RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College affiliated to University of Calcutta)

B.A./B.Sc. FIFTH SEMESTER EXAMINATION, DECEMBER 2017

THIRD YEAR [BATCH 2015-18]

Date : 18/12/2017 **COMPUTER SCIENCE [Honours]**

Time : 11 am – 2 pm **Paper : V [Gr-B]** Full Marks : 60

UNIT-I

Answer *any one* question from Question Nos. 1 & 2 : [1×5]

1. Compare T-states of JMP instruction for successful and unsuccessful jump operation. 5

2. Discuss the various registers in 8086 microprocessor. 5

Answer *any three* questions from Question Nos. 3 to 7 : [3×10]

3. a) Discuss the use of ALE in 8085 for multiplexing address and data bus.
   b) How the architecture of processor has evolved from 8085 to modern day processor? 5+5

4. a) Write an assembly language program in 8085 to find the second maximum out of 10 numbers stored in memory locations.
   b) Write an assembly language program in 8085 to perform multiplication of two 8-bit unsigned numbers. 4+6

5. a) Draw and explain timing diagram of LXI.
   b) What are the functions of CLOCK OUT, X1 and X2 pin in 8085 microprocessor? 6+4

6. a) What is the functional difference between JMP and CALL instruction? Explain.
   b) What for HOLD and HLDA are used?
   c) What is Implied Addressing Mode in 8085? 4+4+2

7. a) What is handshaking mode operation in 8155/8255?
   b) Explain RIM and SIM instructions in brief.
   c) What are the different interrupts in 8085? 3+3+4

UNIT-II

Answer *any one* question from Question Nos. 8 & 9 : [1×5]

8. a) What are the differences between iterative and classical waterfall models? 4
   b) When and why the feasibility study occur in the SDLC? 1

9. a) What problems would a software development organization face if it does not have a documented process model, and therefore follows only an informal one? 3
   b) "The classical waterfall model is an idealistic model" – Justify it. 2

Answer *any two* questions from Question Nos. 10 to 13 : [2×10]

10. a) Give an example of a software development project for which the iterative waterfall model is not suitable. Briefly justify your answer. 3

    b) Assume that a software development company is already experienced in developing payroll software and has developed similar software for several customers (organizations). Assume that the software development company has received a request from a certain customer (organization), which was still using manually processing of its payroll. For developing a payroll software for this organization, which life cycle model should be used? Justify your answer. 3

    c) Draw a labelled schematic diagram to represent the spiral model of software development. Is the number of loops of the spiral fixed? If your answer is affirmative, write down the number of loops that the spiral has. If your answer is negative, explain how and on what basis the number of loops of the spiral can be determined. 4

11. a) What do you mean by balancing a DFD? Illustrate your answer with a suitable example. 3

    b) Design a DFD for railway reservation system upto level 2. 5

    c) What do you mean by white-box testing? 2

12. a) Draw the control flow graph for the following function named find-maximum. From the control flow graph, determine its cyclomatic complexity. 5

```
int find_maximum(int i, int j, int k)
{  int max;
   if (i>j) then
     if (i>k) then
           max = i;
     else max = k;
   else if (j>k) then
           max = j;
     else
           max = k;
   return (max);
}
```

    b) Describe class diagram and interaction diagram with example. 3+2

13. a) What are the different types of code analysis tools? 2

    b) What is the difference between a sequence diagram and a collaboration diagram? In what context would you use each? 3

    c) Draw a use case diagram and sequence diagram for the operations of a Ticket Vending Machine (TVM). A TVM dispenses tickets to the passengers at a railway station. Passengers use the front panel to specify their boarding and destination place, details of passenger (number of adults & children) and date of travel. The TVM displays the fare for the requested ticket. The passenger then deposits cash in the bin provided and presses "accept cash". The machine checks the cash, if it is more, the balance cash is paid out. Then the requested ticket is printed. The system is also used by the operator who might want to know the cash held in the TVM. The report options include the detailed report of transactions, summary report of the number of tickets sold for each destination, opening balance, cash collected, cash dispensed and current balance in the TVM. 5

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