SH-II/Comp. Sc./201/C-3/19

B.Sc. 2nd Semester (Honours) Examination, 2019
COMPUTER SCIENCE
(Programming in JAVA)
Paper : 201/C-3
Course ID : 21511

Time: 1 Hour 15 Minutes **Full Marks: 25**

The figures in the margin indicate full marks.

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

1. Answer *any five* questions: 1×5=5

(a) What is unchecked exception?

(b) What do you mean by package in JAVA?

(c) What is polymorphism?

(d) What is throwing and exception?

(e) What is inheritance in JAVA?

(f) What is class?

(g) What is Applet?

(h) What is overloading?

2. Answer *any two* questions: 5×2=10

(a) Explain object oriented concepts in JAVA.

(b) Explain exception handling mechanism in JAVA.

(c) Explain with example about constructor overloading in JAVA.

(d) How an array is created in JAVA? What are the different ways to initialize the array? 2+3=5

3. Answer *any one* question: 10×1=10

(a) What do you mean by JAVA virtual machine? Write a JAVA class circle with constructor methods and methods for finding area and circumference. 2+8=10

(b) List and explain various character stream classes in JAVA. Write a program in JAVA to add first 10 natural numbers. 4+6=10

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SH-II/Comp. Sc./201/C-3/19

B.Sc. 2nd Semester (Honours) Practical Examination, 2019

COMPUTER SCIENCE

(Programming in JAVA)

Paper : 201/C-3

Course ID : 21521

Time: 2 Hours **Full Marks: 15**

The figures in the margin indicate full marks.

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

Experiment = 10 marks and LNB + Viva = 05 marks.

1. Solve *any one* of the following experiments:

(a) W.A.P. to convert a decimal number to a binary number.

(b) Write a program to create a 'distance' class with methods where distance is computed in terms of feet and inches and create an object of a class to see the use of this pointer.

(c) Write a program to demonstrate priorities among multiple threads.

(d) Write a program to demonstrate different mouse handling events like mouseClicked(), mouseEntered(), mouseExited() and mouseDragged().

(e) W.A.P. to find the sum of any number of integers entered as command line arguments.

(f) Write a program to show that during function overloading, if no matching argument is found, then java will apply automatic type conversions (from lower to higher type).

(g) Write a program that shows working of different functions of String and String Buffer-class like setCharAt(), setLength(), append(), insert(), concat() and equals().

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SH-II/Comp. Sc./202/C-4/19

B.Sc. 2nd Semester (Honours) Examination, 2019

COMPUTER SCIENCE

(Discrete Structures)

Paper : 202/C-4

Course ID : 21512

Time: 2 Hours **Full Marks: 40**

The figures in the margin indicate full marks.

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

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

(a) Define partial order relation.

(b) Find the number of ways to paint 12 balls so that 3 of them will be green, 2 of them pink, 2 of them yellow and remaining ones are white.

(c) When an argument is said to be valid and when it is called fallacy?

(d) What is a directed multigraph? Give example.

(e) Define planar graph.

(f) What is recurrence tree?

(g) Define with example the concept of a numeric function.

(h) What is Pigeonhole principle?

2. Answer *any four* questions: 5×4=20

(a) What is the principle of mathematic induction? Show that $1^2 + 2^2 + \cdots + n^2 = \frac{n(n+1)(2n+1)}{6}$ $(n \geq 1)$ by mathematical induction. 1+4=5

(b) Let $A = \{1, 2, 3\}$. How many different binary relations on *A* are there? How many of them are reflexive and how many are symmetric? Define equivalence relation. 1+2+2=5

(c) Write the recurrence relation for the Fibonacci sequence of numbers. Solve the recurrence relation $a_r = 7a_{r-1} - 10a_{r-2}$ given that $a_0 = 0$ and $a_1 = 3$. 1+4=5

(d) When a proposition is called a contradiction? Determine the validity of following arguments:

(i) $p \rightarrow \neg q, r \rightarrow q, r \vdash \neg p$

(ii) $p \rightarrow q, \neg p \vdash \neg q$ 1+2+2=5

(e) Write Prims algorithm for finding MST. Explain with suitable example. 5

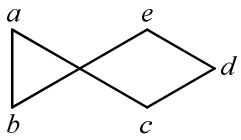
(f) Define the following with example:

(i) Adjacency Matrix of a graph

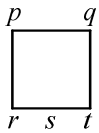
(ii) Rank and nullity of a graph 2+3=5

3. Answer *any one* of the following: 10×1=10

(a) What is edge connectivity? Discuss isomorphism of graph in brief. Using adjacency matrices show that graphs G_1 and G_2 are isomorphic.



G_1



G_2

(b) Among 100 students 32 study mathematics, 20 study physics, 45 study biology, 15 study mathematics and biology, 7 study mathematics and physics, 10 study physics and biology and 30 do not study any of three subjects.

(i) Find the number of students studying all three subjects.

(ii) Find number of students studying exactly one subject.

(iii) Let p denote the statement "The weather is nice" and q denotes the statement "We have a picnic". Translate the following in english:

$p \wedge \overline{q},\ p \leftrightarrow q,\ \overline{q} \rightarrow \overline{p},\ \overline{p} \vee q$ 3+3+4=10

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SH-II/Comp. Sc./203/GE-2/19

B.Sc. 2nd Semester (Honours) Examination, 2019
COMPUTER SCIENCE
(Introduction to Database Systems)
Paper : 203/GE-2
Course ID : 21514

Time: 1 Hour 15 Minutes **Full Marks: 25**

The figures in the margin indicate full marks.

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

1. Answer *any five* questions: 1×5=5

(a) Write down the full forms and meanings of DDL & DML.

(b) What is alternate key? Give one example.

(c) What is partial dependency?

(d) What do you mean by mapping cardinality?

(e) Define tuple and domain in database.

(f) What is data abstraction?

(g) Write two advantages of E-R data model.

(h) What is integrity constraint?

2. Answer *any two* questions: 5×2=10

(a) Write differences between DBMS and FMS.

(b) Write down responsibilities of DBA.

(c) Explain 2NF briefly. Distinguish 3NF & BCNF. 3+2=5

(d) Draw an E-R diagram of Hospital Management System.

3. Answer *any one* question: 10×1=10

(a) What are the different DDL commands in SQL? Consider the following Database scheme:
Employee (Emp_ID, Name, Salary, DOT, Dep_name)
Incentives (Emp_ID, Incentive_date, amount)
Write down the following queries in SQL:
(i) Display no. of departments.
(ii) Get all employee details from the above tables ordered by salary descending.
(iii) Display the names of employees having minimum salary.
(iv) Display details of employee who has no incentives on 01/12/2018. 2+(2×4)=10

(b) Explain overall system structure of a DBMS. 10

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SH-II/Comp. Sc./203/GE-2(PR)/19

B.Sc. 2nd Semester (Honours) Practical Examination, 2019
COMPUTER SCIENCE
(Introduction to Database Systems)
Paper : 203/GE-2
Course ID : 21524

Time: 2 Hours **Full Marks: 15**
Problem = 10
Viva + LNB = 05

The figures in the margin indicate full marks.

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

Answer any one.

1. Create a database using the following tables:

Employee(eid, name, skill, pay-rate)

Position (Posting_no, skill)

Duty_allocation (Posting_no, eid, day, shift)

(a) Identify primary and foreign keys. Insert at least five records.

(b) Get duty allocation for eid 216 for the month of April, 2017.

(c) Get employee names whose rate of pay is more than equal to the rate of pay of 'Rajesh'.

(d) Increase pay-rate of employees by 10% having skill 'Chief'.

2. Create a database using the following tables:

Supplier (sno, sname, status, city)

Parts (pno, pname, colour, weight, city)

Project (Jno, Jname, city)

SPJ (Sno, Pno, Jno, quantity)

(a) Identify primary and foreign keys. Insert at least 5 records.

(b) Get project name supplied by Supplier 'XYZ'.

(c) Change colour of all red parts to orange.

(d) Get supplier names who supply parts to every project.

3. Create a database using the following tables:

Physician (Pid, Pname, P_add, P_mob)

Patient (Ptid, Ptname, Pt_address)

Visit (Pid, Ptid, Date-of-visit, Fees)

(a) Identify primary key and foreign keys. Insert at least 5 records.

(b) Calculate the total fees obtained by the physicians. Also print Pid, Pname of physicians.

(c) Update fees of all physicians by 10% hike.

(d) Find the Pid and Pname of physicians who has not been visited by any of the patients.

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SP-II/Comp. Sc./201/C-1B/19

B.Sc. 2nd Semester (Programme) Examination, 2019

COMPUTER SCIENCE

(Database Management System)

Paper : 201/C-1B

Course ID : 21518

Time: 1 Hour 15 Minutes **Full Marks: 25**

The figures in the margin indicate full marks.

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

1. Answer *any five* questions from the following: 1×5=5

(a) What is Entity and Attributes?

(b) What is Strong entity and Weak entity?

(c) Define Data Dictionary and Metadata.

(d) What is DDL? Give two names of DDL statements.

(e) What is data integrity?

(f) What is Primary key?

(g) What is database schema? How many types of schema?

(h) What is Integrity Constraints? How many types of it?

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

(a) Draw E-R-Diagram for the banking enterprise.

(b) Difference between file processing system and DBMS.

(c) What is Cartesian product? Give an example.

(d) Discuss Three Level Schema Architecture.

3. Answer *any one* question from the following: 10×1=10

(a) What is Normalization? Explain 1NF and 2NF with example.

(b) What is DML and DCL? Write down the function of two DML and DCL statements.

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SP-II/Comp. Sc./201/C-1B(PR)/19

B.Sc. 2nd Semester (Programme) Practical Examination, 2019
COMPUTER SCIENCE
(Database Management System)
Paper : 201/C-1B
Course ID : 21528

Time: 2 Hours **Full Marks: 15**

The figures in the margin indicate full marks.

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

Experiment = 10 marks and Viva + LNB = 05 marks.

1. Perform *any one* experiment:

(i) Create table:

Employee (emp_name, emp_id, company_name, salary, city)

(ii) Insert 5 records in Employee table.

(iii) Add emp_address column in Employee table.

(iv) Show records of employees whose city 'Kolkata' and Salary > 10000.

2. (i) Create table TEACHER [T_name, T_id, Dept, Degree_UG/PG)]:

(ii) Insert 5 records in TEACHER table.

(iii) List the names of all teachers who's degree PG.

(iv) Sort all records in ascending orders (T_id wise).

(v) Show records of all teachers whose name starts with 'A'.

3. (i) Create table student (Name, Roll, Class, Marks):

(ii) Insert 6 records in student table.

(iii) Show name of students who scored marks between 400 and 600.

(iv) Display Name and Roll whose read in class V.

(v) Add a column (Address) in student table.

4. (i) Create tables:

STUDENT (Std_id, std_name, course, Teacher_id)

TEACHER (Teacher_id, Dept, teacher_name)

(ii) Insert 5 records in each table.

(iii) Join the two tables over Teacher_id.

(iv) Delete the records of all students whose course 'BA'.

5. (i) Create table STUDENT (Roll, Name, DOB, Add, Marks)

(ii) Insert 5 records in student table.

(iii) List all students who live in Kolkata and marks > 150.

(iv) Marks wise sort all records.

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