U.G. 4th Semester Examination - 2022

COMPUTER SCIENCE

[HONOURS]

Generic Elective Course (GE)

Course Code : COM.SC-H-GE-L-202(A&B)

Full Marks : Option-A : 60
Option-B : 40
} Time : $2\frac{1}{2}$ Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

OPTION-A

COM.SC-H-GE-L-202A

(Computer System Architecture)

GROUP-A

1. Answer any **ten** of the following questions: 2×10=20

a) Add two Binary numbers 1111100 and 1111010.

b) What is JK flip flop?

c) What is race condition?

d) What is 1's complement and 2's complement?

e) What do you mean by parallel transfer and serial transfer?

f) What is Branch Unconditionally (BUN) and Branch and Save Return Address (BSA).

g) What are the major components of CPU?

h) Convert the $(15)_2$ to its binary equivalent.

i) What do you mean by start bit, character bit and stop bit in serial asynchronous transfer?

j) What is parity bit?

k) Define instruction format.

l) Why NAND gate called universal logic gate?

GROUP-B

Answer any **four** of the following questions: 5×4=20

2. What do you mean by content addressable memory (CAM)? What do you mean by main memory, cache memory, and auxiliary memory? 2+3=5

3. Write down the truth table, logical expression, block diagram and circuit of full adder. 5

4. Explain the concept of memory interleaving with proper diagram. 5

5. What is parallel transfer and serial transfer? Which one is faster? What do you mean by serial synchronous and serial asynchronous transfer? 2+1+2=5

6. Explain De-Morgan's Theorems and prove these Theorems using Truth table. 2+3=5

7. Differentiate in detail between RISC and CISC architecture. 5

GROUP-C

Answer any **two** of the following questions: 10×2=20

8. What do you mean by addressing modes? Explain in detail about the different addressing modes and give an example in each case. 2+8=10

9. What is write through method and write back method? Explain with block diagram of RAM chip and ROM chip. 3+7=10

10. What is locality of reference? What is biased exponent? Discuss the memory read and memory write operations. 2+3+5=10

11. Write short notes on any **two** of the following: 5×2=10

    a) RISC

    b) Cache memory

    c) Multiplexer

OPTION-B

COM.SC-H-GE-L-202B

[Data Base Management System (DBMS)]

GROUP–A

1. Answer any **five** questions: 2×5=10

    a) What is the function of a database administrator?

    b) What is relational model?

    c) What do you mean by relational integrity constraint?

    d) What is data independence of DBMS?

    e) What do you mean by primary key?

    f) What are the different types of languages that are available in the DBMS?

    g) What is the difference between logical and physical data independence?

GROUP–B

2. Answer any **two** questions: 5×2=10

    a) Write down the differences between strong entity set and week entity set. Briefly explain different types of cardinal relationship. 2+3=5

b) What is entity? What is the purpose of normalization in DBMS? 2+3=5

c) Differentiate between data and information. Explain the architecture of a typical DBMS with neat diagram. 1+4=5

d) Justify the statement "BCNF is stronger than 3NF" with the help of a suitable example. 5

GROUP–C

3. Answer any **two** questions: 10×2=20

a) Explain the various operations in relational model with suitable examples. 10

b) Differentiate between database management system and file-based system. If R={ A,B,C,D,E } and F={ A → C, AC → D, E → AD, E → H}. List all the candidate keys. 5+5=10

c) Write SQL syntax for the following with example: $2\frac{1}{2}\times4=10$

i) SELECT

ii) ALTER

iii) UPDATE

iv) DELETE

d) Write short notes on any **two** of the following: 5×2=10

i) Normal forms

ii) ER model

iii) Relational algebra

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