

Bachelor of Engineering
Third Semester Main Examination, Dec-2020
Communication Skills (HU220T)
Branch-CE/EE/EC/CS/IT/ME

Time: 3:00 Hrs

Max Marks 70

Note : (i) Attempt any five questions. All questions carry equal marks.
(ii) Answer should be precise & to the point only.
(iii) Assume suitable data if necessary & state them clearly

- Q.1** (a) What is communication? Explain importance of communication in detail?
(b) What are different barriers to communication and how will you eliminate them?
- Q.2** (a) How are non-verbal communication in an online environment?
(b) What do you mean by communication styles? Explain.
- Q.3** (a) Define cycle of communication. Discuss the role of feedback in the cycle of communication.
(b) What do you mean by encoding & decoding of the message? What is the role of source and receiver in communication?
- Q.4** (a) What are some examples of non-verbal signals that we convey in communication with other peoples?
(b) What is the importance of studying non-verbal communication?
- Q.5** (a) Discuss the level of communication.
(b) What are the different challenges in communication?

- Q.6** (a) What is paralinguistic features of communication.
(b) What is volume in paralinguistics?
- Q.7** (a) What is proxemics in non-verbal communication?
(b) Discuss the features importance to make an oral presentation effective.
- Q.8** Write short notes on- **(Marks=14)**
(a) Feedback
(b) Semantic barriers
(c) Voice modulation
(d) Gesture.

Bachelor of Engineering
Third Semester Main Examination, Dec-2020
Analysis and Design of Algorithms [IT-221]
Branch: IT

Time: 3:00 Hrs

Max Marks 70

Note : 1. Attempt any five questions out of Eight.
2. All question carry equal marks.

- Q.1 a) Define space complexity and time complexity.
(b) How can we prove that Strassen's matrix multiplications advantageous over ordinary matrix multiplications?
- Q.2 (a) What is minimum spanning trees? Explain in detail.
(b) What is Reliability design using dynamic programming? Explain with example.
- Q.3 (a) Show that Hamiltonian cycle in NP complete.
(b) Differentiate between NP-Complete and NP hard problems.
- Q.4 (a) What are "Queues"? Explain how to insert and delete an element from queue with suitable algorithm
(b) Explain multistage graphs with examples. Write multistage graph algorithm to forward approach
- Q.5 (a) Explain 4-queen problem. Apply backtracking to find the solution.
(b) What do you understand by Graph Traversal? Show how it is done using the example of BFS by considering the directed graph
- Q.6 (a) What are "Queues"? Explain how to insert and delete an element from queue with suitable algorithm.
(b) Create a B-tree for the following list of elements $L = \{86, 50, 40, 3, 94, 10, 70, 90, 110, 113, 116\}$ given minimization factor = 3, minimum degree = 2 and maximum degree = 5.
- Q.7 (a) What is Reliability design using dynamic programming? Explain with example.
(b) Solve the subset sum problem using Back tracking where $n = 4$, $m = 18$, $w[4] = \{5, 10, 8, 13\}$.
- Q.8 Write short notes on:
(i) Least cost search (ii) Asymptotic notation
(iii) Huffman coding (iv) Binary search

Bachelor of Engineering
Third Semester Main Examination, Dec-2020
Digital circuit & Design [IT-222]
Branch - IT

Time: 3:00 Hrs

Max Marks 70

Note : 1. Attempt any five questions out of eight.
2. Answer should be precise & to be point only.

- Q.1 (a) Write down AND gate, NAND gate and EX-OR gate with suitable diagram and truth table.
(b) Explain De- Morgan's theorem with example.
- Q.2 (a) Express the Boolean function $F = A + B'C$ as a standard sum of minterms.
(b) Explain full adder with diagram and truth table
- Q.3 (a) Explain multiplexer with suitable sketch.
(b) What is decoder and explain how 3×8 decoder is constructed?
- Q.4 (a) Explain SR flip-flop and J-K flip-flop.
(b) What is difference between edge triggering and level triggering?
- Q.5 (a) Describe synchronous and asynchronous counter with suitable example.
(b) What is universal shift register? Explain it.
- Q.6 (a) Describe with circuit diagram of ring counter and shift counter.
(b) Describe the following logic families.
(i) RTL (ii) DTL (iii) TTL
- Q.7 (a) Differentiate between PLA and PAL.
(b) Write short notes on (i) PROM (ii) EPROM (iii) Static RAM
- Q.8 (a) Explain CMOS inverter and CMOS gates.
(b) Describe half subtractor and full subtractor with circuit diagram and truth table.

Bachelor of Engineering
Third Semester Main Examination, Dec-2020
Object Oriented Programming & Methodology [IT-223]
Branch - IT

Time: 3:00 Hrs

Max Marks 70

Note : 1. Attempt any five questions out of Eight.
2. All question carry equal marks.

- Q.1 (a) Explain dynamic memory allocation in C++ with example.
(b) Explain the concept of encapsulation with example.
- Q.2 (a) What is function? Discuss the function overloading with example.
(b) Describe the concept of call by value and call by reference with an example.
- Q.3 (a) Explain control statement with taking a suitable example.
(b) Explain with example what is constructor? How we invoke a constructor function?
- Q.4 (a) Explain virtual function and friend function with suitable example.
(b) Briefly explain exception handling and containers.
- Q.5 (a) Explain and differentiate between run time and compile time polymorphism.
(b) Explain various types of inheritance. Give any two advantages of inheritance.
- Q.6 (a) What do you mean by access specifiers? Define their types and accessibility levels with example.
(b) Define abstract class? What is the importance of abstract class explain with suitable example?
- Q.7 (a) Discuss in detail about OOPS concepts.
(b) State the difference between following:-
(i) Object oriented programing and procedure oriented programing
(ii) C and C++
- Q.8 Write short note on-
i) Message passing
ii) Types of association
iii) Class and object

Bachelor of Engineering
Third Semester Main Examination, Dec-2020
Discrete Structures [IT-224]
Branch-IT

Time: 3:00 Hrs**Max Marks 70**

Note : Attempt any five questions. All questions carry equal marks.

- Q.1 (a) Define -
 i) Group
 ii) Monoid
 iii) Abelian group
 (b) Represent on truth table $\sim (P \wedge \sim q)$

- Q.2 (a) Explain basic logical operation.
 (b) Describe finite state machine.

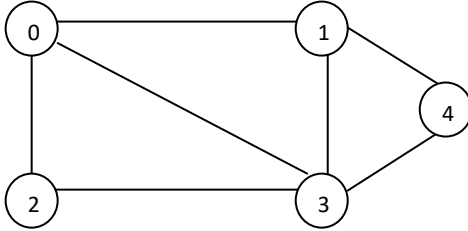
- Q.3 (a) Define -
 i) Degree of a vertex
 ii) Even and odd vertex
 iii) Path
 (b) Draw a graph with given matrix

	A	B	C	D	E
A	0	1	1	1	0
B	1	0	0	1	1
C	1	0	0	1	0
D	1	1	1	1	1
E	0	1	0	1	0

- Q.4 (a) State and prove binomial theorem.
 (b) Expand $(2x-5y)^7$ with the help of binomial expansion.

- Q.5 (a) Show that $\{1, -1, i, -i\}$ be the group with respect to multiplication.
 (b) Define -
 i) Set
 ii) Countable set
 iii) Uncountable set

- Q.6 (a) Represent this graph into adjacency matrix.



- (b) Describe graph and its types.

- Q.7 (a) Define lattice and describe type of lattice.
 (b) Draw Hasse diagram for D_{12}

- Q.8 (a) Define with example-
 i) Function
 ii) One one function
 iii) Onto function
 iv) Bijective function
 (b) Define-
 i) Ring
 ii) Field

Bachelor of Engineering
Third Semester Main Examination, Dec-2020
Mathematics-III [MA-220]
Branch-EE/EC/CS/IT

Time: 3:00 Hrs**Max Marks 70****Note : Attempt any five questions.****All question carry equal marks.**

- Q.1 (a) State and prove Cauchy's theorem.
 (b) Show that the function $e^x(\cos y + i \sin y)$ is analytic and find its derivative.
- Q.2 (a) Using Cauchy's integral formula prove that : $\int_C \frac{e^{2z}}{(z+1)^4} dz = \frac{8\pi e^{-2}}{3} i$, where C is the circle $|z| = 3$.
 (b) Find the imaginary part of the analytic function whose real part is $x^3 - 3xy^2 + 3x^2 - 3y^2$.
- Q.3 (a) Find the real root of the equations $x^3 - 9x + 1 = 0$ by the method of false position.
 (b) Apply Newton Raphson method to solve $3x = \cos x + 1$.
- Q.4 (a) Using Newton's forward Interpolation formula, find the value of $f(1.6)$, if
 $x: \quad 1 \quad 1.4 \quad 1.8 \quad 2.2$
 $y: \quad 3.49 \quad 4.82 \quad 5.96 \quad 6.5$
 (b) Solve the following system by Gauss elimination method
 $6x_1 + 3x_2 + 2x_3 = 6$
 $6x_1 + 4x_2 + 3x_3 = 0$
 $20x_1 + 15x_2 + 12x_3 = 0$
- Q.5 (a) Apply Lagrange's formula to find the value of x when $f(x) = 0$ given that
 $x: \quad 30 \quad 34 \quad 38 \quad 42$
 $f(x): \quad -30 \quad -13 \quad 3 \quad 18$
 (b) Solve initial value problem $\frac{dy}{dx} = 1 + xy^2$, $y(0)=1$ for $x = 0.4, 0.5$ by using Milne's method when it is given that
 $x: \quad 0.1 \quad 0.2 \quad 0.3$
 $y: \quad 1.105 \quad 1.223 \quad 1.355$

Q.6 (a) Solve the equation $\frac{dy}{dx} = x + y$ with initial condition $y(0) = 1$ by Runge kutta rule from $x = 0$ to $x = 0.4$ with $h = 0.1$

(b) Evaluate $\int_{0.5}^{0.7} x^{1/2} e^{-x} dx$ approximately by using a suitable formula.

Q.7 (a) Solve the following by Euler's modified method, the equation $\frac{dy}{dx} + \log(x + y)$, $y(0) = 2$ at $x = 1.2$ and 1.4 with $h = 0.2$

(b) Use picard's method to approximate y when $x = 0.2$ given that $y = 1$ when $x = 0$ and $\frac{dy}{dx} = x - y$

Q.8 (a) Find the z Transform of Sinak, k7,0

(b) Solve the following by Gauss Seidel iteration Method

$$10x + y + z = 12$$

$$2x + 10y + z = 13$$

$$2x + 2y + 10z = 14$$