S.Y.Bsc.(I.T.) Sem-IV

OCE 2016

Con. 6-16.

HP-4728

Software Engineering

(3 Hours)

[Total Marks : 100

1. Answer the following questions :—
   (a) What is the attribute of good quality software ? **5**
   (b) Write the difference between system software and application software. **5**

2. Answer the following question :—(Any **Three**)
   (a) Describe the critical system. **5**
   (b) Write and draw the difference phases of Water Fall Model. **5**
   (c) What is the meaning of Risk Management ? **5**
   (d) Explain the Functional and Non-functional requirement. **5**

3. Answer the following question :—(Any **Three**)
   (a) What the need of feasibility study in software development ? **5**
   (b) Explain the SRS. **5**
   (c) Write the need of ERD (Entity Relation Ship Diagram) in Data Modelling. **5**
   (d) What is the advantage and disadvantage of Object Model ? **5**

4. Answer the following question :—(Any **Three**)
   (a) What is the use of Data Dictionary in Data Base ?
   (b) Write the following concept in short :—Class, Object, and Inheritance. **5**
   (c) Describe the principles of Design Modelling. **5**
   (d) Explain the Top- Down And Bottom-Up Design Model. **5**
   5

5. Answer the following question :—(Any **Three**)
   (a) What is the need of UI (User Interfaces) in Software Engineering ?
   (b) Explain the Process Quality and Product quality in detail. **5**
   (c) Describe the client server model. **5**
   (d) Write a short note on Verification and Validation. **5**
   5

6. Answer the following question :—(Any **Three**)
   (a) Explain V & V model with neat and clean diagram. **5**
   (b) What is the meaning of system testing ? **5**
   (c) Write the feature of UML. **5**
   (d) Describe the White Box And Black Box Testing. **5**

7. Answer the following question :—(Any **Three**)
   (a) Explain Prototyping Model with the help of diagram. **5**
   (b) What is Quality assurance ? **5**
   (c) Write the advantages of Integration Testing. **5**
   (d) Describe the Requirement Engineering with its task. **5**

S.Y.Bsc.(I.T.)-Sem-IV

Oct 2016

Con. 7-16.

HP-4971

Multimedia

(3 Hours) [Total Marks : 100

N.B. : (1) **All** questions are **compulsory**. **(Q. 1 to Q. 7).**
(2) Interneal option are their

1. What is multimedia ? Explain its application ? **10**

2. Attempt any **three** questions :—
   (a) What is information KIOSK ? **5**
   (b) Describe different type of database. **5**
   (c) Give the list of file and give full form it ? **5**
   (d) List different type of software used in multimedia system. **5**

3. Attempt any **three** questions :—
   (a) How can analog signals be represented as waves ? **5**
   (b) Explain the fundamental properties of waves ? **5**
   (c) What is pulse modulation & what are its different variants ? **5**
   (d) Distinguish between periodic and periodic waves. **5**

4. Attempt any **three** questions :—
   (a) List different types of Scaner. **5**
   (b) What is a sinusoidal wave and why are they regarded as elementary building blocks ? **5**
   (c) Describe True type font. **5**
   (d) What is CCD ? State is use. Describe its Operation. **5**

5. Attempt any **three** questions :—
   (a) How sound Flow from one place to another place ? **5**
   (b) What is Raster ? **5**
   (c) What is color ? List different types if colors ? **5**
   (d) What the basic components of the audio system describe ? **5**

6. Attempt any **three** questions :—
   (a) What is compression and Decompression ? **5**
   (b) List different video compression technique. **5**
   (c) List the different encoding technique. **5**
   (d) Describe the Lossy and Lossless compression technique. **5**

7. Attempt any **three** questions :—
   (a) What is Metaphor Describe ? **5**
   (b) List and design issues in Multimedia presentation. **5**
   (c) What is authoring ? **5**
   (d) Describe Feature of Macromedia Flash. **5**

S.Y.Bsc.-(IT) Sem-IV Oct 2016

Con. 8-16. JAVA & Data Structure HP-4524

(3 Hours) [Total Marks : 100

N.B. : (1) **All** questions are **compulsory**.
(2) **Numbers** to the **right** indicate **marks**.

1. (a) Explain JVM in brief. 5
   (b) Does Java support multiple inheritances ? Justify your answer. 5

2. Attempt any **three** of the following :—
   (a) Explain the Features of Java. 5
   (b) Give the meaning of public static void main(String a[]) 5
   (c) What are constructors ? Explain different types of constructor with example. 5
   (d) With the help of suitable JAVA programs describe following function Overloading. 5

3. Attempt any **three** of the following :—
   (a) What is Inheritance ? Explain different types of inheritance supported by Java with an example. 5
   (b) Define a package, and give the list of steps used to create a package in Java. Explain with a sample code 5
   (c) Discuss on the visibility of base class members in privately and publicly inherited classes. 5
   (d) What is a Java Exception & its Types ? Define try, catch, and throw in an Exception block. 5

4. Attempt any **three** of the following :—
   (a) What is meant by stream ? What are the types of streams and classes ? Explain in detail. 5
   (b) Explain how to create files and directories with the help of java files class. 5
   (c) What is the necessity of two types of streams - byte streams and character streams ? 5
   (d) List the methods in InputStream and Reader class. 5

5. Attempt any **three** of the following :—
   (a) Define Stack. Explain the various operations are performed on the stack and give some applications of stack. 5
   (b) How do you find the complexity of an algorithm ? What is the relation between the time and space complexities of an algorithm ? Justify your answer with an example. 5
   (c) What is Queue in data structure ? State the algorithm for ENQUEUE (insert element in Queue) and DEQUEUE (delete element from Queue). 5
   (d) Define Binary Search. Write an algorithm for Binary Search method and explain its analysis. 5

[TURN OVER

6. Attempt any **three** of the following :— 5

(a) What is linked list ? Explain the different types of linked list. 5

(b) What are expression trees? Represent the following expression using a tree. Comment on the result that you get when this tree is traversed in Preorder, Inorder and postorder. (a-b) / ((c*d)+e). 5

(c) Define Hashing. How do collisions happen during hashing ? Explain the different techniques resolving of collision. 5

(d) What are the advantages and disadvantages of linked list ? 5

7. Attempt any **three** of the following :— 5

(a) Define node, degree, siblings, depth/height, level. 5

(b) What is a heap? Give three properties of heaps ? 5

(c) Explain an algorithm for the Bubble Sort. 5

(d) Which are the two standard ways of traversing a graph ? Explain them with an example of each. 5

———V———

S.Y.B.Sc.(I.T.)- Sem-IV

Oct 2016

Con. 9-16.

Quantitative Techniques

HP-4985

(3 Hours) **[Total Marks : 100**

N.B. : (1) **All** questions are **compulsory**.
(2) From question **2** to **7**, **Sub-question (a)** is **compulsory** and attempt any **one** from **(b)** and **(c)**.

1. Attempt any **one** of the following :—
   (a) Find the root of the equation $f(x) = 3x - \cos x - 1 = 0$ by using Newton Raphson's method with initial value $x_0 = 1$. (upto five iteration) **10**
   (b) Solve the following equations by using Gauss Jordon method correct upto three decimal places $x + 2y + 6z = 22$, $3x + 4y + z = 26$, $6x - y - z = 19$. **10**

2. (a) Find a real root of the equation $x^3 - 2x - 5 = 0$ by method of false position correct upto to three decimal places. **8**

   (b) Evaluate $\int_0^1 \sqrt{\sin x + \cos x}\, dx$ taking 5 sub intervals in trapezoidal rule. **7**

   (c) Find f (7) by Lagrange's formula. **7**

Age (x)	0	2	5	8	10	12
Weight(y)	7.5	10.25	15	16	18	21

3. (a) Evaluate $\int_0^{\pi} \frac{\sin^2 x}{5 + 4\cos x} dx$ by taking 5 ordinates by Simpson's $\left(\frac{1}{3}\right)^{rd}$ rule. **8**

   (b) Use Taylor's series method to solve the equation $\frac{dy}{dx} = x^2y - 1; y(0) = 1$. Find y (0.03) by taking $h = 0{\cdot}01$. **7**

   (c) $\frac{dy}{dx} = x + y + xy$ With y (0) = 2 estimate y (2) by Euler's method taking h = 0.5. **7**

4. (a) The following data represents the demand (x) and supply (y) both in thousands of units of a certain commodity during first seven months of 2010. **8**

Months	1	2	3	4	5	6	7
Demand (x)	1	2	3	4	5	6	7
Supply (y)	2	4	7	6	5	6	5

Find the regression equation and hence the correlation coefficient. Also estimate the supply when the demand is 8,000.

   (b) Compute the coefficient of correlation for the following data :— **7**

X	7	9	8	5	6	3	4	1	2
Y	18	20	19	21	24	26	25	23	27

   (c) Find standard deviation and variance of the data given below :— **7**

X	10	20	30	40	50	60	70	80	90	100
Y	12	19	31	38	46	44	37	23	13	7

[TURN OVER

5. (a) A random variable X follows poisson distribution with mean = 2.5. Find (i) $P(X = 3)$, (ii) $P(X \leq 2)$, (iii) $P(X \geq 1)$, iv). $P(1 \leq X \leq 3)$. **8**

(b) In a certain city 20% of person's are vegetarians. If 5 persons from the city are chosen at the random, find the probability that, (i) None is vegetarian (ii) Atleast one is vegetarian. 7

(c) In a certain lottery, one prize of Rs. 1000/- three prizes of Rs. 500/- each five prizes of Rs. 100/- each and 10 prizes of Rs. 50/-. each are to be awarded to 19 tickets drawn from the total number of 10000 tickets sold at prize of Rs. 1/- per ticket. Find the expected net gain, to the person buying a particular ticket. 7

6. (a) Following are two samples from two different populations. Can we say that the two population have same mean. **8**

Sample I : 25, 32, 30, 34, 24, 14, 32, 24, 30, 31, 35, 25.

Sample II : 44, 34, 22, 10, 47, 31, 40, 30, 32, 35, 18, 21, 35, 29, 22.

(b) 300 out of 550 people in a survey were men and 220 out of 400 were found to be men in an another survey. Does this survey represent the same population ? 7

(c) A manufacturer claims that 10% of his product is defective. A sample of 300 items selected at random had 32 defective items. Test his claim at 1 % level of significance. 7

7. (a) A manufacturer of furniture makes two products chairs and tables. Processing of these products is done on two machines A and B. A chair requires 2 hours on machine A and 6 hours on machine B. A table requires 5 hours on machine A and no time on machine B. Time available per day on machine A and B are 16 and 30 hours respectively. Profits earned from a chair and a table are Rs.50 and Rs.250 respectively. Formulate the LPP and solve graphically to maximize the profit. **8**

(b) A sample from normal population is as under : 12, 9, 8, 7, 8, 9, 12, 11, 15, 12, 16. On the basis of above values can we say that the variance of population is 2.5 ? Use 5% level of significance. 7

(c) A sample of size 16 from Normal population has Standard Deviation 12. Can we say that population standard deviation is 10 ? Given level of significance is 5%. 7

———V———

Sem-IV

S.Y.Bsc – (I.T.)

Oct 2016

Con. 10-16.

Embedded Systems

HP-4334

(3 Hours)

[Total Marks : 100

1. Attempt following questions :—
   (a) Write a short note on watchdog timer. 5
   (b) Distinguish between microprocessor and microcontroller. 5

2. Attempt any **three** questions from the following :—
   (a) Distinguish between RISC and CISC. 5
   (b) Explain 12C bus in embedded system. 5
   (c) What are COTS in embedded system ? 5
   (d) Explain the classification of embedded systems on the basis of complexity. 5

3. Attempt any **three** questions from the following :—
   (a) Explain the role of embedded system in automotive domain with an example. 5
   (b) Explain different automotive communication buses in embedded systems. 5
   (c) Explain any three characteristics of embedded systems. 5
   (d) Explain the following operational quality attributes of embedded systems. 5
       (i) Security (ii) Throughput

4. Attempt any **three** questions from the following :—
   (a) Explain the role of an infinite loop? Illustrate with an example. 5
   (b) Explain the concept of device programmer in embedded systems. 5
   (c) Explain linking process in embedded systems. 5
   (d) Write a short note on compiler and cross compiler. 5

5. Attempt any **three** questions from the following :—
   (a) What do you mean by memory testing ? Explain data bus test in detail. 5
   (b) Write a short note on CRC in embedded systems. 5
   (c) Write a short note on direct memory access. 5
   (d) Differentiate between SRAM and DRAM. 5

6. Attempt any **three** questions from the following :—
   (a) Explain following scheduling algorithms. 5
       (i) Shortest job first (ii) priority based
   (b) Enlist steps to develop device driver in embedded systems. 5
   (c) Explain real-time characteristics of embedded operating systems. 5
   (d) Write a short note on mutex in embedded operating system. 5

7. Attempt any **three** questions from the following :—
   (a) Write a short note on emulator. 5
   (b) What are the objectives of Embedded product Development Life Cycle ? 5
   (c) Write short notes on disassembler and decompiler. 5
   (d) What are the different phases of Embedded product Development Life Cycle ? 5