [1×10=10]

    What is cooping? Discuss for coop with suitable example. Write an algorithm to check whether a number is even or odd.

    OR

    What is array? Discuss different types of arrays. Differentiate array with structure.

5. **Problems:** [2×5=10]

    5.1 Write a program to find sum and average of 10 numbers.

    5.2 Write a program to add two matrices.

6. **Short Questions:** [8×2.5=20]

    6.1 Discuss the importance of flow-chart.

    6.2 What is structured programming?

6.3 What is if statement?
6.4 What is union?
6.5 Differentiate between top-down and bottom-up design.
6.6 Explain in brief about structure chart.
6.7 Discuss equality and logical operators.
6.8 Discuss about testing of module boundaries.