

GES/SBVC/BVL

Sem End/EXAM/ March 2023

DATE : 25/03/2023

TIME: 2:30 pm To 5.00pm

PROGRAM : S.Y.B.Sc. (IT) –SEM IV

MARKS : 75

COURSE : Introduction to Embedded Systems.

Note : (1) All questions are compulsory.

(2) Make Suitable assumptions wherever necessary and state the assumptions made.

(3) Answers to the same question must be written together.

(4) Numbers to the right indicate marks.

(5) Draw neat labeled diagrams wherever necessary.

(6) Use of Non-programmable calculators is allowed.

1. Attempt ANY THREE from following 15 Marks

- What is an embedded system? Write the need of an embedded system.
- Write a short note on classification of embedded systems.
- Differentiate between Microprocessor and Microcontroller.
- Differentiate between RISC and CISC.
- Explain characteristics of embedded systems.
- Explain the application of embedded systems.

2. Attempt ANY THREE from following 15 Marks

- Explain the working of the washing machine.
- Write a short note on a memory map.
- What is RAM and explain types of RAM.
- Write a short note on flash memory.
- Write a short note on the I/O map.
- Write a C program to toggle bits of P1 ports continuously with a 250ms.

3. Attempt ANY THREE from following 15 Marks

- Draw and explain general architecture of microcontroller 8051.
- Explain types of microcontroller.
- Explain memory organization of 8051.
- Write a short note on time delay in 8051 C.
- Explain pin diagram of 8051.
- Write a short note on the data type of 8051.

P.T.O.

4. Attempt ANY THREE from following

15 Marks

- a) Explain the factors to be considered in selecting a controller.
- b) Why is 8051 most widely used in embedded systems?
- c) Explain debugging in brief.
- d) Explain the linker in brief.
- e) Explain emulator in brief.
- f) What is a compiler? Explain cross compiler.

5. Attempt ANY THREE from following

15 Marks

- a) Write a short note on embedded system development environments.
- b) Explain IDE in brief.
- c) Write a short note on operating systems.
- d) What is kernel? And explain types of kernel.
- e) Explain the features of Real Time Embedded Systems.
- f) Write a short note on the scheduler.

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Sem End/EXAM/ March 2023

DATE : 27/03/2023

TIME: 2:30 pm TO 5.00pm

PROGRAM : S.Y.B.Sc. (IT) –SEM IV

MARKS : 75

COURSE : Software Engineering

Note : (1) All questions are compulsory.

(2) Make Suitable assumptions wherever necessary and state the assumptions made.

(3) Answers to the same question must be written together.

(4) Numbers to the right indicate marks.

(5) Draw neat labeled diagrams wherever necessary.

(6) Use of Non-programmable calculators is allowed.

1. Attempt ANY THREE from following

15 Marks

- a. What is software? Explain characteristics of software.
- b. Explain software development life cycle with the help of diagrams.
- c. Write a short note on: 1. RAD Model 2. Time box Model
- d. Explain the classification of software requirements.
- e. What are the components of a software process? Explain.
- f. What are the principles of agile method?

2. Attempt ANY THREE from following

15 Marks

- a. State and explain emergent properties with examples.
- b. Explain the importance of system dependability and the causes of failure in system dependability.
- c. Explain the process of requirement engineering briefly.
- d. Explain a sample critical system with an example.
- e. Explain notations used in the DFD model with suitable examples.
- f. Explain requirement validation process checks on the requirements in the requirement document.

3. Attempt ANY THREE from following

15 Marks

- a. Define architectural design and explain the advantages of architectural design.
- b. Explain the four major application architectures in brief.
- c. What is the need for UI Design? Explain interface design issues.
- d. Explain software project management briefly.
- e. Explain risk management process.
- f. What is software quality Assurance? Explain the need for SQA.

P.T.O.

4. Attempt ANY THREE from following

15 Marks

- a. Define verification and validation. Explain software inspection in V& V Process.
- b. Write a short note on component testing.
- c. Explain different types of system testing.
- d. Explain the test automation.
- e. Write a short note on function Point FP and line of code LOC measures.
- f. Explain the software cost estimation techniques.

5. Attempt ANY THREE from following

15 Marks

- a. Explain process and product quality.
- b. Explain the different levels of the CMMI framework.
- c. What are the benefits and problems of reusing software?
- d. What is service engineering? Explain process and stages of service engineering process.
- e. Explain the application frameworks.
- f. What are the architectural patterns for distributed systems? Explain Master-slave architecture.

COURSE : Core Java

- Note: (1) All questions are compulsory.
(2) Make Suitable assumptions wherever necessary and state the assumptions made.
(3) Answers to the same question must be written together.
(4) Numbers to the right indicate marks.
(5) Draw neat labeled diagrams wherever necessary.
(6) Use of Non-programmable calculators is allowed.

Q.1 Attempt ANY THREE from following 15 Marks

- a. List and explain any five features of Java.
- b. Explain @Target and @Override annotations in detail.
- c. Explain the semantics and functionality of the given statement:
`public static void main(String args[]) {..}`
- d. Explain the following methods of string.
a. length() b. equals() c. charAt() d. replace() e. trim()
- e. List the types of operators available in java. Explain any two operators with examples.
- f. Difference between an interpreter and a compiler.

Q.2 Attempt ANY THREE from following 15 Marks

- a. Explain the functionality of different types of iteration statements in Java using suitable examples.
- b. Explain: Variable Arguments (varargs).
- c. List and explain the types of variables available in classes.
- d. What is method overloading? Explain it in detail.
- e. Write a short note on the public access modifier and default access modifier.
- f. Explain Parameterized constructor.

Q.3 Attempt ANY THREE from following 15 Marks

- a. Difference between abstract class and interface.
- b. How do you create your own package and import it in a Java program? Explain the procedure stepwise using a suitable example.
- c. Write a program to implement multilevel inheritance with default constructor in each class.
- d. What is the Abstract method in Java? Explain in detail.
- e. What is interface and how to implement an interface?
- f. What is a package? Explain the advantages of packages.

Q.4 Attempt ANY THREE from following

15 Marks

- a. Explain two dimensional arrays in detail.
- b. What is the values() and valueOf() method? Explain with examples.
- c. Explain the use of enumeration data type in Java.
- d. Define Stream. Explain how we can write binary data to a file.
- e. Explain the types of exception handling with examples.
- f. Explain the life cycle of thread with a neat labeled diagram.

Q.5 Attempt ANY THREE from following

15 Marks

- a. Explain WindowEvent class in detail along with its methods.
- b. List the various layouts used in Java in detail. Explain any one layout with examples.
- c. Explain the MouseEvent class in detail.
- d. Briefly explain: delegation model.
- e. Write an AWT based java program that will read a number from the user (textbox) and display its factorial (label).
- f. What is a Container? Explain any four containers in AWT.

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Sem End/EXAM/ March 2023

DATE :29/03/2023

TIME: 2.30pm to 5.00pm

PROGRAM : S.Y.B.Sc. (IT) –SEM IV

MARKS : 75

COURSE : COMPUTER GRAPHICS AND ANIMATION.

Note : (1) **All** questions are **compulsory**.

(2) Make **Suitable assumptions** wherever necessary and **state the assumptions** made.

(3) Answers to the **same question** must be **written together**.

(4) Numbers to the **right** indicate **marks**.

(5) Draw **neat labeled diagrams** wherever **necessary**.

(6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt ANY THREE from following

15 Marks

- a. What is computer graphics? Explain applications of it.
- b. What are the properties of video display devices?
- c. Distinguish between raster scan and random scan display devices.
- d. Explain cohen-sutherland and liang barsky line clipping algorithm.
- e. What is the DDA line drawing algorithm? Explain the advantages of it.
- f. Explain the concept of clipping.

2. Attempt ANY THREE from following

15 Marks

- a. What is a polygon? Explain types of it with diagrams.
- b. What is transformation? Explain in brief.
- c. Explain a homogeneous coordinate system in 3D.
- d. Explain in a brief window to viewport transformation with a neat diagram.
- e. What is translation transformation? Explain it with an example.
- f. What is Combine transformation? Explain the advantages of it.

3. Attempt ANY THREE from following

15 Marks

- a. Explain the concept of viewing in 3D.
- b. Explain canonical view volume in brief.
- c. Explain stages in 3D viewing with neat labeled diagrams.
- d. Explain colorimetry in detail.
- e. Write a short note on radiance.
- f. Explain the concept of BRDF in brief.

P.T.O.

4. Attempt ANY THREE from following

15 Marks

- a. What is visible surface determination ? Explain different methods of it.
- b. Explain back face removal algorithm in brief.
- c. Explain the concept of scan line method in brief.
- d. Explain the Painter's algorithm .
- e. Write a short note on curve representation .
- f. Explain the concept of cubic spline in brief.

5. Attempt ANY THREE from following

15 Marks

- a. What is an image? Explain different image file formats
- b. Explain Basic Principles of animation in brief.
- c. Explain the difference between straight ahead and pose to pose action.
- d. What is keyframing ? Explain advantages of Keyframing .
- e. What is deformation ? Explain different types of deformation .
- f. What is animation? Explain the advantages of it.

COURSE : COMPUTER ORIENTED STATISTICAL TECHNIQUES

- N.B.: (1) All Questions are **compulsory**.
 (2) Make **suitable assumptions** wherever necessary and state the assumption made.
 (3) Answer to the same question must be **written together**.
 (4) **Numbers** to the right indicate **marks**.
 (5) Use of **Non-Programmable calculator** is allowed.

Q.1 Answer any three of the following.

15 Marks

1) Find the value of P, if mean of following distribution is 7.5

X	3	5	7	9	11	13
F	6	8	15	P	8	4

2) Calculate standard deviation of following data.

Size	7	8	9	10	11	12
Frequency	13	13	8	17	5	4

3) What are the values of these sums?

$$(a) \sum_{k=1}^5 (k + 1) \quad (b) \sum_{k=5}^8 (k^2 + 2k + 1)$$

4) Compute semi-interquartile range(QD) for following data.

C.I.	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90
Frequency	8	12	20	25	15	9	6	5	5

5) Calculate the median.

Size	5	6	7	8	9	10	11	12	13
Frequency	48	52	56	60	63	57	55	50	52

6) Two variables, X and Y, assume the values $X_1 = 2, X_2 = -5, X_3 = 4, X_4 = -8$ and $Y_1 = -3, Y_2 = -8, Y_3 = 10, Y_4 = 6$, respectively. Calculate:

$$i. \sum XY, \quad ii. \sum X \sum Y, \quad iii. \sum XY^2, \quad iv. \sum X^2, \quad v. \sum (X - Y)(X + Y)$$

Q.2 Answer any three of the following.

15 Marks

- 1) Find first four moments about point 4 for the set of observations 1,2,3,3,6.
- 2) Calculate S_k for the following observation.
2,3,5,7,4,8,1
- 3) If a pair of dice is thrown and X denotes the sum of the numbers on them. Find probability distribution of X. Also, find the expectation of X.
- 4) What is kurtosis? Explain its types.
- 5) A pair of dice is thrown. If sum of numbers is an odd number, what is the probability that sum is divisible by 3?
- 6) How many 2-digit number can be formed with the digits 3,5,6,7,8 if none of the digit is being repeated in any of the numbers so formed?

Q.3 Answer any three of the following.

15 Marks

- 1) What is Hypothesis? Explain its types.
- 2) For a given sample of 100, 35 are working as a professor. Construct a 95%, confidence Interval for the probability that almost most of the education people from the samples working as a professor.[95%=1.96]
- 3) In a study of television viewing habits, order to obtain an interval estimate of the average number of hours per week that teenagers spend watching television programs, a random sample of 100 teenaged children is taken. Sample investigation revealed a mean of 9.2 hours, with standard deviation of 3.2 hours. Obtain the desired interval estimate with confidence coefficient 0.99.[99%=2.58].
- 4) The average weight of the bolts produced by a certain machine is to estimated on the basis of a sample of size ten given weight (in gms) as 5.10,4.98,5.03,4.99,5.00,5.07,5.04,5.03,4.91,4.97
- 5) A random sample of 45 individuals selected from a certain population showed that 5 of them are right handers. Construct 95% confidence interval that limits within which the proportion right handers in the population lies almost certainly.[95% = 1.96].
- 6) What is Estimation? Explain its Types.

Q.4 Answer any three of the following.

15 Marks

1)) The mean lifetime of sample of 100 fluorescent light bulbs produced by a company is found to be 1570 hours with standard deviation 140 hours test the hypothesis that mean lifetime bulbs produced by company is 1600 hours the alternative hypothesis that it is less than 1 at 5 % level of significance.($t < -1.64$)

2) Two sample polls of votes for two candidates A and B for a public office are taken, one from among the residents of rural areas. The results are given in adjoining table. Examine whether the nature of the area is related to voting preference in this election by using chi-square test at 5% level of significance.[5% LOS = 3.841]

Area	Votes for		
	A	B	
Rural	620	380	1000
Urban	550	450	1000
Total	1170	830	2000

3) Two random sample were drawn from 2 normal population and values are test whether 2 population have same variance at 5% LOS.(5%=3.35)

A	16	17	25	26	32	34	38	40	42		
B	14	16	24	28	32	35	37	42	43	45	47

4) Two sample of size 10 & 15 are drawn from two normal distributed population having variance 40 & 60 respectively. [LOS 5%= 4.03]

5) Calculate the chi-square value for the following data.[LOS 5%= 5.99]

Colour	Red	Green	Yellow
Observed Frequency	12	16	20
Expected Frequency	16	8	15

6) Data represent the last digit of the scooter passing at a certain traffic signal observe during last one hour for 180 scooter. Claim that all the digits are equally likely and occur at 5% level of significance [LOS 5% = 16.9]

Last digit	0	1	2	3	4	5	6	7	8	9
frequency	12	20	14	12	21	18	17	26	19	21

Q.5 Answer any three of the following.

15 Marks

1) Show that the equation of straight line which passes through the points (X_1, Y_1) and (X_2, Y_2) is given by

$$Y - Y_1 = \frac{Y_2 - Y_1}{X_2 - X_1} (X - X_1)$$

2) Following table shows the respective masses X and Y of a sample of 12 fathers and their oldest sons. Find the least square regression line of Y on X.

X	65	63	67	64	68	62	70	66	68	67	69	71
Y	68	66	68	65	69	66	68	65	71	67	68	70

3) Find straight line equation for the following:

X	1	3	4	6	8	9	11	14
Y	2	4	5	6	7	10	9	12

4) Compute Total variation

X	65	63	67	64	68	62	70	66	68	67	69	71
Y	68	66	68	65	69	66	68	65	71	67	68	70

5) Find a) The slope b) the equation c) the Y intercept d) X intercept of the line which passes through the points (3,4) and (2,-2).

6) Fit a straight line trend value for the following series. Estimate the number of production units for 2002.

Year	1995	1996	1997	1998	1999	2000	2001
Production Unit	125	128	133	135	140	141	118
