Total No. of Questions – [03] Total No. of Printed Pages: 02

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OCTOBER 2019/ INSEM (T1)

S. Y. B.TECH. (COMPUTER ENGINEERING) (SEMESTER – III)

COURSE NAME: PROGRAMMING FOR PROBLEM SOLVING

COURSE CODE: CSUA21183

MARKING SCHEME (PATTERN 2018)

Time: [1 Hour] **[Max. Marks: 20]**

Instructions to candidates:

1) **All questions are compulsory.**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed.**
4) **Assume suitable data where ever required.**

Q1) Attempt any **one**

a) Explain in brief, the role of 4 Organizational Charts (other than PAC, IPO, Structure) in problem solving. Draw PAC, Interactivity and IPO Charts for the following problem. [08]

Joe Traders has a set policy for accepting a company as their client. To become their client, a company should satisfy at least 1 of the criteria mentioned below. Set up a single logical expression for checking eligibility of a company to become client of Joe Traders.

Criteria1 - If companies' yearly turnover is above 30 Crores

Criteria2 - If company has "Gold" rating from Chamber of Commerce

Criteria3 - If yearly turnover is less than 30 Crore, then, its first order is at least for 200 dozen items.

Role of Organizational charts [02]

PAC [02]

Interactivity [02]

IPO[02]

b) Solve the following using appropriate variable names, operator hierarchy and diagrams where applicable. [08]

Explain with diagram how the expression " B – C <= D*3 AND E /F > G " is evaluated.

Diagram [02]

Evaluate the above for B=11, C=5, D=2, E=10, F=5, G=2.

Evaluation [01]

Write an equation for finding what percentage is house rent of monthly allowance of a student.

Equation[01]

Correct the R.H.S. of the equation: 7 MOD 21 = 0

Correct Equation[01]

Write a short note on UML Diagrams.

Use case, Class, Sequence, Statechart and Activity Diagram [03]

Q 2) Attempt any **one**

a) List the common types of modules for solving a problem? Name the logic structures used when designing a module. How are the opposing concepts of cohesion and coupling related to designing modules? [08]

List of Common Modules [01]
Name of logic structures [01]
Cohesion and Coupling [02]

Draw the flowchart, with correct symbols, for a solution to tell the user whether a string is a palindrome. (A palindrome string spells the same in both forward and backward direction, e.g. racecar, level, madam, etc.

Flowchart [04]

b) While arranging logistics for a training workshop, Harry wants to buy "folders" to distribute to participants. Total number of folders required is equal to the number of participants, plus an additional 5 folders. [08]

The rate for 1 folder when bought as a single unit is Rs 40. The rate for 1 folder when bought in bulk (wholesale) is less.

The wholesale rate of 1 folder when bought in multiples of 100 is Rs 35.

The wholesale rate of 1 folder when bought in multiples of 500 is Rs 32.

Draw a PAC for the problem of buying best package, for least amount of money, for the given number of participants. Also write an algorithm, flowchart and pseudo code, using correct symbols.

PAC[02], Algorithm [02], Flowchart[02], Pseudo code [02]

Q3) Attempt any **one**

a) Write a 'C' program snippet to print the pattern below: [04]
N is an even number, accepted from user.

$1\ 2^1\ 2^2\ 2^3\ 2^4 \ldots\ldots 2^{N-2}\ 2^{N-1}\ 2^N$ $2^1\ 2^2\ 2^3\ 2^4 \ldots\ldots 2^{N-2}\ 2^{N-1}$ $2^2\ 2^3\ 2^4 \ldots\ldots 2^{N-2}$ …… $2^{N/2}$	E.g. If N=6, pattern is: 1 2 4 8 16 32 64 2 4 8 16 32 4 8 16 8
'C' program snippet [04]	

b) **Fill in the Blanks : [03] each, OOP Concept [01]** [04]