

Software Engineering

Con. 387-18.

GP-6098

(3 Hours)

[Total Marks : 100

- N.B. : (1) All questions are compulsory.
 (2) Draw diagrams wherever necessary.
 (3) Figures to the right indicate marks.

1. Answer the following :—
 - (a) Explain the classification of the software requirements. 5
 - (b) Write a short note on Quality Control. 5
2. Answer any three of the following :—
 - (a) Explain the structure of software requirement document. 5
 - (b) State and explain the emergent properties with example. 5
 - (c) Explain different types of Critical system. 5
 - (d) What is the meaning of Risk Management ? 5
3. Answer any three of the following :—
 - (a) What is legacy system ? Explain it with help of diagram. 5
 - (b) Explain SRS in brief. 5
 - (c) Explain the simple critical system with suitable example. 5
 - (d) What is the need of feasibility study in software development ? 5
4. Answer any three of the following :—
 - (a) Write a short note on modular decomposition styles. 5
 - (b) What is the use of Data Dictionary in Database ? 5
 - (c) Describe the principles of Design Modelling. 5
 - (d) Explain user interface design process with the help of diagram. 5
5. Answer any three of the following :—
 - (a) Explain the risk management process. 5
 - (b) Write a short on Event processing system. 5
 - (c) Write short note on project scheduling. 5
 - (d) Describe Client-Server Model. 5
6. Answer any three of the following :—
 - (a) What is quality assurance ? What are the quality standards types ? 5
 - (b) Write a short note on System Testing. 5
 - (c) Write short note on component testing. 5
 - (d) Explain the CMMI process improvement framework. 5
7. Answer any three of the following :—
 - (a) Explain the services as a reusable component. 5
 - (b) Define Verification and Validation. Explain software inspection in V & V process. 5
 - (c) Write short note on project scheduling. 5
 - (d) Draw a chart to explain ISO 9000 quality management. 5

[TURN OVER

- N.B. :** (1) There are 8 questions in this paper.
 (2) All questions are compulsory.
 (3) Each question carries 10 marks.
 (4) Internal choices are there in each question.
 (5) Figures to the right indicate full marks.

1. Attempt any two :—
 - (a) Define software engineering. Explain the software development life cycle steps in brief. 5
 - (b) What is the attribute of good quality software ? 5
 - (c) Write a note on Quality Control. 5
2. Attempt any two :—
 - (a) Explain the classification of the software requirements. 5
 - (b) Explain different types of Critical System. 5
 - (c) What is the meaning of Risk Management ? 5
3. Attempt any two :—
 - (a) Explain functional and non-functional requirements. 5
 - (b) Explain SRS in brief. 5
 - (c) What is the need of feasibility study in software development ? 5
4. Attempt any two :—
 - (a) Write a short note on modular decomposition styles. 5
 - (b) Explain user interface design process with the help of diagram. 5
 - (c) Write short note on project scheduling. 5
5. Attempt any two :—
 - (a) What is quality assurance ? What are the quality standards types ? 5
 - (b) Define Verification and Validation. Explain software inspection in V & V process. 5
 - (c) Explain the concept of Inheritance in short. 5
6. Attempt any two :—
 - (a) Write the features of UML. 5
 - (b) Write short note on component testing. 5
 - (c) Explain COCOMO Model in brief. 5
7. Attempt any two :—
 - (a) Explain Product Metrics. 5
 - (b) Describe the classification of process. 5
 - (c) Explain the CMMI process improvement framework. 5
8. Attempt any two :—
 - (a) Explain the services as a reusable component. 5
 - (b) Explain process and product quality. 5
 - (c) Draw a chart to explain ISO 9000-quality management. 5

Multimedia

P4-Exam.-2018-1-56

Con. 388-18.

GP-6155

(3 Hours)

[Total Marks : 100

N.B.: All questions are compulsory.

- Q.1. Attempt the following questions :
- A] Explain basic hardware & software requirement of multimedia? 5
 - B] Explain what is compression? Explain any one technique of compression? 5
- Q.2 Answer the following (Any Three) :
- A] What is multimedia? Explain application of multimedia? 5
 - B] Explain the scope of multimedia? 5
 - C] Explain digital representation? 5
 - D] What is multimedia database? Give the list of advantage? 5
- Q.3 Answer the following (Any Three) :
- A] What is wave? Explain the properties of wave? 5
 - B] What is image? Explain its various types of images? 5
 - C] What is fonts? Explain different type of fonts? 5
 - D] Describe CMYK color model? 5
- Q.4 Answer the following (Any Three) :
- A] What is raster scanning? Explain in brief? 5
 - B] Explain PDP? 5
 - C] Explain advantage of LCD? 5
 - D] Explain various file formats? 5
- Q.5 Answer the following (Any Three) :
- A] Explain Huffman algorithm? 5
 - B] Why is the need of compression? 5
 - C] Explain zip coding? 5
 - D] Explain lossy & lossless compression? 5
- Q.6 Answer the following (Any Three) :
- A] Explain multimedia production stage? 5
 - B] What is multimedia authoring? Explain? 5
 - C] What are the various tools to design multimedia? 5
 - D] What is Barriers to wide spread use? 5
- Q.7 Answer the following (Any Three) :
- A] Explain what are the issues of multimedia authoring? 5
 - B] Explain about flash in details? 5
 - C] Explain asymptotic notations? 5
 - D] Give the advantage and disadvantage of Dreamweaver? 5

- N.B.:** (1) Each question carries 05 marks.
(2) Attempt any two questions.

- Q.1. Answer the following (Any Two) :
- A] What is multimedia? Explain the scope of multimedia? 5
 - B] Write various application of multimedia? 5
 - C] Explain multimedia database? 5
- Q.2. Answer the following (Any Two) :
- A] What is wave? Explain Analog representation? 5
 - B] Explain Analog to Digital conversion? 5
 - C] Explain pulse modulation? Write importance & drawback of digital representation? 5
- Q.3. Answer the following (Any Two) :
- A] What is file? Explain its various type? 5
 - B] Explain principal of scanner & digital camera? 5
 - C] What is compression explain its types ? 5
- Q.4. Answer the following (Any Two) :
- A] Explain Quantization error? 5
 - B] What is gamma correction? 5
 - C] Explain various operations of files? 5
- Q.5. Answer the following (Any Two) :
- A] What is raster scanning principal? 5
 - B] Explain the fundamental characteristics of sound? 5
 - C] What is plasma display panel? 5
- Q.6. Answer the following (Any Two) :
- A] What is compression? Explain basic compression techniques-run length? 5
 - B] Explain Huffman coding? 5
 - C] Explain zip coding? 5
- Q.7. Answer the following (Any Two) :
- A] What is multimedia presentation, Write its various steps? 5
 - B] What is multimedia authoring metaphor? Explain in brief. 5
 - C] Explain about flash & dreamweaver? 5
- Q.8. Answer the following (Any Two) :
- A] Explain about LCD? 5
 - B] Explain video compression? 5
 - C] What is design how it is used in multimedia? 5

Java & Data Structure

Con. 389-18.

(3 Hours)

GP-6187

[Total Marks : 100

N.B. : All questions are compulsory.

1. Attempt both the questions :—
 - (a) Explain the Features of Java language. 5
 - (b) Write a short note on the concept of packages in java. 5
2. Attempt any three :—
 - (a) Write a short note on JVM. 5
 - (b) Explain the concept of Arrays in java language. 5
 - (c) Write a short note on type-casting in java. 5
 - (d) Write a java program to find the area of a rectangle and a circle using the concept of method overloading. 5
3. Attempt any three :—
 - (a) List and explain different types of Inheritance in Java. 5
 - (b) Explain different methods of Exception Handling. 5
 - (c) What are the two ways of creating thread in java ? Explain the concept with examples. 5
 - (d) Write a java program to find the reverse of a string, hence find it is palindrome or not ? 5
4. Attempt any three :—
 - (a) Explain the concept of File and Directories in java. 5
 - (b) Explain the methods of FileInputStream and FileOutputStream. 5
 - (c) Write a java program to store the content of a java object into a file using PrintWriter. 5
 - (d) Explain the concept of RandomAccessFile. 5
5. Attempt any three :—
 - (a) List and explain various asymptotic notations used in algorithm analysis. 5
 - (b) Define Arrays ? Describe the Properties of Arrays. 5
 - (c) Write an algorithm for Circular Queue-insertion and deletion operation. 5
 - (d) Explain the concept of binary search algorithm. 5
6. Attempt any three :—
 - (a) Write an algorithm for traversing a Linked List. 5
 - (b) Explain various collision resolution techniques. 5
 - (c) Write a short note on AVL trees. 5
 - (d) Describe the different methods of traversing a binary tree. 5
7. Attempt any three :—
 - (a) Write an algorithm for insertion and deletion of elements into a max heap. 5
 - (b) Write an algorithm for radix sort. 5
 - (c) Describe the different methods of representing a Graph structure. 5
 - (d) Write a short note on path matrix of a Graph. 5

[TURN OVER

N.B. : All questions are compulsory.

1. Attempt any two :—
 - (a) Write a short note on JVM. 5
 - (b) Explain the concept of Arrays in java language. 5
 - (c) Write a short note on type-casting in java. 5
2. Attempt any two :—
 - (a) List and explain different types of Inheritance in java. 5
 - (b) Explain different methods of Exception Handling. 5
 - (c) What are the two ways of creating thread in java ? Explain the concept with examples. 5
3. Attempt any two :—
 - (a) Explain the concept of File and Directories in java. 5
 - (b) Explain the methods of FileInputStream and FileOutputStream. 5
 - (c) Write a java program to store the content of a java object into a file using Print Writer. 5
4. Attempt any two :—
 - (a) Write a java program to find the area of a rectangle and a circle using the concept of method overloading. 5
 - (b) Write a java program to find the reverse of a string, hence find it is palindrome or not ? 5
 - (c) Explain the concept of RandomAccessFile. 5
5. Attempt any two :—
 - (a) List and explain various asymptotic notations used in algorithm analysis. 5
 - (b) Define Arrays ? Describe the Properties of Arrays. 5
 - (c) Write an algorithm for Circular Queue-insertion and deletion operation. 5
6. Attempt any two :—
 - (a) Write an algorithm for traversing a Linked List. 5
 - (b) Explain various collision resolution techniques. 5
 - (c) Write a short note on AVL trees. 5
7. Attempt any two :—
 - (a) Write an algorithm for insertion and deletion of elements into a max heap. 5
 - (b) Write an algorithm for radix sort. 5
 - (c) Describe the different methods of representing a Graph structure. 5
8. Attempt any two :—
 - (a) Explain the concept of binary search algorithm. 5
 - (b) Describe the different methods of traversing a binary tree. 5
 - (c) Write a short note on path matrix of a Graph. 5

Quantitative Techniques

WA-JP-Exam.-1st Half-2018-116
Con. 390-18.

GP-6031

(3 Hours)

[Total Marks : 100

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

1. Attempt any one :-

- (a) Use Lagrange's interpolation formula to fit a polynomial to the following data 10
and hence find y at 4.

x	0	1	2	3
y	8	3	1	12

- (b) Two unbiased dice are thrown. Find the expectation and variance of sum of numbers 10
appearing on upper faces of the dice.

2. (a) By using Bisection method find root of the equation $\cos x - x = 0$ upto 8 iterations. 8

- (b) Find approximate value of $\sqrt{5}$ by using Newton-Raphson method correct up to 7
3 decimal places.

- (c) Evaluate $\int_0^6 \frac{1}{1+x} dx$ by Simpson's $\frac{3}{8}$ rule take $h = 1$. 7

3. (a) Solve the following equations by Gauss-Seidel method correct upto two decimal places. 8

$$13x - 2y + 3z = 70$$

$$2x + 12y + 8z = 35$$

$$x + 7y - 22z = 40$$

- (b) Evaluate $\int_0^3 e^x dx$ by Simpson's $\frac{1}{3}$ rd rule take $h = 0.5$ 7

- (c) By using R.K. Method of Fourth order to solve $\frac{dy}{dx} = x^2 + y^2$ given $y(1) = 1$ and 7
find $y(1.1)$ and $y(1.2)$.

4. (a) For a Random variable X the ratio of the probability of 3 successes in 5 independent 8

trials to the probability of 2 successes in 5 independent trials is $\frac{1}{4}$. Find the
 n , p and q for a random variable X and also find the probability of 5 successes in
6 independent trials.

- (b) The income distribution of workers in a certain factory was found to be normal 7
with mean of ₹ 500 and standard deviation equal to ₹ 50. There were 228 persons
above ₹ 600. How many persons were there in all? (Area under the S. N. curve
between 0 and 2 is 0.4772)

[TURNOVER

- (c) By using Poisson distribution find the probability that at most 10 defective items will be found in a lot of 500 items if it is known that 5% of the items are defective. 7

5. (a) Given $6y = 5x + 90$ and $15x = 8y + 130$ and $\sigma_x^2 = 16$ find (i) means of x and y 8

(ii) Coefficient of Correlation between x and y and also find y when $x = 5$.

- (b) Fit a straight line for the following data 7

x	1	2	3	4	5	6	7
y	7	9	11	12	13	14	12

- (c) Obtain the Rank Correlation coefficient from the following data. 7

x	10	12	18	18	15	40
y	12	18	25	25	50	25

6. (a) A coin is Tossed 400 times and was found to result in 'Head' 245 times. Can we conclude that the coin is fair? (At 5% l.o.s table value is 1.96) 8

- (b) Nine items of a sample had the following values 45, 47, 50, 52, 48, 47, 49, 53, 51. Does the mean of 9 items differ significantly from the assumed population mean 47.5? (At 5% l.o.s table value is 2.306). 7

- (c) Intelligence tests of two groups of boys and girls obtained from two normal populations gave the following results. 7

	Boys	Girls
Size of samples	8	7
Mean of samples	1134	1024
Standard Deviation	35	40

Test at 5% l.o.s whether the difference in the sample means is significant. (Table value of 't' for 13 d.o.f. is 2.16 for 14 d.o.f is 2.15 and for 15 d.o.f is 2.13)

7. (a) Solve the following L.P.P by Simplex Method. 8

Maximize $Z = 12x + y$

Subject to $x + y \leq 10$, $2x + 5y \leq 20$

$3x + 2y \leq 18$,

$x, y \geq 0$

- (b) Solve the following L.P.P by Graphical Method. 7

Maximize $Z = 14x + 10y$

Subject to $X + y \leq 3$, $2x + y \leq 2$

$x, y \geq 0$

- (c) A company manufactures two types of products X and Y and sells them at a profit of ₹ 4 on type X and ₹ 4 on type Y. Each product is processed on two machines G and H. Type X requires two minutes on G and three minutes on H, Type Y requires two minutes on G and two minutes on H. The machine G is available for not more than 10 hours and machine H is available for not more than 23 hours per day. Formulate the problem to maximize the profit. 7

Con. 390-18.

(3 Hours)

GP-6031

[Total Marks : 80]

- N.B. :** (1) All questions are compulsory.
 (2) Each question carries 10 marks.
 (3) Internal choices are there in each question.
 (4) Figures to the right indicate full marks.

1. Attempt any two :- 10

- (a) Find $\sqrt{8}$ by using Newton-Raphson method correct up to 3 decimal places. 5
 (b) Solve the following equations by Gauss-Seidel method correct up to three decimal places. 5
- $$\begin{aligned} 11x - y + 4z &= 6 \\ 2x - 14y + 10z &= 5 \\ x + y + 4z &= 20 \end{aligned}$$
- (c) Use Bisection method to find root of the equation $x^3 + 5x - 1 = 0$ upto 4 iterations. 5

2. Attempt any two :- 10

- (a) By using Δ and E find the missing term of the following table : 5

x	2	3	4	5	6
y	4	9	16	-	36

- (b) Evaluate $\int_0^6 \frac{1}{1+x} dx$ by Simpson's $\frac{3}{8}$ th rule take $h = 1$. 5
- (c) Use Euler's method to estimate $y(0.4)$ for $\frac{dy}{dx} = x^2 + y^2$, $y(0) = 1$ and $h = 0.2$ 5

3. Attempt any two :- 10

- (a) A continuous Random variable has the probability density function $f(x) = k(x - x^2)$, $0 \leq x \leq 1$ find k , mean. 5

[TURN OVER]

- (b) If the probability that an individual suffers a bad reaction from a particular injection is 0.002 by using Poisson distribution determine the probability that more than two individuals will suffer a bad reaction out of 1000. 5
- (c) If a fair coin is tossed 7 times find the probability of getting exactly three heads by binomial distribution. 5

4. Attempt any two :- 10

- (a) Use Lagrange's interpolation formula to find y at 1 for following data : 5

x	-1	0	2	3
y	-8	3	1	12

- (b) Chest measurement of 1200 soldiers was found to be normal with mean of 85 cms and standard deviation 5 cms. How many of them are expected to have their chest measurement exceeding 95 cms? (Area under the S. N. curve between 0 and 2 is 0.4772) 5

- (c) Evaluate $\int_0^3 e^x dx$ by Simposn's $\frac{1}{3}$ rd rule take h = 0.5 5

5. Attempt any two :- 10

- (a) The equations of the two regression lines are $3x + 2y = 26$ and $6x + y = 31$ find (i) means of x and y. (ii) Coefficient of Correlation between x and y. 5
- (b) Obtain the Rank Correlation coefficient from the following data : 5

x	18	20	34	52	12
y	39	23	35	18	46

- (c) Fit a straight line of the form $y = ax + b$ for the following data : 5

x	3	4	5	6	7
y	10	12	11	13	14

6. Attempt any two :- 10

- (a) A Coin is Tossed 250 times and was found to result in 'Head' 150 times. Can we conclude that the coin is fair? (At 5% l.o.s table value is 1.96). 5
- (b) Five items of a sample had the following values 7, 5, 4, 9, 3. Does the mean of these items differ significantly from the assumed population mean 3.5? (At 5% l.o.s table value is 2.306) 5
- (c) Can it be concluded that the life span of an Indian is more than 60 years, if a random sample of 100 Indians has an average life span of 62 years with Standard Deviation of 6.8 years? (At 5% l.o.s table value is 1.645) 5

7. Attempt any two :-

10

- (a) A dealer has two types of articles for sale. If he sells one piece of A, he earns ₹ 3 and if he sells one piece of B, he earns ₹ 5. By the contract with manufacturer of A he has to sell at least 7 articles. Manufacturers can supply him 15 pieces of A and 12 pieces of B. If he can at the most sell 14 pieces, in all, formulate the above problem.

5

- (b) Solve the following L.P.P by Graphical Method.

5

$$\text{Minimize } Z = 15x + 10y$$

$$\text{Subject to } x + 2y \geq 2,$$

$$3x + y \geq 3,$$

$$3x + 2y \leq 6$$

$$x, y \geq 0$$

- (c) Solve the following L.P.P by Simplex Method.

5

$$\text{Maximize } Z = x + y + 4z$$

$$\text{Subject to } x + y \leq 4, 2y + 5z \leq 10$$

$$3x + 2y + 4z \leq 15$$

$$x, y, z \geq 0$$

8. Attempt any two :-

10

- (a) Given $6y = 5x + 90$ and $15x = 8y + 130$ and $\sigma_x^2 = 25$

5

Find Coefficient of Correlation between x and y and also find y when x = 4.

- (b) Samples of electric tubes of two companies were tested for lengths of their life and following information was obtained

5

	Company A	Company B
Size of Samples	8	7
Mean life	1210	1314
Standard Deviation	36	42

Test at 5% l.o.s whether the difference in the sample means is significant. (Table value of 't' for 13 d.o.f is 2.16, for 14 d.o.f is 2.15 and for 15 d.o.f is 2.13)

- (c) Solve the following L.P.P Simplex Method.

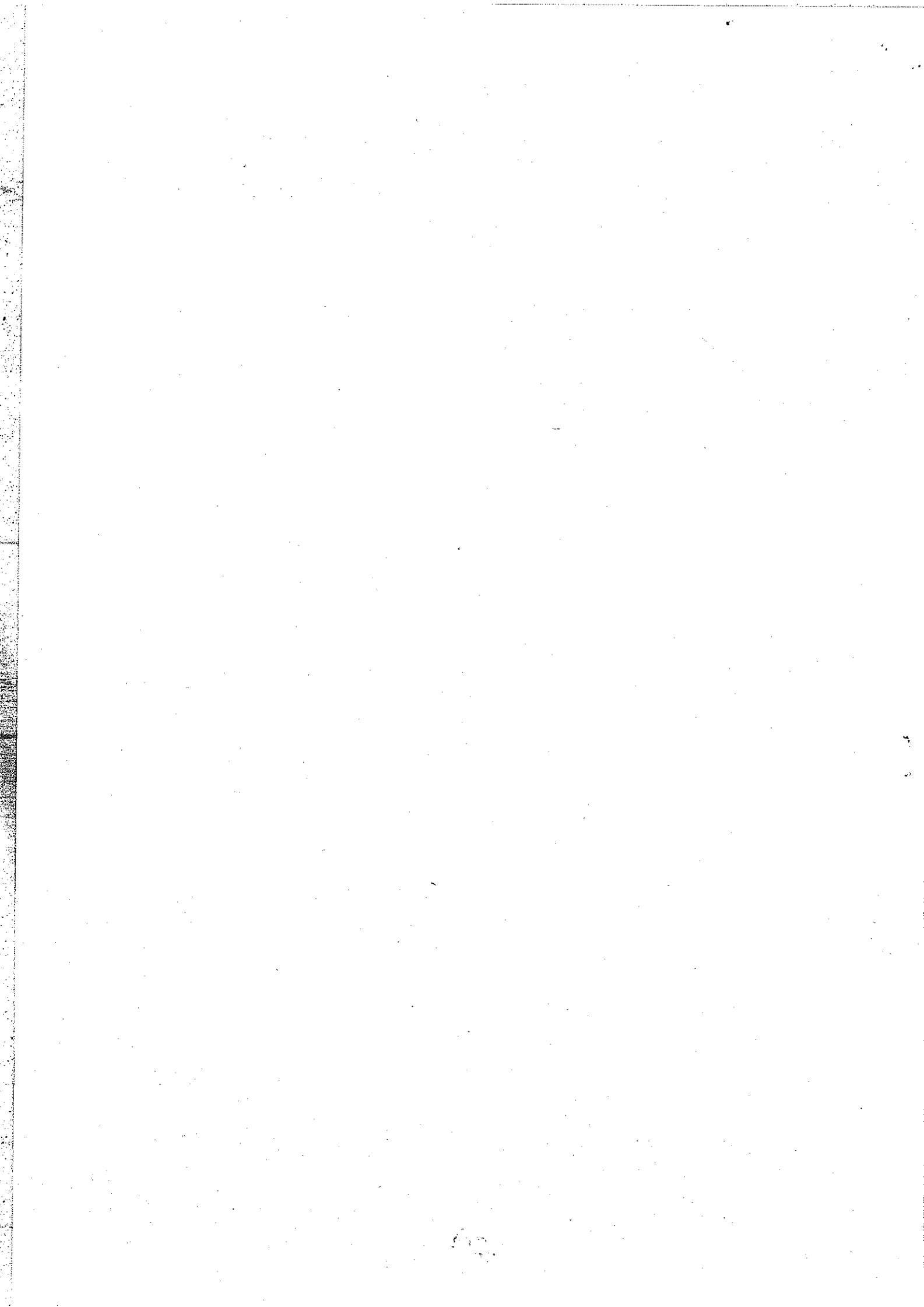
5

$$\text{Maximize } Z = 10x + 20y$$

$$\text{Subject to } x + y \leq 4,$$

$$2x + 5y \leq 10$$

$$x, y \geq 0$$



Embedded Systems

P4-Exam.-2018-1-58
Con. 391-18.

GP-6036

(3 Hours)

[Total Marks : 100

- N.B.: (1) All question are compulsory.
(2) Figures to the right indicate full marks.

- Q.1. Attempt the following questions :
a) Distinguish between microprocessor and microcontroller. 5
b) What is importance of "infinite loop" in embedded systems? Explain with an example. 5
- Q.2. Attempt any three questions from the following :
a) Differentiate between Harvard and Von-Neumann architecture. 5
b) What is UART in embedded system? 5
c) Write a short note on PLDs in embedded systems. 5
d) Explain classification of embedded systems on the basis of generation. 5
- Q.3. Attempt any three questions from the following :
a) Draw and explain product life cycle graph. 5
b) Explain following automotive communication buses :- 5
(i) CAN (ii) LIN
c) Explain any three characteristics of embedded system in detail. 5
d) Explain following operational quality attributes of embedded system :- 5
(i) Response (ii) Reliability
- Q.4. Attempt any three questions from the following :
a) Explain build process in embedded system with diagram. 5
b) Write short note on remote debugger. 5
c) Explain linking process in embedded system. 5
d) Explain following terms :- 5
(i) Cross compiler (ii) Device programmer
- Q.5. Attempt any three questions from the following :
a) What do you mean by memory testing? Explain address bus test in detail. 5
b) Differentiate between SRAM and DRAM. 5
c) Write short note on direct memory access. 5
d) Write short note on checksum method in embedded systems 5
- Q.6. Attempt any three questions from the following :
a) Explain following scheduling algorithms - 5
(i) first in first out (ii) Round robin
b) Write a short note on device driver. 5
c) Write short note on watchdog timer. 5
d) What is task? Explain task states in embedded system programming. 5
- Q.7. Attempt any three questions from the following :
a) Explain the limitations of simulator based debugging 5
b) Write short note on Disassembler/Decompiler. 5
c) Explain need and Requirement phases of EDLC. 5
d) What are the objectives of EDLC ? 5

[TURN OVER

- N.B.:** (1) All question are **compulsory**.
 (2) **Figures to the right** indicate **full marks**.
- Q.1 Attempt any **two** questions from the following :
- Differentiate between RISC and CISC. 5
 - Explain classification of embedded systems on the basis of complexity & performance. 5
 - Write a short note on watchdog timer. 5
- Q.2 Attempt any **two** questions from the following :
- Explain following characteristics of embedded system in detail :- 5
 - Application and domain specific
 - Reactive and real-time
 - Explain following operational quality attributes of embedded system :- 5
 - Reliability
 - Security
 - Explain following non-operational quality attributes of embedded system 5
 - Testability and debug-ability
 - Per unit cost and revenue
- Q.3 Attempt any **two** questions from the following :
- Explain role of infinite loop in embedded system with example. 5
 - Explain compiling process in embedded system. 5
 - Write short note on host and target platform in embedded system. 5
- Q.4 Attempt any **two** questions from the following :
- Explain function of washing machine as an application specific embedded system. 5
 - Draw and explain product life cycle graph. 5
 - Explain I2C bus in embedded systems. 5
- Q.5 Attempt any two questions from the following :
- What do you mean by memory testing? Explain data bus test in detail. 5
 - Write short note on CRC. 5
 - Explain following types of ROM :- 5
 - Masked ROM
 - PROM
 - EPROM
- Q.6 Attempt any **two** questions from the following :
- Enlist steps for implementation of device driver. 5
 - Explain real-time characteristics of embedded operating system. 5
 - Explain the function of control and status register in embedded system. 5
- Q.7 Attempt any **two** questions from the following :-
- Explain design phase of EDLC. 5
 - What do you mean by Simulator? 5
 - Explain advantages of simulator based debugging. 5
- Q.8 Attempt any **two** questions from the following :-
- Write short note on Disassembler/Decompiler. 5
 - Explain following scheduling algorithms. 5
 - first in first out
 - priority based
 - Write short note on Flash memory. 5

(Nov-18)
 S.V.B.Sc (I.T.) Sem-IV