

2021

## COMPUTER SCIENCE (Honours)

Paper Code : VIII - A & B

[New Syllabus]

### Important Instructions for Multiple Choice Question (MCQ)

- Write Subject Name and Code, Registration number, Session and Roll number in the space provided on the Answer Script.

**Example :** Such as for Paper III-A (MCQ) and III-B (Descriptive).

Subject Code : 

III	A	&	B
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Subject Name : 

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- Candidates are required to attempt all questions (MCQ). Below each question, four alternatives are given [i.e. (A), (B), (C), (D)]. Only one of these alternatives is 'CORRECT' answer. The candidate has to write the Correct Alternative [i.e. (A)/(B)/(C)/(D)] against each Question No. in the Answer Script.

**Example** — If alternative A of 1 is correct, then write :

1. — A

- There is no negative marking for wrong answer.

### মাল্টিপল চয়েস প্রশ্নের (MCQ) জন্য জরুরী নির্দেশাবলী

- উত্তরপত্রে নির্দেশিত স্থানে বিষয়ের (Subject) নাম এবং কোড, রেজিস্ট্রেশন নম্বর, সেশন এবং রোল নম্বর লিখতে হবে।

উদাহরণ — যেমন Paper III-A (MCQ) এবং III-B (Descriptive)।

Subject Code : 

III	A	&	B
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Subject Name :

- পরীক্ষার্থীদের সবগুলি প্রশ্নের (MCQ) উত্তর দিতে হবে। প্রতিটি প্রশ্নে চারটি করে সম্ভাব্য উত্তর, যথাক্রমে (A), (B), (C) এবং (D) করে দেওয়া আছে। পরীক্ষার্থীকে তার উত্তরের স্বপক্ষে (A)/(B)/(C)/(D) সঠিক বিকল্পটিকে প্রশ্ন নম্বর উল্লেখসহ উত্তরপত্রে লিখতে হবে।

উদাহরণ — যদি 1 নম্বর প্রশ্নের সঠিক উত্তর A হয় তবে লিখতে হবে :

1. – A

- ভুল উত্তরের জন্য কোন নেগেটিভ মার্কিং নেই।

**Paper Code : VIII - A**

Full Marks : 20

Time : Thirty Minutes

Choose the correct answer.

Each question carries 1 mark.

1. DML is provided for —
  - (A) Description of logical structure of database
  - (B) Addition of new structures in the database system
  - (C) Manipulation & processing of database
  - (D) Definition of physical structure of database system
  
2. Architecture of the database can be viewed as —
  - (A) two levels
  - (B) four levels
  - (C) three levels
  - (D) one level
  
3. Key to represent relationship between tables is called —
  - (A) Primary Key
  - (B) Secondary Key
  - (C) Foreign Key
  - (D) None of these

4. Which are the two ways in which entities can participate in a relationship?
  - (A) Passive and active
  - (B) Total and partial
  - (C) Simple and Complex
  - (D) All of the above
  
5. Which of the following is a fundamental operation in relational algebra?
  - (A) Set intersection
  - (B) Natural join
  - (C) Union
  - (D) None of the mentioned
  
6. A functional dependency is a relationship between or among —
  - (A) tables
  - (B) rows
  - (C) relations
  - (D) attribute
  
7. Which forms are based on the concept of functional dependency —
  - (A) 1NF & 2NF
  - (B) 2NF & 3NF
  - (C) 3NF only
  - (D) None of the above

8. In Bresenham's circle generation algorithm, if  $(x, y)$  is the current pixel position then the  $y$  value of the next pixel position is —
- (A)  $y$  or  $y + 1$
  - (B)  $y$  only
  - (C)  $y + 1$  or  $y - 1$
  - (D)  $y$  or  $y - 1$
9. If the scaling factors values  $s_x$  and  $s_y < 1$  then —
- (A) It reduces the size of object
  - (B) It increases the size of object
  - (C) It stunts the shape of an object
  - (D) None
10. In 2D-translation, a point  $(x, y)$  can move to the new position  $(x^p, y^p)$  by using the equation —
- (A)  $x^p = x + dx$  and  $y^p = y + dx$
  - (B)  $x^p = x + dx$  and  $y^p = y + dy$
  - (C)  $x^p = x + dy$  and  $y^p = y + dx$
  - (D)  $x^p = x - dx$  and  $y^p = y - dy$
11. The Cohen-Sutherland algorithm divides the region into \_\_\_\_\_ number of spaces.
- (A) 7
  - (B) 8
  - (C) 9
  - (D) None of the above

12. Which of the following property does not correspond to a good Software Requirements Specification (SRS)?
- (A) Verifiable
  - (B) Ambiguous
  - (C) Complete
  - (D) Traceable
13. Which of the following life cycle model can be chosen if the development team has less experience on similar projects?
- (A) Spiral
  - (B) Waterfall
  - (C) RAD
  - (D) Iterative Enhancement Model
14. \_\_\_\_\_ and \_\_\_\_\_ are the two issues of Requirement Analysis.
- (A) Performance, Design
  - (B) Stakeholder, Developer
  - (C) Functional, Non-Functional
  - (D) None of the mentioned
15. A data store in a DFD represents —
- (A) a sequential file
  - (B) a disk store
  - (C) a repository of data
  - (D) a random access memory

16. How many instances of an abstract class can be created?
- (A) 1
  - (B) 5
  - (C) 13
  - (D) 0
17. Which of the following statement is correct?
- (A) A constructor is called at the time of declaration of an object.
  - (B) A constructor is called at the time of use of an object.
  - (C) A constructor is called at the time of declaration of a class.
  - (D) A constructor is called at the time of use of a class.
18. Which of the following concepts means adding new components to a program as it runs?
- (A) Data hiding
  - (B) Dynamic typing
  - (C) Dynamic binding
  - (D) Dynamic loading
19. An exception in C++ can be generated using which keywords?
- (A) thrown
  - (B) threw
  - (C) throw
  - (D) throws

20. Which of the following statements is correct?

- (A) Base class pointer cannot point to derived class
  - (B) Derived class pointer cannot point to base class
  - (C) Pointer to derived class cannot be created
  - (D) Pointer to base class cannot be created
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P - III (1+1+1) H / 21 (N)

2021

## COMPUTER SCIENCE (Honours)

Paper Code : VIII - B

[New Syllabus]

Full Marks : 80

Time : Three Hours Thirty Minutes

*The figures in the margin indicate full marks.*

Answer any *five* questions taking at least *one* question from each group.

16×5=80

### Group - A

1. (a) What is the use of operator overloading?  
(b) Write a program to overload post and pre-increment operators.  
(c) Explain the inheritance property of object oriented programming with example.  
(d) Why friend function is required to overload binary operators? 2+6+6+2
2. (a) Discuss with examples, the implications of deriving a class from an existing class by the 'public' and 'protected' access specifiers.  
(b) What is abstract class? Why it is used?  
(c) What is class template? How are they created? What is the need for class templates? 6+(2+2)+(2+2+2)
3. (a) What is copy constructor? Why it is required?  
(b) What is virtual base class? Explain with suitable example.  
(c) What is default argument? Explain it with suitable example.  
(d) Write the characteristics of constructor? (2+2)+(2+3)+(2+3)+2

**Group - B**

4. (a) What do you mean by SDLC? Discuss spiral model briefly.  
(b) Discuss various techniques of white box testing.  
(c) Draw the DFD of library management system up-to level 2. (2+4)+4+6
5. Write short notes on the following : 4×4
- (a) SRS  
(b) Structure Chart  
(c) Data Dictionary  
(d) Black box testing

**Group - C**

6. (a) Discuss different 3D transformation techniques briefly.  
(b) Differentiate between parallel Projection and Perspective Projection.  
(c) Write DDA line drawing algorithm. 6+5+5
7. (a) Derive the transformation that rotates an object point  $\theta^\circ$  about the origin.  
(b) Magnify the triangle with vertices A(0,0) , B(1,1), and C(5,2) to twice its size while keeping C(5,2) fixed.  
(c) Discuss Bresenham's circle drawing Algorithm with an example. 4+5+(4+3)
8. Write short notes on the following : 4×4
- (a) RGB color model  
(b) Homogeneous Co-ordinate System  
(c) Inverse Transformation  
(d) Cohen Sutherland line clipping

**Group - D**

9. (a) Consider the employee database, where the primary keys are underlined.

employee(empid, emp\_name, street, city)

works(empid, comp\_id, salary)

company(comp\_id, comp\_name, city)

Give an expression in the SQL Query for each request.

- (i) Find the names of all employees who work for the company SBI.
  - (ii) Find the names, street addresses and cities of residence of all employees who work for SBIC and earn more than 200000 per annum.
  - (iii) Find the names of all employees in this database who live in the same city as the company for which they work.
- (b) What is 2NF? Explain with an example. 3×3+(2+5)
10. (a) Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. State any assumptions you make.
- (b) What is transitive dependency? Explain briefly.
- (c) Explain 3 levels of data abstraction. 6+(2+4)+4
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