Question Paper Set of

S.Y.B.SC.IT. – Sem-IV

Regular Exam

University of Mumbai

April, 2024

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27/3/24

Note: Simple Calculator is allowed. Assume suitable data wherever necessary.

Q.1 **Attempt any three questions** [15]

(1a) Find Q3 and D7

CI	0 – 2	2 – 4	4 – 6	6 – 8
F	12	18	15	13

(1b) Find AM and Standard Deviation of $17, 8, 13, 15, 22$

(1c) Find Mode i) by formula,   ii) Graphically

CI	0 – 10	10 – 20	20 – 30	30 – 40
F	13	18	20	16

(1d) Find Median

CI	0 – 40	40 - 80	80 – 120	120 – 160
F	5	12	20	24

(1e) Find Quartile Deviation

CI	0 – 10	10 – 20	20 – 30	30 – 40
F	10	18	26	10

(1f) Find AM. Also Write merits and demerits of AM.

X	16	18	25	28
F	16	18	29	40

Q.2 **Attempt any three questions** [15]

(2a) Write a note on Skewness with suitable diagrams.

Find S_k when Mean=4.28, Median=4 and SD=2.54

(2b) Find first raw moment and second raw moment for $2, 3, 3, 6$

(2c) Find third central moment of $5, 4, 7, 9$

(2d) What is the probability of getting a number less than 5 or an odd number when a die is rolled?

(2e) Find the probability that a single toss of a die will result in a number less than 5 if it is given that the toss resulted in an even number.

(2f) In a batch of 140 girls, 37 like blue color, 103 like pink color and 25 like neither. Create a Venn diagram to illustrate the data collected and then determine the probability that if a girl is selected at random, she likes blue color.

Q.3 **Attempt any three questions** [15]

(3a) Explain difference between type I and type II errors.

(3b) The following data refers to the score of 10 students in an exam. Find an estimate of the average score of students.

Score: 52, 50, 55. 57, 67, 76, 55, 59, 56, 60

(3c)   Write steps in testing of Hypothesis.

(3d)   Explain difference between Binomial and Normal distribution.

(3e)   Find 95% confidence limits for sample size of 40, mean as 45 and standard deviation as 6.3

(3f)   The mean lifetime of a sample of 900 bulbs is found to be 1520 hours with a standard deviation of 100 hours. Test the hypothesis that the mean lifetime of bulbs produced by a company is 1600 hours. (Tabular value = 1.64)

Q.4   Attempt any three questions   [15]

(4a)   Clearly explain the conditions to accept or reject null hypothesis in testing of hypothesis. What will be your conclusion if the calculated value of Z test is 1.35 and tabular value is 1.96

(4b)   Write steps to perform Z-test.

(4c)   Perform Chi-Square test to estimate association of Age and Hobby.

	Cricket	Watching TV
Age less than 30	80	30
Age more than 30	50	70

(Tabular value is 3.84)

(4d)   Refer to the data given and write null hypothesis, alternate hypothesis, and assumed level of significance.

Data: Population mean value = 20, Sample mean value = 21, Population SD = 2

(4e)   Discuss application of Statistical tests in business with suitable examples.

(4f)   Explain differences between large sample test and small sample test.

Q.5   Attempt any three questions   [15]

(5a)   Explain difference between Linear and Non-Linear Regression

(5b)   Explain Multiple Regression with a suitable example.

(5c)   Find Karl Pearson's coefficient of correlation.

X	2	4	6	8	10
Y	20	15	14	10	8

(5d)   Fit a straight line, and hence estimate Y for X=5

X	2	4	6	8
Y	5	10	15	12

(5e)   Estimate Y for X=3 using MLS.

X	2	5	8	10	12
Y	5	12	10	15	15

(5f)   Write R code to perform Linear Regression. Assume suitable data.

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PRAHLADRAI DALMIA LIONS COLLEGE OF COMMERCE & ECONOMICS

REGULAR EXTERNAL, MARCH, 2024

Program : Information Technology	SEMESTER: IV
Class: SYBScIT	Course : Computer Graphics & Animation
DURATION: 2:30 HRs	MARKS: 75

Note:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat and labelled diagrams wherever necessary.

Q.1 Attempt any THREE of the following: (15)

a. write a note on Raster Scan Display.
b. List and explain I/O devices used for computer graphics.
c. Write a note on color CRT.
d. Calculate intermediate coordinates using DDA line drawing algorithm with endpoints A(2,3) & B(8,12)
e. Calculate the points between the A = (10, 20) and B=(20, 40) using Bresenham's Line Drawing Algorithm.
f. Explain the role of the clipping window in Clipping technique.

Q.2. Attempt any THREE of the following: (15)

a. Write a note on 3D – Scaling with respect to homogeneous coordinate systems.
b. Explain 2D Shearing with homogeneous transformation matrix.
c. Given a square with coordinate points A (0, 3), B (3, 3), C (3, 0), D (0, 0). Apply the translation with distance 2 units towards X axis and 3 units towards Y axis. Obtain the new coordinates of the square.
d. Rotate a line CD with endpoints (3, 4) and (12, 15) about origin through a 90°.
e. Reduce the size of given triangle to its half, with vertices at original coordinates (10,20), (10,10), (20,10)
f. Write a note on Composite transformation.

Q.3. Attempt any THREE of the following: (15)

a. Explain RGB colour space with a neat and labelled diagram.
b. Explain Window to viewport Transformation.
c. Write a note on photometry.
d. Write a short note on Parallel Projection.
e. Explain 3D Viewing pipeline with its flowchart.
f. Explain following terms
   a. Light
   b. Radiant Flux
   c. Irradiance (with diagram)
   d. Radiant Exitance (with diagram)

Q.4. Attempt any THREE of the following: (15)
  a. List and explain the techniques used for hidden surface removal.
  b. Explain the polygon table for the following given surface.
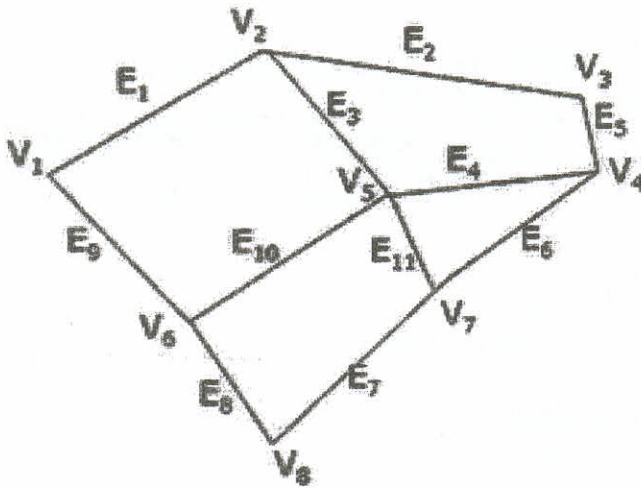
  c. List the properties of B-Spline Curve.
  d. Define following curves with their parametric representation.
      a. Implicit Curve
      b. Bezier Curve
      c. Explicit Curve
      d. B-Spline Curve
      e. Cubic Curve
  e. Explain Painter's Algorithm.
  f. Explain the concept of hidden surface removal.

Q.5. Attempt any THREE of the following: (15)
  a. List andExplain file formats for digital image.
  b. Explain the working of JPEG Image Compression with required steps.
  c. Write a note on Histogram Equalization.
  d. Explain following principles of animation
      a. Squash and stretch.
      b. Anticipation.
      c. Staging.
      d. Straight-ahead action and pose-to-pose.
      e. Follow through and overlapping action.
  e. list and explain filters used for image processing.
  f. Write a note on physics based Animation

DEPARTMENT: BSCIT	SEMESTER: IV
CLASS: SYBSCIT	SUBJECT: Introduction to Embedded Systems
DURATION: 2:30	MARKS: 75

1 Attempt _any three_ of the following: 15

:

a.   Write a short note on :- a.) Memory Operand Addressing Mode b.) Register Operand Addressing Mode c.) Direct Addressing

b.   Explain RAM allocation in detail.

c.   Distinguish between ARM and x86.

d.   Explain ARM Programmer's Model in detail.

e.   Short note on Architecture of PIC microcontroller.

f.   What is ARM and state its advantages and disadvantages.

Attempt _any three_ of the following: 15

a.   What are the Characteristics of DAC.

b.   Explain in detail the working of Analog to Digital Convertor.

c.   Explain Architecture of GSM.

d.   Write a short note on SDH.

e.   Explain Zigbee with its advantages and disadvantages.

f.   Write a short note on:-
     a.) The Base Station System (BSS) b.) The Network Switching System (NSS)

Attempt _any three_ of the following: 15

a.   Explain in detail Communication Functions.

b.   Introduction to Arduino and explain its features.

c.   Explain in detail Advanced I/O Functions.

d.   Explain in detail Analog I/O Functions.

e.   · Explain various pins on Arduino UNO board.

f.   Explain following functions of:-
     a.) digital read(pin) b.) Serial Functions c.) Switch Statement

Attempt _any three_ of the following: 15

a   Explain Servo motor give its Connection and write it's program.

b   Explain Hall Sensor give its Connection and write it's program

c   Write a program of Joystick Module with connection and explanation.

d   Write a program of Temperature and Humidity sensor with connection and explanation.

e   Write program of light sensitive sensor and explain it.

f   Define Thermistors, Infrared Sensors and Thermocouples.

Attempt _any three_ of the following: 15

a.   Write a short note on WI-FI and describe it's benefits and specifications.

b.   Write a short note on GPRS

c.   Explain Wireless Radio Frequency in detail.

d.   Explain working of IR Transmitter and Receiver.

e.   Explain display and software development of Air Quality Monitor using Arduino.

f.   What are the roles of Electric Bolt and Relay in Lock System.

PRAHLADRAI DALMIA LIONS COLLEGE OF COMMERCE & ECONOMICS	
REGULAR , MARCH, 2024	
DEPARTMENT: BSCIT	SEMESTER: IV
CLASS: SYBSCIT	SUBJECT: SOFTWARE ENGINEERING
DURATION: 2:30	MARKS: 75

1.   Attempt _any three_ of the following: 15

a.   Define software engineering. Explain the Software Development Life Cycle (SDLC) steps in brief.

b.   Explain the classification of the software requirements?

c.   Explain the structure of software requirement document.

d.   What are the components of software process? Explain.

e.   Write a short note on Spiral Model.

f.   What are the principles of agile method?

2.   Attempt _any three_ of the following: 15

a.   State and explain the emergent systems properties with example.

b.   Explain the legacy system with the help of diagram.

c.   Explain the simple critical system with example.

d.   Explain the importance of feasibility study in requirements engineering process.

e.   Explain requirement validation process checks on the requirements in the requirement document.

f.   Write short note on i) Context model, ii) Object model.

3.   Attempt _any three_ of the following: 15

a.   Write short note on architectural design decisions.

b.   Write a short note on modular decomposition styles.

c.   Explain user interface design process with the help of diagram.

d.   Write a short note on Project Scheduling.

e.   Explain the risk management process.

f.   What is quality assurance? What are the quality standards types? Explain.

4.   Attempt _any three_ of the following: 15

a   Define verification and validation. Explain software inspection in V & V process.

b   Write short note on Component Testing.

c   Explain Test Automation.

d   Write short note on function point (FP) and Line of Code (LOC) measures.

e   Explain the software cost estimation technique.

f   Explain the Cost Constructive Model (COCOMO) with the formula for computing duration of project and manpower efforts for project.

5.   Attempt _any three_ of the following: 15

a.   Describe the classification of process.

b.   Explain the CMMI Process Improvement Framework.

c.   Explain the services as reusable components.

d.   Explain the Application framework.

e.   Write a short note on COTS product reuse.

f.   What are the architectural patterns for distributed systems? Explain Master-Slave architecture.

23/3/24

PRAHLADRAI DALMIA LIONS COLLEGE OF COMMERCE & ECONOMIC

REGULAR , MARCH, 2024

DEPARTMENT: BSCIT	SEMESTER: IV
CLASS: SYBSCIT	SUBJECT: Core Java
DURATION: 2:30 HRs	MARKS: 75

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1.	**Attempt _any three_ of the following:**	15
a.	Write a short note on Java Virtual Machine.	
b.	Explain Identifiers and rules for creating valid Java identifiers with appropriate examples	
c.	Explain Logical operators in detail with examples. Also, give precedence of logical operators.	
d.	Explain concat(), indexOf() and trim() methods of String class. Give valid examples.	
e.	Explain the main() method in detail with example.	
f.	Write a Java program to demonstrate the substring() method. [**Hint**: If the string is "PROGRAM". The output should be: 1. "GRA" 2. "PROGRAM" 3. "GRAM"]	
2.	**Attempt _any three_ of the following:**	15
a.	Write a Java program using 'while loop' to accept a number from user and print its reverse. Also check if the entered number is a Palindrome or not. [Hint: 1221→Reverse is 1221. Message should be "Entered number is a Palindrome"]	
b.	With an example explain Variable Arguments in detail.	
c.	Explain continue statement in detail with an example. Also draw the output	
d.	Write a Java program to create an abstract class Vehicle with abstract method startEngine() and stopEngine(). Create subclasses Car and Bike using Vehicle class and implement respective methods to start and stop the engine for each Vehicle type.	
e.	Define and explain with example Constructors. Also specify rules for Constructors in Java.	

f.	Write a java program to print the following pattern:
	
	`1`
	`1 0`
	`1 0 1`
	`1 0 1 0`
	`1 0 1 0 1`	

3.	**Attempt _any three_ of the following:**	15
a.	Write a Java program to create an interface Drawable with a method draw() that takes no arguments and returns void. Create three classes Circle and Rectangle that implement the Drawable interface and override the draw() method to draw their respective shapes.	
b.	Differentiate between Abstract classes and Interfaces.	
c.	Write a Java program to create two packages Area and Volume. In Area package create a class Cal_Area consisting of a method circle_area() which contains a floating point-type parameter for radius. In Volume package create a class Cal_Volume consisting of a method cylin_vol() which contains two parameters for radius and height of cylinder of floating point-type. Import these packages in class Shape and display area of circle and volume of cylinder respectively [Formulae: Area of Circle=πr^2, Volume of Cylinder= $\pi r^2 h$]	
d.	With an example explain default base class constructor.	
e.	Define Encapsulation in Java. Why is there a need for packages in Java ? How to create package in Java? Give example.	
f.	Write a java program to implement method overriding.	
4.	**Attempt _any three_ of the following:**	15

a.	What are Exceptions in Java? Explain try-catch block with an example.	
b.	Write a Java program to demonstrate multithreading.	
c.	Write a Java program to accept an Integer from user to check whether entered number is divisible by 99. If the input number is not in correct format or user is attempting to divide by zero then handle the exceptions.	
d.	Define Vectors. What are Vectors? To which package do Vectors belong? How can a Vector be created?	
e.	Write a Java program to add to 3-by-3 matrices and produce a resultant matrix.	
f.	Define Thread. Explain how to create a thread when Runnable interface is used. Give example.	

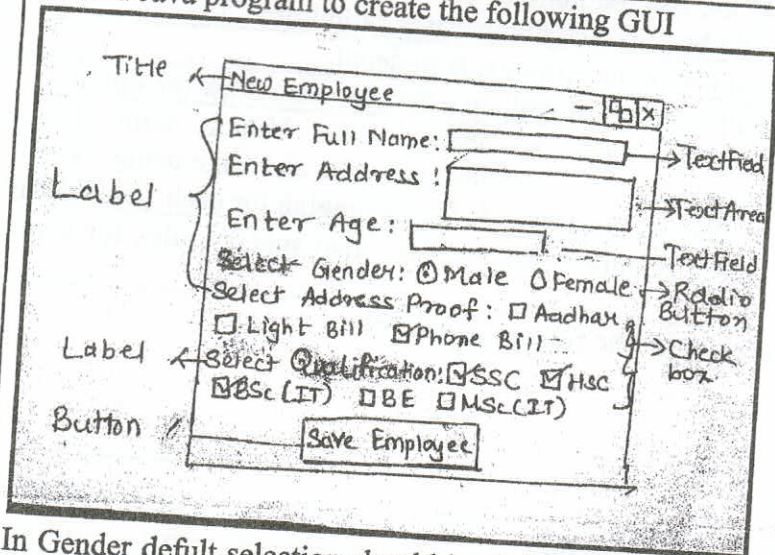|		
5.	**Attempt _any three_ of the following:**	**15**
a.	Explain Checkbox and CheckboxGroup class in detail. Give example.	
b.	Write a Java program to create the following GUI	
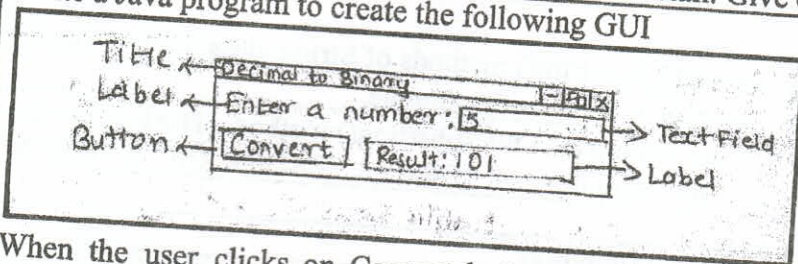
When the user clicks on Convert button, convert the decimal number to binary and display in the Label.

c.	Write a Java program to create the following GUI	

In Gender defult selection should be "Male", in Address Proof default selection should be "Phone Bill" in Qualification default selection should be "SSC" "HSC" and "BSc(IT).

d.	Define an Event. Explain Event Sources and Event Listeners.	
e.	Write a Java program to design the following GUI	
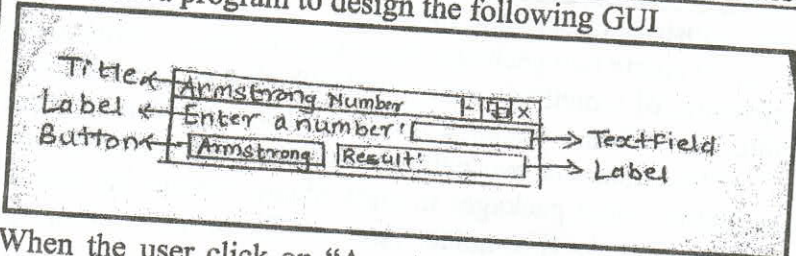
When the user click on "Armstrong" Button display in the Label whether the entered number is an "Armstrong Number" else "Not an Armstrong Number". When the user clicks on close (X) on the Window, the Window should be closed.

f.	Define LayoutManager. Explain GridLayout in detail with an example.	