



WEST BENGAL STATE UNIVERSITY

B.Sc. Honours PART-III Examinations, 2018

COMPUTER SCIENCE-HONOURS

PAPER-CMSA-VI

Time Allotted: 4 Hours

Full Marks: 100

The figures in the margin indicate full marks.

Candidates should answer in their own words and adhere to the word limit as practicable.

Answer Question No. 1 and any five from the rest taking at least one from each group

1. Answer any **ten** questions from the following: 2×10 = 20
- (a) What is copy constructor?
 - (b) Give some characteristics of procedure oriented language.
 - (c) What is orthogonal base class?
 - (d) What is meant by Data hiding?
 - (e) Why tuples in a Relation are not ordered?
 - (f) Distinguish between a Strong Entity and Weak Entity.
 - (g) What do you mean by Lossless decomposition of a relation?
 - (h) What is OLTP?
 - (i) What do you mean by database constraint?
 - (j) Differentiate between primary key and candidate key.
 - (k) What is abstract class?
 - (l) What is frame buffer?
 - (m) What do you mean by clipping?
 - (n) What is Inverse transformation?

Group-A

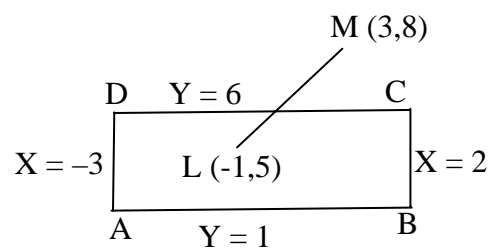
2. (a) What is the utility of Scope Resolution Operator? What are the Advantages and Disadvantages of using Friend Function? 2+2
- (b) When do we need a Copy Constructor in C++? What do you mean by an Abstract Class? When do we need to create an Abstract Class in C++? 2+2+2
- (c) Describe briefly different Access Specifiers of members of a class in C++? When do we need to make a class virtual? 4+2
3. (a) What do you mean by an Operator Overloading in C++? Give the syntax of Binary Operator Overloading in C++. Assignment Operators “=” can not be overloaded using Friend Operator Function. Give reasons. 2+2+2
- (b) What are the different forms of Inheritance available in C++? What is the role of Empty class in Exception Handling in C++? 2+2
- (c) What do you mean by a Virtual Function in C++? Discuss briefly the role of Virtual Pointer (VPTR) and Virtual Table (VTABLE) to implement virtual function mechanism in C++. 2+4

Group-B

4. (a) What are the characteristics of good SRS? 4
 (b) Discuss the disadvantages of water fall model. 4
 (c) Discuss top down and bottom up approach of software design. 4+4
5. (a) What do you mean by SDLC? 4
 (b) Discuss in brief about functional design and detailed design. 4
 (c) What is structure chart? 4
 (d) What do you mean by white box testing? 4

Group-C

6. (a) Clip the line segment LM given below against the clipping window ABCD using Cohen-Sutherland Line clipping algorithm. 6



- (b) A triangle with vertices A(1, 0), B(0, 1) and C(1, 1) rotates about the origin by an angle 45° . Find coordinates of vertices of the rotated triangle. 4
 (c) Compare parallel projection and perspective projection. 4
 (d) Write down a 2D transformation matrix for reflecting a point with $x = y$ axis. 2
7. (a) Explain Bresenham's circle algorithm. 8
 (b) Perform a 45° anticlockwise rotation a triangle A(2, 1), B(3, 8), C(5, 6) about the origin. 4
 (c) Discuss animation and give its utility. 2
 (d) What do you mean by exterior clipping? 2

Group-D

8. (a) What is DBMS? 2
 (b) Discuss the advantages and disadvantages of using DBMS approach as compared to using a conventional file system. 5
 (c) Define the concept of Aggregation, Cardinality Ratio and Relationship. 3+3+3
9. (a) Define 3NF. Why BCNF is called restricted 3NF? Explain with example. 2+2+2
 (b) How lossless join decomposition can be tested? 3
 (c) Explain how division operation works? 2
 (d) What do you mean by Primary, Secondary and Cluster indexing? 3
 (e) What are the different interpretation of NULL values? 2



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Answer Question No. 1 and any five from the rest taking at least one from each group

1. Answer any *ten* questions from the following: 2×10 = 20
- (a) What is the function of W and Z registers in 8085 microprocessor?
 - (b) What is the difference between JMP and CALL instruction in 8085?
 - (c) What is a proxy server?
 - (d) What is the advantage of using associative memory?
 - (e) What is Implied addressing mode? Give example.
 - (f) How does the size of cache block affect the hit ratio?
 - (g) What is programmed IO?
 - (h) What is the difference between hardware and software interrupt?
 - (i) What is Composite Signal?
 - (j) What is Baud Rate?
 - (k) What do you mean by connectionless protocol? Give example.
 - (l) Write down two responsibilities of network layer.
 - (m) What do we need protocols and standards in computer networking?
 - (n) What is meant by Loopback address?
 - (o) What are cookies?
 - (p) Write down two protocol used for Email Services.

Group-A

2. (a) Write an assembly language program in 8085 for multiplication of two 8-bit unsigned numbers. 8+8
- (b) Write an assembly language program to calculate the LCM of two numbers.
3. (a) Draw the timing diagram of LXI instruction and also discuss. 6
- (b) What is the function of ALE in 8085 microprocessor? 3

- (c) Briefly discuss on the T-states of JMP instruction for successful and unsuccessful jump operations. 3
- (d) Discuss on the different interrupts of 8085 microprocessor. 4
4. (a) What is BUS idle machine cycle? Explain with an instruction of 8085. 3
- (b) Explain the working of SP and PC during a jump instruction in 8085. 4
- (c) Explain the role of RIM in interrupt processing. 3
- (d) Draw and explain the basic organization of a microprogrammed control unit. 6
5. (a) Compare direct mapping with associative mapping in cache memory. 4
- (b) Explain Daisy Chaining. 4
- (c) Compare memory mapped IO and peripheral mapped IO. 4
- (d) Draw a schematic diagram for interfacing an external IO device to the microprocessor and memory using DMA. 4

Group-B

6. (a) Explain SNR and SNR_{db} . 4+2
If the power of a signal is 10 mW and power of the noise is 1 μ W what are the values of SNR and SNR_{db} ?
- (b) Compare bandwidth in Hertz with bandwidth in Bits per seconds. 3
- (c) Explain why a single frequency sine wave is not useful in data communication? 3
- (d) Explain attenuation and distortion. 4
7. (a) What are the disadvantages of mesh and ring topology? Draw a hybrid topology with a ring backbone and three bus networks. 4+3
- (b) Give the difference between Microwave and Infrared Transmission. 3
- (c) Describe the various steps needed in creating a checksum with example. 6
8. (a) What are the difference between ISO-OSI model and TCP/IP model? 5
- (b) Why transport layer is responsible for process-to-process delivery? 3
- (c) What are the services of session layer in OSI model? 4
- (d) What are the characteristics of Data Communication? 4
9. (a) Briefly describe cyclic redundancy check with example. 5
- (b) What are the limitations of TCP/IP model? 5
- (c) What is ARP and RARP? 3
- (d) What are the services of Host-to-Network layer in TCP/IP? 3

Group-C

- 10.(a) What is the role of DNS resolver? What are the three different sections of domain name space? 2+2
- (b) Define internet, intranet and extranet. 3
- (c) Compare static and dynamic webpage with suitable example. 4
- (d) If a DNS domain name is department.myuniv.edu, how many levels of hierarchy are involved? 2
- (e) How a hypertext document is different than traditional text document? 3
11. Write short notes on any *four* from the following: 4×4
- (a) Dial up Connection.
- (b) POP3 protocol
- (c) URL
- (d) MIME
- (e) IRC
- (f) WAN.

