

4. Differentiate between lexical analysis and syntax analysis  
 Roll No. ....  
 10 Marks (CO1)

$T \rightarrow \text{int} \mid \text{float}$  OR

## TCS-601

### B. TECH. (SIXTH SEMESTER)

### MID SEMESTER EXAMINATION, April/May, 2022

#### COMPILER DESIGN

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any **one** of the sub-questions.  
 (ii) Each sub-question carries 10 marks.

1. (a) Discuss in detail about the operations of compiler which transforms the source program from one representation into another. Illustrate the output for the input : 10 Marks (CO1)

$$A = B * C + 2$$

OR

- (b) Identify whether the following grammars are suitable for Top-Down parsing. If not, apply appropriate technique to make it suitable for Top-Down parsing. 10 Marks (CO1)

$$(i) A \rightarrow ABd \mid Aa \mid a$$

$$B \rightarrow Be \mid b$$

$$(ii) A \rightarrow Cd$$

$$B \rightarrow Ce$$

$$C \rightarrow A \mid B \mid f$$

$$(iii) S \rightarrow aSSbS \mid aSaSb \mid abb \mid b$$

2. (a) Why two-buffer scheme is used in lexical analysis ? Elaborate input buffering strategy, used in lexical analysis phase. 10 Marks (CO1)

OR

- (b) List the cousins of compiler and discuss the role of them.

10 Marks (CO1)

3. (a) Define Top-Down parsing and what are the key problems with Top-Down parse. 10 Marks (CO2)

For the given Grammar G1

$$E \rightarrow E + T \mid T$$

$$T \rightarrow T * F \mid F$$

$$F \rightarrow (E) \mid id$$

- (i) Rewrite the grammar G1 suitable for Top-Down parsing and label it as G2.

- (ii) Parse the input string  $id + id * id$  using Recursive descent parsing technique.

OR

- (b) Consider the Grammar G1

$$S \rightarrow a \mid b \mid (L)$$

$$L \rightarrow L, S \mid S$$

- (i) Do the necessary changes to make it suitable for LL(1) parser and label it as G2.
- (ii) Construct First and Follow sets for the grammar G2.

10 Marks (CO2)

(3)

4. (a) Consider the following grammar : Roll No. .... 10 Marks (CO2)

$S \rightarrow TL;$

$T \rightarrow \text{int} \mid \text{float}$

$L \rightarrow L, id \mid id$

Apply shift reduce parser to parse the input int id, id;

OR

- (b) Elaborate the working of shift-reduce parser and discuss the conflicts that may occur during the shift-reduce parser with examples.

Maximum Marks : 50

10 Marks (CO2)

5. (a) Design SLR parser for the following grammar by computing LR(0) items and show the parsing of strings ((a)) : 10 Marks (CO2)

$A \rightarrow (A) \mid a$

OR

- (b) Show that the following grammar is LR(1) but not LALR :

10 Marks (CO2)

$S \rightarrow Aa \mid bAC \mid BC \mid bBa$

$A \rightarrow d$

$B \rightarrow d$

TCS-601

1000

P.T.O.

5. (a) Write a short note on Object Oriented Design & Explain with an example.  
**Roll No. ....**  
**10 Marks (CO2/CO3)**

**TCS-602**

OR

**B. TECH. (SIXTH SEMESTER)****MID SEMESTER EXAMINATION, April/May, 2022****SOFTWARE ENGINEERING****Time : 1½ Hours****Maximum Marks : 50**

**Note :** (i) Answer all the questions by choosing any **one** of the sub-questions.

(ii) Each question carries 10 marks.

1. (a) State **four** factors that have contributed to the making of the present software crisis and suggest **two** possible solutions. **10 Marks (CO1/CO3)**

OR

- (b) For an “ABC” project the project manager is supposed to choose one model for its implementation. The project is high in budget and ready to spent on powerful development tools and techniques. The manager is looking for a modular approach so that delivery of project can be done in 80 days. All the resources are skilled and there is no technical risk involved in completion of project. Analyse and suggest the model to be adapted for “ABC” project by the project manager with reasons.

**10 Marks (CO1/CO3)****P. T. O.**

2. (a) What is Software Development Life Cycle ? Elaborate each phase.

10 Marks (CO1/CO2)

OR

(b) Explain the manifesto and principle used in agile approach. Explain Scrum approach for agile. 10 Marks (CO1/CO2)

3. (a) Differentiate between the following : 10 Marks (CO1/CO2)

(i) Functional and structural testing

(ii) Cohesion and Coupling

OR

(b) Discuss the standard format of Software Requirement Specification (SRS). What is the role of modelling in developing an SRS ?

10 Marks (CO1/CO2)

4. (a) Consider a Library Management System : 10 Marks (CO2/CO3)

(i) Who are the stakeholders for this system ?

(ii) Identify user and system requirements for generating a monthly report for the stock of books.

OR

(b) Discuss the following architectural patterns : 10 Marks (CO2/CO3)

(i) Client and Server Architecture

(ii) Repository Architecture

(3)

5. (a) What is the difference between decision table and decision tree ?  
Explain with an example.

10 Marks (CO2/CO3)

OR

- (b) Consider the problem of railway reservation system and design the following :

10 Marks (CO2/CO3)

(i) Data flow diagram

(ii) Use case diagram

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any *one* of the sub-questions.

(ii) Each question carries 10 marks.

1. (a) State four reasons that have contributed to the making of the present software crisis and suggest two possible solutions. 10 Marks (CO1/CO3)

OR

- (b) For an IS project the project manager is supposed to choose one model for its development. The project is high in budget and ready to spend on powerful development tools and technologies. The manager is looking for a better approach so that delivery of project can be done in 80 days. The resources are skilled and there is no technical risk involved in execution of project. Analyse and suggest the model to be adopted for development by the project manager with reasons.

600

10 Marks (CO1/CO3)

P.T.O.

TCS-602

**Roll No. ....**

**TCS-604**

## **B. TECH. (CSE) (SIXTH SEMESTER)**

**MID SEMESTER EXAMINATION, April/May, 2022**

## **COMPUTER NETWORKS-I**

**Time : 1½ Hours**

**Maximum Marks : 50**

**Note :** (i) Answer all the questions by choosing any *one* of the sub-questions.

(ii) Each question carries 10 marks.

1. (a) How would you calculate the end to end delay in a network of 10 Mbps transmission rate links with two store and forward switches in the path and a packet size of 2500 bits. Assume that each link introduces a propagation delay of 20 micro second and that the switch begins retransmitting immediately after it has finished receiving the packet, data size 200000 bits with message segmentation. 10 Marks (CO3)

OR

- (b) Explain the use of If-modified-since header in HTTP. 10 Marks (CO2)

2. (a) How cookies are managed by the client and server ? Discuss the advantages and disadvantages of using cookies. 10 Marks (CO2)

OR

- (b) How is propagation delay affected if the length of the packet is increased ? 10 Marks (CO2)
3. (a) During the process of electronic mail transfer write all the commands which are used to transfer the mail from SMTP client to SMTP server. 10 Marks (CO2)

OR

- (b) Consider sending voice from Host A to Host B over a packet switched network. Host A converts on-the-fly analog voice to a digital 64-Kbps bit stream. Host A then groups the bits into 48-byte packets. There are two links between host A and B, transmission rate of both the links is 1 Mbps and end to end propagation delay is 2 ms. As soon as Host A gathers a packet, it sends it to Host B. As soon as Host B receives an entire packet, it converts the packet's bits to an analog signal. How much time elapses from the time a bit is created (from the original analog signal at A) until a bit is decoded. 10 Marks (CO3)
4. (a) Explain *one* of the applications which uses peer to peer application architecture. 10 Marks (CO2)
- (b) Consider an HTTP client that wants to retrieve a Web document at a given URL. The IP address of the HTTP server is initially unknown. What transport and application-layer protocols besides HTTP are needed in this scenario ? What messages client will send and to whom to get P address of the server ? What messages are exchanged between client and server to finally get the Web document ? Explain briefly with suitable example. 10 Marks (CO3)

(3)

5. (a) Assume a 20 meter link, over which a sender can transmit at a rate of 150 bits/sec in both directions. Suppose that packet containing data are 100000 bits long and packet containing only control (eg. ACK or hand-shaking) are 400 bits long. Assume that N parallel connections each get  $1/N$  of the link bandwidth. Now consider the HTTP and suppose that each downloaded object is 200 Kbits long and that the initial downloaded objects contain 10 referenced objects from the same sender. Would parallel download via parallel instances of non-persistent HTTP make sense in this case ? Now consider persistent HTTP. Do you expect significant gains over the non-persistent case ? Justify and explain your answer.

10 Marks (CO3)

Note : (a) Non-parallel connections OR using one of the sub questions

- (b) How would you describe the process of resolving IP for a host name using recursive DNS query and iterative DNS query messages ?

10 Marks (CO2)

1. (a) Explain the use w/ If-modified-since header in HTTP. 10 Marks (CO2)

2. (a) How cookies are managed by the client and server ? Discuss the

TCS-604

1000

R.T.O.

(1)

Roll No. ....

With a suitable example. Draw its significance of a measure learning model.

10 Marks (CO2)

## TCS-632

OR

### B. TECH. (SIXTH SEMESTER) MID SEMESTER EXAMINATION, April/May, 2022

ARTIFICIAL INTELLIGENCE

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any *one* of the sub-questions.

(ii) Each sub-question carries 10 marks.

1. (a) What is the difference between heuristic algorithms and solution-based algorithms ? 10 Marks (CO1)

OR

- (b) What is the difference between hard and soft AI products ? Explain with SIRI as a use case. 10 Marks (CO2)

2. (a) Describe in detail with example: 10 Marks (CO1)

- (i) Structured data  
(ii) Unstructured data and  
(iii) Semi-structured data

OR

- (b) What is the difference between predictive and descriptive analysis ?

How does prescriptive analysis come into the existence with these two analyses ? 10 Marks (CO3)

P. T. O.

(2)

3. (a) What is the difference between regression and classification ? Explain it with a suitable example. Draw an architecture of a machine learning model.

10 Marks (CO2)

OR

- (b) What are the different characteristics of Fillmore Case Grammar ? Also differentiate between Deep structure vs. Surface structure.

10 Marks (CO3)

4. (a) Explain natural language understanding. Also explain the components and steps of natural language processing.

10 Marks (CO1)

OR

- (b) What is Turing Test approach in artificial intelligence ? What are the different cognitive tasks included in cognitive modeling while making AI products ?

10 Marks (CO3)

OR

5. (a) What is Rational agent in artificial intelligence ? How you will define it mathematically ?

10 Marks (CO3)

OR

- (b) Discuss the difference between Context free Grammar and Fillmore Case Grammar with examples.

10 Marks (CO2)

OR

- (d) What is the difference between predicate and descriptive syntax ?  
How does descriptive syntax come into the existence with these two

TCS-632 M01

1000

Roll No. ....

IT

TCS-691

B. TECH. (SIXTH SEMESTER)

MID SEMESTER EXAMINATION, April/May, 2022

IMAGE PROCESSING AND COMPUTER VISION

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any *one* of the sub-questions.  
(ii) Each question carries 10 marks.

1. (a) Why do we need computer vision ? How one can differentiate between image processing and computer vision ? Write *one* example to show the utilization of image processing in computer vision applications.

10 Marks (CO1)

OR

- (b) How is binary image different from grayscale image ? Write MATLAB code and show all steps and process of gray image to binary image conversion by taking an example of  $5 \times 5$  image matrix.

10 Marks (CO1)

2. (a) Explain how the Log Transformation and Power-Law Transformation are used to enhance the images. Write a MATLAB code for Log Transformation and Power-Law Transformation for increasing the darkness of an image.

10 Marks (CO2)

P. T. O.

OR

- (b) Why bit plane slicing is required for digital image processing ? How 8-bit gray-scale image can be converted into an equivalent of the 3-bit gray-scale image ? Explain and justify your answer using MATLAB code. 10 Marks (CO2)
3. (a) What is the need of wavelet transform in image processing ? Show the working of wavelet transform using MATLAB code by applying smoothness over the grayscale image. 10 Marks (CO1, CO2)

OR

- (b) What are the effects of applying median filter to the noisy image ? Why does the noise considered to be an additive in images ? Apply median filter and show all steps by taking an example of  $5 \times 5$  image matrix. 10 Marks (CO1, CO2)
4. (a) How coding system works for image compression using Huffman coding algorithm ? Explain with a suitable example. Also differentiate between lossless image compression and lossy image compression. 10 Marks (CO2, CO3)

OR

- (b) How do low pass and high pass filters work in image processing ? Which type of filter is effectively works for image sharpness ? Explain and justify your answer with a suitable example. 10 Marks (CO2, CO3)
5. (a) Explain why the discrete histogram equalization technique does not, in general, yield a flat histogram. Consider below input image matrix and compute the equalized histogram with 6 gray levels. Show each step

(3)

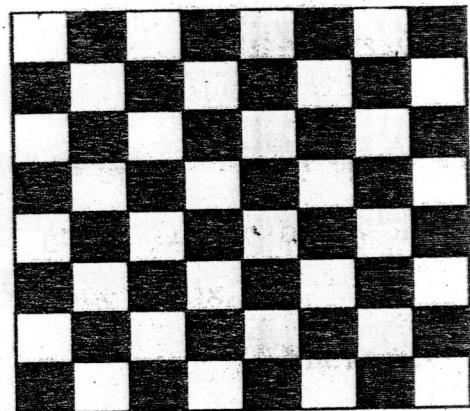
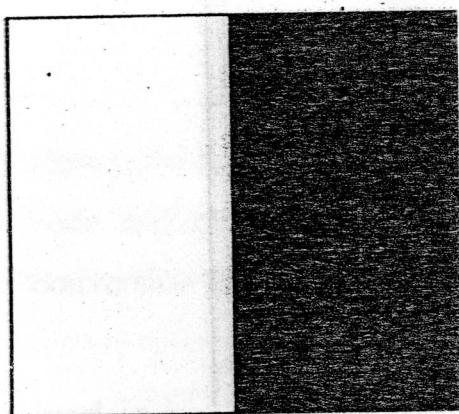
carefully. Draw the histograms of the original and equalized images as well as the equalization transformation. 10 Marks (CO2, CO3)

4	1	3	2
3	1	1	1
0	1	5	2
1	1	2	2

input image

OR

- (b) The two images shown below in Figure are quite different, but their histograms are identical. Both images have size  $8 \times 8$ , with black and white pixels. Suppose that both images are blurred by applying a filter. Would the resultant histograms still be the same ? Draw approximately the two histograms and justify your answer. 10 Marks (CO2, CO3)



(2)

OR

**Roll No. ....**

(d) How can we perform scheduling in Jenkins ? Explain by giving examples.

**TCS-651**

(s) How to use DevOps tools like Jenkins, Git, Docker etc. Explain by giving examples.

**B. TECH. (SIXTH SEMESTER)**

**MID SEMESTER EXAMINATION, April/May, 2022**

DEVOPS ON CLOUD

Time : 1½ Hours

Maximum Marks : 50

(Note : (i) Answer all the questions by choosing any **one** of the sub-questions.

(ii) Each question carries 10 marks.

1. (a) Which are the top DevOps tools ? How do all these tools work together ? 10 Marks (CO1, CO3)

OR

(b) Describe the use of Source code management system. What are the benefits of using version control ? 10 Marks (CO1, CO3)

2. (a) Write down the steps for configure notifications in Jenkins.

10 Marks (CO1, CO2)

OR

(b) Explain Audit Trail and the advantages of using audit trail plugin in Jenkins. 10 Marks (CO1, CO2)

3. (a) Differentiate between DevOps and Agile software development.

10 Marks (CO2)

**P. T. O.**

(2)

OR

- (b) How can we perform scheduling in Jenkins ? Explain poll SCM in detail. 10 Marks (CO2)
4. (a) How to ‘automate’ testing in DevOps lifecycle ? Explain by using a flow chart. 10 Marks (CO3)
- OR
- (b) Summarize Selenium and its components. 10 Marks (CO3)

5. (a) Demonstrate the working of any five “git” commands.

10 Marks (CO1, CO2)

(ii) Explain deployment strategies 10 Marks (CO1, CO2)

- (b) What is a CI/CD Pipeline ? 10 Marks (CO1, CO2)

10 Marks (CO1, CO2)

OR

- (p) Describe the use of Git for source code management system. What are the benefits of using version control ? 10 Marks (CO1, CO2)

10 Marks (CO1, CO2)

OR

- (d) Explain Ansible Playbook and the advantages of using such tool in Jenkins 10 Marks (CO1, CO2)

10 Marks (CO1, CO2)

200

- (TCS-651) 10

R.T.O.

(2)

Roll No. ....

10 Marks (CO2)

following cloud service providers :

(i) Google Cloud Platform

(ii) Microsoft Azure

(iii) Amazon Web Services

## TCS-622

### B. TECH. (CSE) (SIXTH SEMESTER)

### MID SEMESTER EXAMINATION, April/May, 2022

#### CLOUD COMPUTING TECHNOLOGIES

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any *one* of the sub-questions.

(ii) Each question carries 10 marks.

1. (a) Discuss the total cost of ownership for cloud computing. How would you categorize various types of cost involved in traditional processing ?

10 Marks (CO3)

OR

- (b) What are the advantages and disadvantages of using cloud computing as compared to the traditional means of using computation services ?

10 Marks (CO1)

2. (a) Write a note on the history of cloud computing.

10 Marks (CO1)

OR

- (b) Write short notes on any *two* of the following :

10 Marks (CO2)

(i) Grid computing

(ii) Parallel computing

(iii) Distributed computing

TCS-622

P. T. O.

(2)

3. (a) Present at least 5 different cloud based services for any *one* of the following cloud service providers : 10 Marks (CO2)

- (i) Google Cloud Platform
- (ii) Microsoft Azure
- (iii) Amazon Web Services

OR

- (b) Write short notes on any *two* of the following : 10 Marks (CO2)

- (i) Edge computing
- (ii) Fog computing
- (iii) Utility computing

4. (a) Discuss the vision of cloud computing. According to you what are the milestones for achieving this vision. 10 Marks (CO2)

OR

- (b) Virtualization is a major enabler for cloud computing. Elaborate on the statement and discuss the role of virtualization in cloud computing.

10 Marks (CO2)

5. (a) How do you classify different types of cloud based services ?

10 Marks (CO1)

OR

- (b) Write a short note on evolution of Web 3.0. 10 Marks (CO2)

10 Marks (CO2)

(i) Grid computing

(ii) Pervasive computing

160  
Digital computing

(2)

10 Marks (CO1)

3. (a) Describe the following security mechanisms : Roll No. ....

Encryption and digital signature

**TCS-619**

What is the objective of 'malware', using the Above Cipher

What are the steps followed by a virus to carry out the

Attack ?

What is the difference between a worm and a virus ?

What is the difference between a trojan and a virus ?

What is the difference between a spyware and a virus ?

What is the difference between a rootkit and a virus ?

What is the difference between a ransomware and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

What is the difference between a勒索软件 and a virus ?

OR

### **B. TECH. (CSE, CSE-IS) (SIXTH SEMESTER)**

**MID SEMESTER EXAMINATION, April/May, 2022**

#### **NETWORK AND SYSTEM SECURITY**

**Time : 1½ Hours**

**Maximum Marks : 50**

**Note :** (i) Answer all the questions by choosing any **one** of the sub-questions.

(ii) Each sub-question carries 10 marks.

1. (a) State the following security requirements in your own words : forward secrecy, non-repudiation and access control. 10 Marks (CO4)

OR

- (b) Design a secure key distribution protocol using the asymmetric key cryptography. You can assume two communicating parties (i. e., Party A and Party B) in the network. Designed protocol should be secured against replay, MiTM, impersonation and other possible attacks. 10 Marks (CO4)

2. (a) How would you compare the symmetric and asymmetric key cryptosystems ? Which approach would you use in the secure key distribution ? 10 Marks (CO3)

OR

- (b) A communication system follows the procedure of the RSA algorithm to secure the exchanged messages. Suppose the values of two large prime numbers are  $p = 7$ ,  $q = 13$  and the value of public key  $(e, n)$  is  $(5, 91)$ . Then what will be the value of the corresponding private key  $(d, n)$ . 10 Marks (CO3)

**P. T. O.**

(2)

3. (a) Describe the following security mechanisms : 10 Marks (CO1)

Encipherment and digital signature

OR

- (b) What is the ciphertext of 'welcometogeu' using the Affine Cipher algorithm. The values of keys are 3 and 5. Provide your views on the security of Affine Cipher algorithm. 10 Marks (CO1)

4. (a) How would you summarize the model for network security ? Where it is applicable ? 10 Marks (CO2)

OR

- (b) Find out the ciphertext of 'math' using the steps of Hill Cipher algorithm with the help of following key matrix : 10 Marks (CO2)

3	2
1	5

5. (a) Compare the usability of following network security appliances :

Firewall and intrusion detection system. 10 Marks (CO5)

OR

- (b) How would you compare the following security schemes ?  
Authentication tied to plaintext and authentication tied to ciphertext.

10 Marks (CO5)

TCS-661  
TCS-661  
Roll No. ....

**TCS-661**

**B. TECH. (SE) (SIXTH SEMESTER)**

**MID SEMESTER EXAMINATION, April/May, 2022**

**SOFTWARE PROJECT MANAGEMENT**

**Time : 1½ Hours**

**Maximum Marks : 50**

**Note :** (i) Answer all the questions by choosing any *one* of the sub-questions.  
(ii) Each question carries 10 marks.

1. (a) Describe different phases of Software Project Management Cycle. 10 Marks (CO1)  
**OR**  
(b) Discuss all the objectives of Software Project Management.

10 Marks (CO1)

2. (a) With the help of SEL model on a software development calculate following for 6 person-years of effort. 10 Marks (CO1, CO2)
  - (i) Calculate the number of lines of source code that can produced.
  - (ii) Calculate the duration of the development.
  - (iii) Calculate the productivity in LOC/PY.
  - (iv) Calculate the average manning.

**P. T. O.**

OR

- (b) Differentiate between the following : 10 Marks (CO1, CO2)
- PERT and Gantt Chart
  - Incremental and Evolutionary Prototype
3. (a) A home contractor is working on a four-bedroom home. The optimistic time estimate ( $t_0$ ) was 140 days, the most likely time estimate ( $t_m$ ) was 160 days and the pessimistic time ( $t_p$ ) estimate was 400 days. What will be the expected time ? 10 Marks (CO2)
- OR
- (b) Differentiate between Activity on Node and Activity on Arrow Diagram with a proper example. What is the significance of identifying critical path for software development activities ? 10 Marks (CO2)
4. (a) A product manager has planned a list of activities culminating in the inaugurate launch of the new products. What is the probability that product manager will be able to complete the language launch within 80 days-time ? 10 Marks (CO2)

Activity	Pert 3 time estimates days			Immediate predecessor (s)
	P	M	O	
a	20	10	5	-
b	12	7	5	-
c	12	10	8	a
d	40	20	6	c

	90	60	30	d
f	14	10	7	d
g	50	30	20	c
h	12	10	8	e, f, g
i	6	4	3	b
j	1	1	1	h, i

OR

- (b) Draw an Activity on Node network diagram and perform forward and backward pass calculations : 10 Marks (CO2)

Activity	Predecessor	Duration
A	-	5
B	A	4
C	OR A	5
D	B, C	6
E	C, D	7
F	D	10 Marks (CO1, CO2)
G	F	2
H	E, G	1

5. (a) Enlighten the importance of planning in Software development. Discuss different types of these plans. 10 Marks (CO1, CO2)

**OR**

- (b) Summarize the meaning and role of Work Breakdown Structure in project scheduling with its characteristics and example. 10 Marks (CO1, CO2)

will be the expected time? 10 Marks (CO2)

- (d) Draw an Activity on Node Network diagram and explain forward and backward pass times. 10 Marks (CO2)

differentiate between Activity on Node and Activity on arrow Diagram 10 Marks (CO2)

- proper example illustrate the significance of identifying critical activities in software development activities. 10 Marks (CO2)

4. An IT manager has planned a list of activities culminating in the language launch of the new products. What is the probability that the manager will be able to complete the language launch within 160 days? 10 Marks (CO2)

Activity	Period time estimates days					Immediate predecessor
	B	C	D	E	F	
a	20	18	15	10	5	-
b	12	14	16	18	10	-
c	12	14	16	18	10	a
d	40	30	20	15	10	c

160

**TIT-608**

**B. TECH. (IT) (SIXTH SEMESTER)**  
**MID SEMESTER EXAMINATION, April/May, 2022**

**INFORMATION THEORY AND CODING**

Time : 1½ Hours

**Maximum Marks : 50**

**Note :** (i) Answer all the questions by choosing any *one* of the sub-questions.  
 (ii) Each question carries 10 marks.

1. (a) What are the different types of signals ? Contrast difference between them. 10 Marks (CO2)

**OR**

- (b) Describe information rate. Find information rate of a source emitting 04 messages with probability  $1/8, 3/8, 1/8, 3/8$ . The signal is sampled with Nyquist rate. 10 Marks (CO1)

2. (a) Draw a neat and clean block diagram of basic digital communication and set up a contrast between digital and analog systems. 10 Marks (CO1)

**OR**

- (b) Prove that the amount of information transferred is equal if the digits are occurring with equal likelihood in a binary pulse code modulation. 10 Marks (CO1)

**P. T. O.**

(2)

3. (a) Define the terms : 10 Marks (CO3)

- (i) Mutual Information
- (ii) Conditional Entropy
- (iii) Cyclic Codes
- (iv) Modulation

OR

(b) Calculate entropy when  $P_k = 0$  and when  $P_k = 1$ . 10 Marks (CO3)

4. (a) Why do we need Error Control Coding ? What can be advantages and disadvantages of implying these techniques in communication ? 10 Marks (CO5)

(b) How many bits may be required for encoding the message 'tabbloboo' using Huffman Coding Technique ? 10 Marks (CO5)

5. (a) What are the basic elements of Pulse Code Modulator ? Support your answer with a block diagram. 10 Marks (CO4)

OR

(b) Derive and prove the properties of Entropy. 10 Marks (CO4)

OR

(d) Prove that the amount of information transmitted is equal if the digits are occurring with equal likelihood in a binary base code modulation.

100

TIT-608 10 Marks (CO1)

Roll No. ....

# TCS-693

## B. TECH. (CSE) (SIXTH SEMESTER)

### MID SEMESTER EXAMINATION, April/May, 2022

#### FULL STACK WEB DEVELOPMENT

Time : 1½ Hours

Maximum Marks : 50

Note : (i) Answer all the questions by choosing any **one** of the sub-questions.

(ii) Each question carries 10 marks.

1. (a) What is the difference between static and dynamic web pages ? Which technologies we have discussed in our course are needed to design and develop them ? Explain their objectives and how these interact with each other to create a website. 10 Marks (CO2, CO4)

OR

- (b) What do you mean by the get and post method in an HTML form ? Create an HTML form having the following elements with mentioned constraints - username (required), email (required), contact (required, the field having a length of 10, should contain only digits), gender (required, radio box and one of the gender already checked), city (required, drop-down and at-least one option already selected, submit button). 10 Marks (CO2, CO4)

2. (a) What is the difference between the following attributes of an HTML form and input elements ? Explain each of them using suitable examples : type, name, placeholder, method, action, value. Write the code to create a button with a link that opens www.google.com when clicked.

10 Marks (CO3, CO4)

OR

- (b) What are various ways to include CSS and JavaScript in your web pages ? Explain all of them by taking a simple example like taking array of numbers from user, find reverse of each number and stored in separate array by using a double click on button. 10 Marks (CO3, CO4)

3. (a) Write a JavaScript code to find how many days are left for Xmas when a button is clicked. Explain the use of Java Script functions like – getElementByld, getElementsByClassName and getElementsByTagName. 10 Marks (CO4, CO5)

OR

- (b) To include some of the JavaScript libraries like Bootstrap, you can either download in your system or use CON. Can you explain the advantages and disadvantages of both these approaches ? Also, we can either include the JavaScript code at the top of the page in the head tag or at the end of a web page, just before the Body tag ends. Which of them is suitable according to you and why ? 10 Marks (CO4, CO5)

4. (a) Explain div box model with example. Write an external cascading style sheet to define the font, font color, background and foreground colors and various table tag properties. Also define inherit property in CSS.

10 Marks (CO2, CO3)

(3)

OR

- (b) Write a program to create a canvas and randomly draw rectangles with different colors by clicking on it. 10 Marks (CO2, CO3)
5. (a) What does DOM stand for ? Explain the topmost objects in the DOM. Explain The Windows Object in detail. 10 Marks (CO4)

OR

- (b) Explain, how events are handled in JavaScript. Write an event handler program using function that takes a string which has lower- and upper-case letters as a parameter and converts upper-case letters to lower-case, and lower-case letters to upper-case. 10 Marks (CO4)

Note : (i) Answer all the questions by choosing any *one* of the sub-questions.  
(ii) Each question carries 10 marks.

- I. (a) What is the difference between static and dynamic web pages ? Which technologies we have discussed in our course are needed to design and develop them ? Explain their objectives and how these interact with each other to create a website. 10 Marks (CO2, CO4)

OR

- (i) What is the difference between get and post method in an HTML form ? Create an HTML form containing the following elements with mentioned constraints - username (required), email (required), contact (required, the field having a length of 10, should contain only digits), gender (radio button radio box and one of the gender already checked), city (dropdown menu and at-least one option already selected, submit

TCS-693

1000  
10 Marks (CO2, CO4)

else

OR

Roll No. ....

**TIT-607****B. TECH. (IT)/B. TECH. (CSE-SE) (SIXTH SEMESTER)****MID SEMESTER EXAMINATION, April/May, 2022****SOFTWARE VERIFICATION, VALIDATION & TESTING****Time : 1½ Hours****Maximum Marks : 50**

**Note :** (i) Answer all the questions by choosing any **one** of the sub-questions.

(ii) Each question carries 10 marks.

1. (a) Discuss the software testing model and the significance of testing methodology. 10 Marks (CO1, CO2, CO3)

**OR**

- (b) Briefly discuss the software testing goals. 10 Marks (CO1, CO2, CO3)
2. (a) Compare effective software testing vs. exhaustive software testing.  
Which is better ? Justify your answer. 10 Marks (CO1, CO2, CO3)

- (b) (i) Compare Failure, Defect and Error. 10 Marks (CO1, CO2, CO3)
- (ii) Explain the significance of Testware and Test Case. 10 Marks (CO1, CO2, CO3)

3. (a) Identify 5 bugs that you can identify in a library management software application. 10 Marks (CO1, CO2, CO3)

**P. T. O.**

OR

- (b) How are bugs classified based on their criticality and based on SDLC phases ? 10 Marks (CO1, CO2, CO3)
4. (a) A program computes  $a^b$  where a lies in the range [1, 10] and b within [1, 5]. Design test cases for this program using BVC, robust testing, and worst-case testing methods. 10 Marks (CO4, CO5)
- OR
- (b) A program takes an angle as input within the range [0, 360] and determines in which quadrant the angle lies. Design test cases using equivalence class partitioning method. 10 Marks (CO4, CO5)
5. (a) Consider the following program that reads in a string and then checks the type of each character :
- ```
main()
{
    char string[80];
    int index;
    printf("Enter the string for checking its characters");
    scanf("%s", string);
    for(index = 0; string[index] != '\0'; ++index) {
        if((string[index]>= '0' && (string[index] <='9')) ||
           ((string[index] >= 'A' && string[index] <='Z')) ||
           ((string[index] >= 'a' && (string[index] <='z'))))
            printf("%c is a digit", string([index]);
        else if ((string[index] >= 'A' && string[index] <='Z') ||
                 (string[index] >= 'a' && (string[index] <='z'))))
            printf("%c is an alphabet", string[index]));
    }
}
```
- OR

(3)

```
else
    print("%c is a special character", string [index]);
}
}
```

Draw the DD graph for the program and calculate the cyclomatic complexity of the program using all the methods. List all independent paths and design test cases from independent paths.

10 Marks (CO4, CO5)

OR

- (b) Briefly describe the objectives of regression testing and what are the situations to perform regression testing ? 10 Marks (CO4, CO5)

(ii) Each question carries 10 marks

- (a) Discuss the software testing model and the significance of testing methodology. 10 Marks (CO1, CO2, CO3)

OR

- (b) Briefly discuss the software testing goals. 10 Marks (CO1, CO2, CO3)

- (c) Compare selective software testing vs. exhaustive software testing. Which is better ? Justify your answer. 10 Marks (CO1, CO2, CO3)

- (b) (i) Compare Failure, Defect and Error. 10 Marks (CO1, CO2, CO3)  
(ii) Explain the significance of Testware and Test Case. 10 Marks (CO1, CO2, CO3)

- (c) Identify 5 bugs that you can identify in a library module of a software 100