IV 05118 III 11

SYBSc I.T
5/4/23

Date:

Duration: 2 1/2hrs **Max. Marks: 75**

N.B.: (1) All questions are compulsory.
(2) Make a 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) Draw neat labeled diagrams wherever necessary.
(6) Use of Non-programmable calculator is allowed.

Q.1 **Attempt any three of the following:** (15)
A] Differentiate between general purpose computer and embedded system.
B] List and explain the classifications of embedded system.
C] Write a note on big endian and little endian processors.
D] With a diagram explain reset circuit.
E] List and explain the operational quality attributes of embedded system.
F] With an example explain the concept of embedded system.

Q.2 **Attempt any three of the following:** (15)
A] Write a note on interrupt map.
B] With an example explain application specific embedded system.
C] List and explain the types of ROM.
D] Write a note on memory testing.
E] Explain timer driver component in embedded system.
F] With a diagram explain memory map.

Q.3 **Attempt any three of the following:** (15)
A] Write the criteria for choosing a microcontroller.
B] Explain use of C programming for embedded system with an example.
C] Write a note on time delay in 8051 microcontroller.
D] Explain the I/O programming in 8051 embedded C programming.
E] With a diagram explain the external memory interface with 8051 microcontroller.
F] Explain microcontrollers and embedded processors.

Q.4 **Attempt any three of the following:** (15)
A] State the advantages of 8051 microcontroller.
B] Write a note on debugging the embedded software code.
C] Explain the build process in embedded system.
D] With an example explain infinite loop used in embedded C programming.
E] Explain the process of downloading embedded software code.
F] State the advantages of high level language for embedded system

Q.5 **Attempt any three of the following:** (15)
A] What are the factors to be considered to select an RTOS?
B] With a diagram explain the embedded system development environment.
C] List and explain the various files generated during the cross compilation.
D] Write a note on debugger.
E] What is a RTOS? How does it differ from a general embedded operating system?
F] Explain the types of embedded operating system.

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IV 05|20 III 18

SYBSc I:T
6/4/23

Duration: 2:30 hours

Max. Marks: 75

N.B.: (1) All questions are compulsory.
(2) All questions carry equal marks.
(3) Use of scientific calculator is allowed.
(4) Figures to the right indicate maximum marks allotted to the sub-questions.

Q.1 Attempt any three of the following: 15

A Find Mean deviation from mean and its coefficient for the following row data.
168, 164, 172, 169, 178, 173, 173.

B The mean and standard deviation of a set of 20 observations were found to be 40 and 5 respectively. Later it was found that two observations 15 and 20 was wrongly recorded as 25 and 10. Find the correct mean and correct standard deviation.

C The scores of two Batsman in an one over are listed below. Find which one is better scorer and which one is consistent.

Balls	1	2	3	4	5	6
Batsman A	4	6	6	1	0	6
Batsman B	3	4	2	3	4	2

D State the Properties of Arithmetic Mean.

E Find Median for the following frequency distribution.

C.I.	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	4	14	13	35	20	22	4

F State the Merits and demerits of Mode.

Q.2 Attempt any three of the following: 15

A First 3 moments about 2 are 1, 16, -40 respectively, find γ_1.

B From the past experience it is known that A can solve 2 problems out of 5and B can solve 3 problems out of 7. Both are trying independently. Find the probability that
(i) Problem remains unsolved (ii) Problem is solved (iii) Only 1 of them solve a problem

C Find Bowley coefficient skewness for following distribution.

Groups	0-5	5-10	10-15	15-20	20-25
frequency	7	19	14	10	10

D Find Mean and variance for the following random variable:

X	0	1	2	3	4	5
P(X)	0.23	0.3	0.3	0.1	0.05	0.02

E Defined the following terms: (i) Independent event (ii) Impossible Events (iii) Certain Event

F Find Pearson coefficient of skewness for the following data: 7,5,6,8,9,4,5,8

Q.3 Attempt any three of the following: 15

A Write a note on Point Estimation.

B Marks obtain by a group of 15 students with mean 55 and variance 49 what are the 99% confidence limit for the mean of the population assuming it to be normal distribution? (Z

value = 2.58)

C The mean score of random sample of 60 objects was found to be 145 with standard deviation of 40. Construct 95% Confidence level for the true mean.

D The incidence of particular disease in a area is such that 20% people of that area suffers from it. What size of sample be taken 50 as to ensure that the error of estimation of the proportion should not be more than 5% with 95% confidence.(Z value = 1.96)

E If X follows normal distribution with mean 120 and standard deviation 40, find
(i)P(X < 140) (ii) P(X > 110) (iii) P(110 < X < 140)
(Given area between Z=0 to Z=0.5 is 0.6916 & Z=0 to Z=0.25 is 0.0.0987)

F Define Central limit Theorem.

Q.4 Attempt any three of the following: 15

A A coin was tossed 200 times and heads was observed 105 times. Compute the confidence interval at 5% level of significance. (Z value = 1.96)

B State the properties of "t" distribution.

C A random sample of 100 bundles gives a mean of 8.5 tons and standard deviation 4 tons. Can the sample be regarded as drawn from a population with mean 7 tons? Test this at 5% level of significance. (Z value = 1.96)

D State the properties of chi Square distribution.

E The standard deviation of two population is 2.5 and mean of two large sample sizes 1000 and 2000 are 67.5 and 68 respectively. Test the equality of means. ($z_\alpha = 1.96$)

F In a random sample of 500 in a city, it was found that 160 preferred seafood. Find 95% confidence interval for actual proportion of people who preferred seafood.($z_\alpha = 1.96$)

Q.5 Attempt any three of the following: 15

A Given the two regression equations as 2X - Y – 15 = 0 and 3X - 4Y + 25 = 0. Identify the regression lines and Find mean of X and Y.

B Fit a linear trend by the method of least square. Also find trend value for 7th month.

Month	1	2	3	4	5	6
Value	1325	1310	1340	1355	1375	1430

C Fit a second degree curve to the following data:

X	5	10	15	20	25	30
Y	11	13	16	20	28	36

D For a Following Bivariate date with mean and variance as :

	x	y
Mean	3	4
Variance	2.5	0.5

And the covariance as 0.25 , Find y when x = 4

E If n=10, $\sum x=25$, $\sum y=47$, $\sum xy=93$, $\sum x^2=85$, $\sum y^2=251$ find Correlation Coefficient.

F State the Properties of Correlation coefficient.

IV 05123 III 25

8/4/23
SY I.T

Date:

Duration: $2^{1/2}$hrs **Max. Marks: 75**

N.B. 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume the necessary data.

Q.1. Attempt any THREE of the following:

a) What is Software Engineering? Describe Software Engineering as layered technology. (5)
b) State the Software Development Life Cycle (SDLC) phases in brief. (5)
c) What is Software Requirement Specification (SRS)? Describe the quality criteria for good SRS. (5)
d) Define software requirements. Differentiate functional and non-functional requirements. (5)
e) Write a short note on Rapid Application Development (RAD). (5)
f) Explain Extreme Programming (XP) as Agile development model. (5)

Q.2. Attempt any THREE of the following:

a) Explain the phases of requirement engineering. (5)
b) What is socio-technical system? State essential characteristics of socio-technical system. (5)
c) Describe the security terminology and security assurance in detail. (5)
d) Write a short note on legacy system. (5)
e) Illustrate the example of medical system as a safety critical system. (5)
f) What is the need of E-R diagram? List out the types of relationship in E-R diagram. (5)

Q.3. Attempt any THREE of the following:

a) Explain the any one model in which the system is organized. (5)
b) Write a short note on risk analysis process. (5)
c) Describe various management activities in detail. (5)
d) State the User Interface (UI) design principles briefly. (5)
e) Which activities are performed during project scheduling? (5)
f) Define quality. Explain the importance of software quality. (5)

Q.4. Attempt any THREE of the following:

a) Distinguish between Verification and Validation. (5)
b) What is automation testing? Give reasons to highlight the importance of test automation. (5)
c) Discuss the concept of software productivity? List the benefits of calculating software productivity. (5)
d) Explain the concept of software testing (5)
e) Describe the software inspection process in detail. (5)
f) Define the term 'software measurement'. Which activities are carried out to measure software? (5)

Q.5. Attempt any THREE of the following:

a) Define the term 'processes'. Explain different classes of process. (5)
b) Write a short note on Service Oriented Software Engineering (SOSE). (5)
c) Explain the concept of software reuse. (5)
d) Which designing issues are raised while designing the distributed system? Explain in detail (5)
e) What is process improvement? Describe the stages of process improvement in detail. (5)
f) Discuss client-server computing in brief. (5)

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IV 05126 III 33

SYIT
10/4/23

Date:

Duration: $2^{1/2}$ hrs Max. Marks: 75

N.B. 1) All questions are compulsory.

2) Figures to the right indicate full marks.

3) Assume the necessary data.

Q.1. Attempt any THREE of the following:

a) What is computer graphics? Explain it's applications. (5)
b) Write a short note on working of LCD. (5)
c) Explain basic concept of video. (5)
d) Define Raster and Vector scan. (5)
e) Write a short note on midpoint circle algorithm. (5)
f) What is polygon clipping? (5)

Q.2. Attempt any THREE of the following:

a) Write a C code to demonstrate 2D translation. (5)
b) List and explain the basic 2D transformation. (5)
c) Compare and contrast orthographic, Axonometric and oblique projections. (5)
d) Write a short note on rotation about arbitrary point. (5)
e) Distinguish between window port and view port. (5)
f) Explain homogeneous coordinates and matrix representation of transformation. (5)

Q.3. Attempt any THREE of the following:

a) Define chromaticity in detail. (5)
b) Write a short note on color model. (5)
c) Differentiate between radiometry and photometry. (5)
d) List down the various stages in 3D viewing. (5)
e) Explain the term view plane coordinate and specifying view volume. (5)
f) What is white balance and grey balance? (5)

Q.4. Attempt any THREE of the following:

a) List and Explain different types of coherence. (5)
b) Discuss the cubic spline in detail. (5)
c) Explain z-buffer algorithm in detail. (5)
d) What is benzier curve? (5)
e) Define the parametric equation for parabola and ellipse. (5)
f) Write a short note on back face detection method. (5)

Q.5. Attempt any THREE of the following:

a) List and explain types of animation. (5)
b) Write a short note on basic principle of animation. (5)
c) What is deformation effect? (5)
d) Explain the procedure of character animation. (5)
e) Write a short note on physically based animation in gaming and suimulation. (5)
f) Explain the categories of procedural animation. (5)

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W 05117 03

SY I.T
3/4/23

Date:

Duration: $2^{1/2}$hrs **Max. Marks: 75**

N.B. 1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume the necessary data.

Q.1. Attempt any THREE of the following:

a) What is Java Virtual Machine (JVM)? Explain JVM Components. (5)
b) List and explain any five features of JAVA. (5)
c) What are the primitive data types in Java? Briefly explain their size, range and other details. (5)
d) Explain the structure of Java program. (5)
e) Explain the following (5)
   i. Autoboxing and unboxing
   ii. Java Development Kit (JDK)
f) Define the following methods for String. (5)
   i)length() ii)equals() iii) charAt() iv) compareTo() v)substring()

Q.2. Attempt any THREE of the following:

a) Explain the need of variable arguments with the help of an example. (5)
b) When do we use keywords final and static? Explain the working of static member functions. (5)
c) What is garbage collection in Java? How it is helpful? (5)
d) When do we use switch-case statement? Explain it with example. (5)
e) Explain in detail the working of 'foreach' loop in Java. (5)
f) What do you mean by method overloading? Write a program to implement the concept of method overloading. (5)

Q.3. Attempt any THREE of the following:

a) Explain the concept of method overriding with the help of an example. (5)
b) Write a program to implement the concept of multilevel inheritance. (5)
c) Differentiate between classes and interfaces. (5)
d) What is an interface? How can we implement interface in a class? (5)
e) Write a program to illustrate the concept of abstract method and abstract class. (5)
f) What is the purpose of a package? Explain the steps to create user define packages in Java. (5)

Q.4. Attempt any THREE of the following:

a) Define Stream. Explain how we can write binary data to a file? (5)
b) How is a Vector different from an array? How can you create a Vector in Java. (5)
c) Explain life cycle of a Thread. (5)
d) What are the different ways of creating a new Thread in Java? (5)
e) Explain the concept of streams and types of streams available in Java. (5)
f) Write a program to copy one file to another file, where file names are entered through command line. (5)

Q.5. Attempt any THREE of the following:

a) What is an Applet? Explain its life cycle in Java. **(5)**

b) How the concept of inner classes helps in Java to handle events? Explain with the help of interface MouseListener **(5)**

c) What is the role of layout manager? What is the default layout of frame? Explain its working. **(5)**

d) Explain checkbox class along with its constructors in detail. **(5)**

e) Write a program to demonstrate the use of Canvas. **(5)**

f) What is the use of adapter class in Java? Explain any one of the adapter classes defined in Java. **(5)**

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