

Course Code: CSE410

Full Marks: 60

N.B.

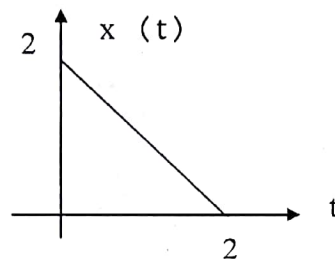
Course Title: Digital Signal Processing

Time: 3 hours

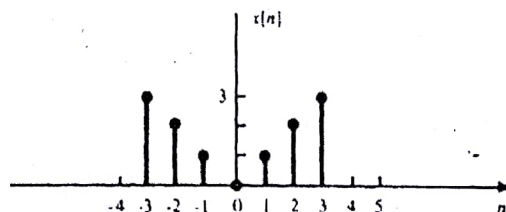
- i) Answer **SIX** questions, taking any **THREE** from each section.
- ii) All questions are of equal values.
- iii) Use separate answer script for each section.

SECTION-A (30 Marks)

- Q.1 (a) State the definition of signal, noise, sampling, quantization and coding. 5
- (b) What is periodic time signal? Prove that the cosine signal is periodic with periodicity T . 3
- (c) The signal $x(n) = (-0.5)^n u(n)$ is an energy signal. Justify it. 2
- Q.2 (a) What is meant by a system? When a system is said to be stable? What are the differences exist between linear and non-linear systems? 4
- (b) Check whether the following systems are causal or not. 4
- i. $y(t) = tx(t)$
 - ii. $y(t) = \frac{dx(t)}{dt}$
- (c) Draw the odd and even representations for the given signal. 2



- Q.3 (a) Prove that the product of two even signals or two odd signals is an even signal and that the product of an even signal and an odd signal is an odd signal. 2.5
- (b) Find the odd and even components of the following signal: 3.5
- I. $x(t) = e^{j2t}$
 - II. $x(t) = \cos t + \sin t$
- (c) Define unit step function, unit impulse, Gaussian and sinusoidal functions. 4
- Q.4 (a) Find $(2n+3)$ for the given signal $x[n]$. 3



- (b) Derive an expression for convolution sum. 3
- (c) Perform convolution for the given data sets graphically. 4
- $x(n) = \{2, 4, 6, 8\}$ and $h(n) = \{1, 3, 5, 7\}$

SECTION-B (30 Marks)

- Q.5 (a) What is meant by Fourier representation? Determine the periodic signal whose fundamental frequency is 3π and Fourier coefficients are $a_0=1$, $a_{-1}=a_1 = \frac{1}{4}$, $a_{-3} = a_3 = \frac{1}{6}$, $a_{-5}=a_5 = \frac{1}{8}$, $a_{-7} = a_7 = \frac{1}{11}$ 4

(b) Briefly explain the concept of Dirichlet condition and Gibb's phenomenon. 4

(c) List the properties of DTFS. 2

- Q.6 (a) Derive the expression of continuous-time Fourier transform. What is meant by magnitude spectrum and phase spectrum? 5

(b) Determine the 4-point DFT and IDFT of the given signal. 3

$$x(n) = \begin{cases} 1, & 0 \leq n \leq 3 \\ 0, & \text{elsewhere} \end{cases}$$

(c) What is meant by circular convolution and section convolution? 2

- Q.7 (a) Write down all steps of RADIX-2 fast Fourier transform (FFT) algorithm. 2

(b) What are the differences exist among FIR filter and IIR filter? 2

(c) Obtain the direct form structure realization of the non-recursive system. 2

$$H(Z) = 1 + \frac{1}{2} Z^{-1} + \frac{1}{3} Z^{-2} + \frac{1}{4} Z^{-3} + \frac{1}{5} Z^{-4} - \frac{1}{6} Z^{-5}$$

(d) Write down the definition of low pass filter, high pass filter, band pass filter and band stop filter. 4

- Q.8 (a) Find the Z-transform and mention the region of convergence (ROC) for the following discrete time sequences. 4

I. $X(n) = \{2, 1, 2, 3\}$
 \uparrow

II. $X(n) = \{2, 1, 2, 3\}$
 \uparrow

III. $X(n) = \{1, 2, 1, -2, 3, 1\}$
 \uparrow

(b) What is Z-transform? Write down the reasons for using Z-transform. 2

(c) Find the inverse Z-transform of the given function, 4

$$X(Z) = \frac{1}{1 - 1.5Z^{-1} + 0.5Z^{-2}}$$

Using power series expansion method, for

i. $ROC, |Z| > 1$

ii. $ROC, |Z| < 1$

Bangabandhu Sheikh Mujibur Rahman Science and Technology University

Department of Computer Science & Engineering

4th Year 1st Semester B.Sc. Engineering Examination-2018

Course Title: Web Engineering
Full Marks: 60

Course Code: CSE 430
Time: 3(Three) Hours

N.B.

- i) Answer **SIX** questions, taking any **THREE** from each section.
- ii) All questions are of equal values.
- iii) Use separate answer script for each section.

SECTION-A

- Q.1 (a)** Define Web Engineering. Explain characteristics of web Engineering. 2
- (b)** Computer-shop management System is a project which assist in keeping the Record of whatever the sales from shop (whole seller), also it keep track of remaining balance which due after selling the product. Through this project we maintain the warranty given on particular products along with complete information related to that product. We have to build a software for store billing management. Sell hardware systems components and accessories (keep track of sold configuration, create system configuration, sell accessories and computer components, supplying company's administration) 8

Now you have to design use case diagram, logical and physical design paradigm for the system.

- Q.2 (a)** What are some of the unique features of e-commerce technology? 2
- (b)** Internet banking system is specially developed for online banking for Opening Single/Multiple Account, Balance Enquiry, Funds Transfer to another account in the same bank /different bank Request for cheque book/change of address/stop payment of cheques, mini statements based on monthly and annual statements. 8

Draw and explain the planning, design and developing phase while developing the above Banking System.

- Q.3 (a)** What is a business model? How does it differ from a business plan? 2
- (b)** What do you mean by protocol? Give the name of these protocols which help in World Wide Web and explain working of those protocols. 4
- (c)** Define the systems development life cycle and discuss the various steps involved in creating an e-commerce site. 4

- Q.4 (a)** Discuss the differences between a simple logical and a simple physical website design. 2
- (b)** List various tags in HTML with simple example for a web page. Explain how forms are constructed in HTML document. 4
- (c)** Discuss about the following HTML file paths 4
- I. ``
 - II. ``
 - III. ``
 - IV. ``

SECTION-B

- Q.5** (a) "Maintenance of a Software never ends. It is also true for Web Application"- Justify your opinion for the statement. 2
(b) Write a sample javaScript code when you click on an image it turns into another image. 4
(c) What do you mean by CSS? What are the ways of creating style sheets? 4
- Q.6** (a) What do you mean by Ajax? What are the advantages of Ajax? Give an example of simple Ajax. 2
(b) Write the HTML and CSS code for the following form: 4

Name:

E-mail:

Message:

- (c) What do you mean by session and cookies? What are the advantages and limitation of session and cookies? Give example of session and cookies in web document. 4
- Q.7** (a) Write down the challenges of E-Commerce. 2
(b) Explain CSS Box Model. 3
(c) Create the following horizontal menu using proper HTML and CSS codes. 5



- Q.8** (a) We want to develop a system for a University. The University contains many Faculties. The Faculties in turn are divided into several Schools. Each School offers numerous programs and each program contains many courses. Lecturers can teach many different courses and even the same course numerous times. Courses can also be taught by many lecturers. A student is enrolled in only one program but a program can contain many students. Students can be enrolled in many courses at the same time and the courses have many students enrolled. 7
- Now deduce the functional design for the University.
- (b) How to connect a MySQL database with PHP on a HTML page? Write down the required steps with PHP codes. 3

Bangabandhu Sheikh Mujibur Rahman Science and Technology University

Department of Computer Science and Engineering

4th Year 1st Semester Final B.Sc. Engineering Examination-2018

Course Code: CSE400

Course Title: Parallel Processing and Distributed System

Total Marks: 60

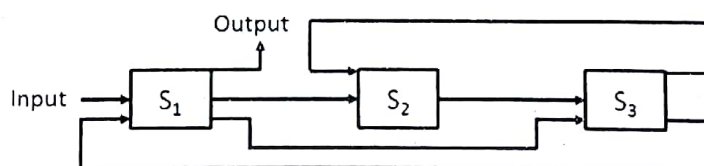
Time: 3 (Three) Hours

N.B.

- i. Answer **SIX** questions taking any **THREE** from each section.
- ii. All questions are of equal values.
- iii. Use separate answer script for each section.

Section: A

1. a) What are the characteristics of parallel processing? Why do we need it? 4
b) Write short note about Message Passing programming model. Explain the purpose of synchronization between sender and receiver for avoid deadlock situation in MPI. 4
c) Describe MISD architecture with examples. 2
2. a) Explain parallel processing with example. Define: Throughput of parallel processing. 3
b) Consider the expression $(A_i * B_i + C_i)$ for $i = 1, 2, 3, \dots, 7$. Draw the flowchart and execution table of expression using pipeline processing. 3
c) Write down the differences between SISD and MIMD computer system. 2
d) Consider 200 tasks to be executed for 6-stages pipeline and 5 tasks to be executed for non-pipelined system. Find out the value of speedup using both systems. 2
3. a) What is PRAM model? Explain with its classifications. 5
b) Prove that a k-stage linear pipeline can be at most k times faster than that of a non-pipelined serial processor. 3
c) Write down the reservation table for the pipeline with eight columns and three rows. 2



4. a) What are the steps of creating a parallel program? Explain. 2.5
b) Explain Master-slave model and pipeline model with example. What are the precautions in using the Master-slave model? 2.5
c) Design the pipelined multiplication of two 6-bit fixed point numbers 5

Section: B

5. a) Suppose two different threads are running on shared variable parallel processing passion. 4
Analyze the given threads and note what could go wrong? Find out the solution for parallel processing?

Thread 1

Shared A
Shared A[1...2]
Private i

A[1]:=0
For i:=1...N/2
A[1]:=A[1]+f(a[i])
A:=A[1]+A[2]

Thread 1

Shared A
Shared A[1...2]
Private i

A[2]:=0
For i=N/2+1....N
A[2]=A[2]+f(a[i])

- b) What is the difference between NUMA and UMA with its programming and machine 3
model?
- c) Why code optimization is important in parallel processing? Write two code optimization 3
techniques with example.
6. a) Describe the architecture of 'Grid Computing System' with diagram. 4
b) What do you understand by 'Middleware'? 3
c) Write down the differences between latency and bandwidth. 3
7. a) Explain what problems can happen if there is no concurrency control where multiple 3
transactions are being executed at the same time..
- b) What is the two-phase commit algorithm and explain in details? Why the two-phase 4
commit algorithm is used in distributed transactions?
- c) Describe briefly about different types of security attack. 3
8. a) Is a distributed algorithm is more fault tolerant than a centralized algorithms? Prove your 3
answer with example.
- b) Explain data consistency of distributed system. Write short note on COMMIT and 3
ROLLBACK protocol.
- c) What are the requirements of mutual exclusion? Also describe the Ricart and Agrawala's 4
Algorithm and find out the Message complexity, Client delay and Synchronization delay.