Enrol. No. S R H U | Regn. No. D D

END SEMESTER EXAMINATION, JUNE- 2024

BCA Semester – II / B. Tech. Semester - II

Course Name: Human Values & Professional Ethics **Course Code: HS121T/HST121**

Time allotted: 03 Hours **Max. Marks: 100**

Note: Read all the instructions carefully.

Q.1. Objectives Type

(Very short/ Short Answer, MCQ, One-liners, Fill in the Blank, True/ False) Attempt all. (10×2=20)

a.	Which value is essential for fostering trust and credibility in personal and professional relationships? i. Empathy ii. Honesty iii. Courage iv. Self-exploration	PO-6,8,12 CO-1
b.	According to the Indian concept of values, Purushartha emphasizes: i. Pleasure and enjoyment ii. Duty, righteousness, and wealth iii. Meditation and asceticism iv. Compassion and forgiveness	PO-6,8,12 CO-3
c.	Which of the following is NOT one of the Yamas in Indian ethical principles? i. Ahimsa (non-violence) ii. Satya (truthfulness) iii. Asteya (non-stealing) iv. Daya (compassion)	PO-6,8,12 CO-2
d.	The Value Spectrum emphasizes that a good life is not solely dependent on: i. Wealth accumulation ii. Power and influence iii. Personal relationships iv. Physical health	PO-6,8,12 CO-2
e.	What do professional ethics govern? i. Personal friendships ii. Business profits iii. Behaviour of professionals iv. Political affiliations	PO-6,8,12 CO-4
f.	How to achieve family harmony and which values help?	PO-6,8,12 CO-3
g.	Provide an example of how empathy can be practiced in daily life.	PO-6,8,12 CO-1
h.	How Tapas leads to personal growth?	PO-6,8,12 CO-2
i.	List two components of harmony in the family.	PO-6,8,12 CO-2
j.	Define Professional Ethics .	PO-6,8,12 CO-4

P.T.O./-

Q.2. Short notes / Short Answer Type (Attempt any five out of Seven) (5×4=20)

a.	How does discipline contribute to personal success?	PO-6,8,1 CO-
b.	How does the Value Spectrum encourage individuals to pursue happiness?	PO-6,8,12 CO-
c.	Define safety needs.	PO-6,8,12 CO-3
d.	How does Saucha manifest physically and mentally?	PO-6,8,12 CO-2
e.	How are Indian values explained through the concept of Niyamas?	PO-6,8,12 CO-2
f.	How to achieve family harmony and which values help?	PO-6,8,12 CO-3
g.	List three universal values.	PO-6,8,12 CO-1

Q.3. Structured Question (Attempt any three out of four) (3×10=

a.	**i)** What are human values and their importance in daily life? **ii)** How do values shape behaviour, **iii)** and can you provide examples?	PO-6,8,1 CO-1
b.	i) What are the five Yamas according to the Indian philosophy. ii) In what ways does Santosha (contentment) contribute to overall well-being and inner peace, as emphasized in the Niyamas? iii) How does Tapas strengthen one's resolve and resilience in pursuing long-term goals?	PO-6,8,12 CO-2
c.	**i)** What does the term "family" mean in the broader sense? **ii)** How does the concept of family contribute to an individual's sense of identity? **iii)** In what ways can understanding the meaning of family enhance personal development?	PO-6,8,12 CO-3
d.	**i)** What is the concise definition of "Computer Ethics"? **ii)** How does computer ethics focus on the moral and social impacts of technology? **iii)** Provide a brief example illustrating the role of computer ethics in decision-making.	PO-6,8,12 CO-4

Q.4. Long Answer / Essay type (Attempt any two out of three) (2×15=

a.	(i)	Define "human values" and explain their societal significance.	PO-6,8,1
	(ii)	How does value education contribute to the holistic development of students?	CO-1
b.	(i)	What is Purushartha?	PO-6,8,12
	(ii)	How the concept of Purushartha influences ethical decision-making and moral conduct in today's world.	CO-2
c.	(i)	What are the five levels of Maslow's Hierarchy of Needs?	PO-6,8,12
	(ii)	Provide a brief explanation of each level.	CO-2

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END SEMESTER EXAMINATION, JUNE- 2024

B. Tech. Semester - II

Course Name: Object Oriented Programming Using C++ **Course Code: CST122**

Time allotted: 03 Hours **Max. Marks: 100**

Note: Read all the instructions carefully.

Q.1. Attempt all. **(10×2=20)**

QN	Questions	CO	PO
a.	Differentiate data abstraction and data encapsulation?	1	1
b.	Explain the term generalization.	3	1
c.	Write the syntax to declare an array in C++?	2	1
d.	What is the role of garbage collection?	2	1
e.	Explain the term association.	1	1
f.	Name the operator which cannot be overloaded.	3	1
g.	What do you mean by composition?	3	1
h.	What do you mean by streams in C++?	3	1
i.	Explain the term overloading in C++?	3	1
j.	Virtual function is used to achieve _____ polymorphism.	3	1

Q.2. Attempt any five out of Seven. **(5×4=20)**

QN	Questions	CO	PO
a.	Why do we use virtual destructor in C++? Explain with an example.	3	1,2,5
b.	What do you mean by abstract class? Explain with a suitable program.	2	1,2,5
c.	Write a program in C++ to check whether a given number is palindrome number or not.	1	1,2,4,5
d.	Write a program to show the use of constructor overloading?	2	1,2,5
e.	What do you mean by file handling? Explain all the modes used in files. How can we open a file in C++?	4	1,2
f.	Differentiate hierarchical and multiple inheritance using a suitable program.	3	1,2,5
g.	What is inline function and why do we use it? Write a program to show the use of inline function.	2,3	1,2,5

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Q.3. Attempt any three out of four. **(3×10=30)**

QN	Questions	CO	PO
a.	Write a program to write to and read from a file in C++.	4	1,2,5
b.	Differentiate virtual function and pure virtual function in detail.	3	1,2
c.	Write a program of hybrid inheritance in C++ using virtual keyword.	2,3	1,2,5
d.	How can you handle an exception in C++? Explain with a suitable example.	4	1,2,5

Q.4. Attempt any two out of three. **(2×15=30)**

QN	Questions	CO	PO
a.	What do you mean by polymorphism? Differentiate compile time polymorphism and run time polymorphism with suitable examples.	3	1,2,5
b.	Explain the following keywords used in C++: • **public** • **private** • **protected**	2	1,2
c.	i. What do you mean by dynamic memory allocation? Explain the use of new and delete operator with suitable example. Also compare it with static memory allocation. ii. What do you mean by garbage Collection? Explain.	2	1,2,3 ,4,5

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END SEMESTER EXAMINATION, JUNE- 2024

B. Tech. Semester - II

Course Name: Digital Electronics **Course Code: CST124**

Time allotted: 03 Hours **Max. Marks: 100**

Note: Read all the instructions carefully.

Q.1 Objective Type: Very short answer questions. Attempt all. **(10 x 2 = 20)**

a.	Convert the following number to decimal: $(4310)_5$	C.O. – 01
b.	Convert the hexadecimal number 64CD to binary and octal.	C.O. – 01
c.	Define Universal gates.	P.O. – 02
d.	What is the drawback of Boolean algebraic simplification?	C.O. – 02
e.	List the truth table of the function: $F = BC + A'C'$	C.O. – 02
f.	A = 10110001 and B = 10101100, perform NAND & XOR operations between A & B.	C.O. – 02
g.	Write the truth table of Latch using NAND gates.	C.O. – 04
h.	Define the Mealy machine.	C.O. – 04
i.	How many states will be there in the Twisted-tail counter?	C.O. – 04
j.	Expand the following terms: (a) CPLD (b) HDL	C.O. - 05

Q.2 Short Answer Type: Attempt **any Five** out of seven. **(5 x 4 = 20)**

a.	Express the Decimal Digits 0-9 in 2421 and 8 4-2-1.	C.O. – 01
b.	Mention the different types of flip-flops along with their drawbacks.	C.O. – 04
c.	List the different shift registers and draw any one of them.	C.O. – 04
d.	What is meant by 'Edge triggered'? Differentiate between SR-FF and JK-FF.	C.O. – 03
e.	Draw and explain the positive edge triggered J-K flip-flop with its truth table.	C.O. – 04
f.	Write any four Huntington Postulates.	C.O. – 02
g.	Write any four theorems of Boolean algebra.	C.O. - 02

P.T.O./-

Q.3 Structured Questions: Attempt **any Three** out of four. **(3 x 10 = 30)**

a.	Explain the usage of Multiplexers in the design of boolean functions with an example.	C.O. – 04
b.	F1 (A, B, C, D) = ∑m (1, 3, 4, 5, 9, 10, 11) + d (6, 8) Simplify the Boolean function using K-map and realize using only NAND gates.	P.O. - 02
c.	i. Simplify the following Boolean expressions using K-MAP: F (x, y, z) = ΠM (2, 3, 4, 5) ii. F (w, x, y, z) = ΠM (0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)	C.O. – 01
d.	i. Realize Ex-NOR & NOR using a minimum number of NAND gates. ii. Realize Ex-NOR & NAND using a minimum number of NOR gates.	C.O. - 02 C.O. - 01

Q.4 Long Answer: (Attempt **any Two** out of Three.) **(2 x 15 = 30)**

a.	Simplify the following boolean expression using K-Map and verify using Tabular method then implement using conventional logic gates. F(A,B,C,D) = ∑m (0,2,3,5,7,8,9,10,11,13,15)	C.O.–03
b.	Design BCD to Excess-3 code converter using basic gates.	C.O. – 02
c.	Define and design the BCD Counter.	C.O. - 04

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END SEMESTER EXAMINATION, JUNE- 2024

B. Tech. Semester - II

Course Name: Introduction to IT Verticals **Course Code: CST123**

Time allotted: 03 Hours **Max. Marks: 100**

Note: Read all the instructions carefully.

Q.1. Objectives Type

(Very short/ Short Answer, MCQ, One-liners, Fill in the Blank, True/ False) Attempt all. (10×2=20)

a	_____ enables the migration of the virtual image from one physical machine to another. a) visualization b) virtualization c) migration d) virtual transfer	CO2	PO1, PO2, PO3
b	Most of the cloud architectures are built on this type of architecture. a) skeleton b) grid c) linear d) template	CO3	PO3 PO4
c.	Saas stands for? a) Software as a service b) System Software and services c) Software as a system d) System as a service	CO5	PO4 PO3
d	What is Cyber Security? a) Cyber Security provides security against malware b) Cyber Security provides security against cyber-terrorists c) Cyber Security protects a system from cyber attacks d) All of the mentioned	CO5	PO4 PO5
e.	What does cyber security protect? a) Cyber security protects criminals b) Cyber security protects internet-connected systems c) Cyber security protects hackers d) None of the mentioned	CO5	PO4 PO5
f.	Which of the following is a component of cyber security? a) Internet Of Things b) AI c) Database d) Attacks	CO4	PO4 PO5
g	Saas stands for? a) Software as a service b) System Software and services c) Software as a system d) System as a service	CO2	PO2 PO3
h	_____ as a utility is a dream that dates from the beginning of the computing industry itself. a) Model b) Computing c) Software d) All of the mentioned	CO5	PO4 PO5
i.	_____ has many of the characteristics of what is now being called cloud computing. a) Internet b) Softwares c) Web Service d) All of the mentioned	CO1	PO1 PO2
j.	Which of the following is Cloud Platform by Amazon? a) Azure b) AWS c) Cloudera d) All of the mentioned	CO5	PO4 PO5

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Q.2. Short notes / Short Answer Type (Attempt any five out of Seven) **(5×4=20)**

a.	What is smart contract in block chain?	CO2	PO2	PO1,PO2,P
b.	What is big data analytics?	CO3	PO3	PO3 PO4
c.	What is Dev Ops?	CO5	PO5, PO6	PO4 PO3
d.	What is open source?	CO5	PO5, PO6	PO4 PO5
e.	What is cyber security?	CO5	PO5, PO6	PO4 PO5
f.	What is IoT?	CO4	PO5, PO6	PO4 PO5
g.	What is GNU Linux?	CO2	PO1, PO2	PO2 PO3

Q.3. Structured Question (Attempt any three out of four) **(3×10=30)**

a.	(i)What is a public cloud? (ii) Why do we need a hybrid cloud? (iii)What is "Artificial Intelligence and Artificial Intelligence Technique" ?	CO5 PO5, PO6
b.	(i), Describe the characteristics of IoT. (ii), Give the advantages of cloud computing (iii) Explain the role of things in IoT.	CO5 PO5, PO6
c.	(i)What are the challenges in open source? (ii) What are the types of cyber security? , (iii) what access control and auditing in cyber security?	CO4 PO5, PO6
d.	(i), Mention the applications of IoT. (ii), Identify any two advantages of distributed computing. (iii) Explain the major services used in cloud computing technology.	CO2 PO1, PO2

Q.4. Long Answer / Essay type (Attempt any two out of three) **(2×15=3**

a.	(i) Illustrate the generic block diagram of an IoT device and explain it briefly. (ii) Bring out the differences between private cloud and public cloud.	CO5 PO5, PO6
b.	(i) What are the characteristics of cloud architecture that separates it from traditional one? (ii) Describe various functional blocks of IoT.	CO4 PO5, PO6
c.	(i) Explain the role of Big data analysis in IoT and Define its Characteristics. (ii) Interpret the cloud resource pooling.	CO2 PO1, PO2

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Enrol. No. | S | R | H | U | | | | | | | | | Regn. No. | D | D | | | | | | | | |

END SEMESTER EXAMINATION, JUNE- 2024

B. Tech. Semester - II

Course Name: Software Engineering **Course Code: CST121**

Time allotted: 03 Hours **Max. Marks: 100**

Note: Read all the instructions carefully.

Q.1. Attempt all. **(10×2=20)**

a.	Define System Modeling.	CO2	PO2
b.	Write any two characteristics of software as a product.	CO1	PO1
c.	What are SDLC models available?	CO1	PO1
d.	What is verification and validation?	CO4	PO4
e.	What is feasibility study?	CO2	PO2
f.	Distinguish between alpha and beta testing?	CO4	PO3
g.	What is software metric?	CO5	PO1
h.	What is cohesion?	CO3	PO2
i.	What is Quality Assurance vs. Quality Control?	CO4	PO3
j.	What is software requirement?	CO2	PO2

Q.2. Attempt any five out of Seven. **(5×4=20)**

a.	Explain prototype model.	CO1	PO1
b.	Explain the design concept.	CO2	PO1
c.	Write a short note of SDLC.	CO1	PO1
d.	Discuss about the 3 golden rules of performing user interface design.	CO3	PO1
e.	Explain the CMMI.	CO1	PO1
f.	Define black box testing strategy?	CO4	PO3
g.	Explain UML	CO2	PO2

Q.3. Attempt any three out of four. **(3×10=30)**

a.	What is the role of software engineering in software development? Explain the software myths. Explain changing nature of software.	CO1	PO1
b.	EXPALIN THE FOLLOWING (i)Software Risk (ii) Risk Projection (iii) Risk Refinement	CO5	PO4
c.	Explain the following (i)Unit Testing (ii) Integration Testing (iii)System Testing	CO4	PO3
d.	Explain the Following (i)Context Model (ii)Data Model (iii)Object Model	CO2	PO2

Q.4. Attempt any two out of three. **(2×15=30)**

a.	(i) Differentiate between verification and validation testing. (ii) Explain the alpha and beta Testing.	CO4	PO4
b.	(i)What is system modeling and explain it. (ii)Explain SRS.	CO2	PO2
c.	(i)Define the prototype model. (ii) What is process model and explain the waterfall model.	CO1	PO1

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Enrol. No. | S | R | H | U | | | | | | | | | Regn. No. | D | D | | | | | | | | | |

END SEMESTER EXAMINATION, JUNE- 2024

B. Tech. Semester – II

Course Name: Mathematics II **Course Code: BST121**

Time allotted: 03 Hours **Max. Marks: 100**

Note: Read all the instructions carefully.

Q.1. Objectives Type **(10 X 2=20)**

(Very short/ Short Answer, MCQ, One-liners, Fill in the Blank, True/ False) Attempt all.

S.No.	Question	CO	PO
a.	A non-homogenous system of equations has a unique solution if	1	1
b.	Define an idempotent matrix.	1	2
c.	What is the dimension of the vector space $M_{2\times2}$ of all matrices of order 2×2.	2	1
d.	Let $T: U \to V$ be a linear transformation and $\dim(U) = \dim(V) = p$. If null space of T is the zero subspace then T^{-1} exists. **(True/False)**	3	2
e.	Define the Rank of a linear transformation $T: U \to V$.	3	2
f.	If two eigenvalues of matrix A are 3 and 0 then find the third eigenvalue of $A = \begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & 3 \end{bmatrix}$.	3	2
g.	Find the normalized vector for the vector $u = (-1, 5, 2)$.	4	1
h.	The rate of convergence of Newton-Raphson iterative method is quadratic. **(True/False)**	5	1
i.	Write the formula for Trapezoidal rule.	5	1
j.	What is the relation between shift operator and backward difference operator?	5	1

Q.2. Short notes / Short Answer Type (Attempt any five out of Seven) **(5 X 4=20)**

a.	Let V be a vector space of all polynomials. Determine whether the subset W consisting of all polynomials of degree less than equal to n is a subspace of V.	2	2
b.	Solve the following system of equations by applying elementary row operations $4x - y = 12$ $-x + 5y - 2z = 0$ $-2y + 4z = -8$.	1	2
c.	Find the inverse of the matrix $A = \begin{bmatrix} 1 & 1 & 0 \\ 1 & -1 & 1 \\ 1 & -1 & 2 \end{bmatrix}$ by applying elementary ro operations.	1	1
d.	Check whether the following subset S of V_4 is linearly dependent $S = \{(1, -1, 2, 0), (1, 1, 2, 0), (3, 0, 0, 1), (2, 1, -1, 0)\}$.	2	2

e.	Show that: $e^x = (\frac{\Delta^2}{E})e^x \frac{Ee^x}{\Delta^2 e^x}$, where E is the shift operator and Δ is the forward differential operator.	5	1
f.	Find the cubic polynomial which takes the following values x: 0, 1, 2, 3 f(x): 1, 2, 1, 10	5	1
g.	Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using Trapezoidal rule with $h = 0.2$.	5	2

Q.3. Structured Question (Attempt any three out of four) **(3 X 10=30)**

a.	Verify Cayley-Hamilton theorem for the following matrix and hence find the inverse of the matrix $A = \begin{bmatrix} 1 & 2 \\ 2 & -1 \end{bmatrix}$.	3	2
b.	(i) Let $S=(x^3, x^2+2x, x^2+2, 1-x)$. Determine whether the polynomial x^4+7x+2 is in the span of S i. e. is in $[S]$. (ii) Extend the set {(3, -1, 2)} to form the basis of V_3.	2 2	2 2
c.	(i) Apply Gram-Schmidt process to the vectors {(1, -1, 0), (2, -1, -2), (1, -1, -2)} of V_3 to obtain an orthonormal basis for V_3. (8) (ii) Define algebraic and geometric multiplicity of eigenvalues. (2)	4 3	2 1
d.	(i) Using Runge-Kutta method find y(0.7) given that $\frac{dy}{dx} = y - x^2, y(0.6) = 1.7379$. Take $h = 0.1$. (5) (ii) Find a root of the equation $e^x - 4x = 0$ using Newton-Raphson method correct up to three places of decimals. (5)	5	2

Q.4. Long Answer / Essay type (Attempt any two out of three) **(2 X 15=30)**

a.	(i) Find the model matrix P which diagonalizes the following matrix A and hence diagonalize the matrix A $A = \begin{bmatrix} 5 & 3 \\ 3 & 5 \end{bmatrix}$. (ii) In a vector space V show that for all $u \in V$, $(-1)u = -u$	3	2
b.	(i) Investigate whether the linear transformation $T: V_3 \to V_3$ defined below is nonsingular $T(e_1)=e_1+e_2, T(e_2)=e_3+e_2, T(e_3)=e_1+e_2+e_3$. (9) (ii) Extend the set S = {(4, -2, 2)} to form the basis of V_3. (6)	3 2	2 1
c.	(i)) Find a root of the equation $3x + \sin x = e^x$ using iteration method. (5) (ii) Find $\frac{dy}{dx}$ at x = 1.1 from the following table (5) x: 1, 1.1, 1.2, 1.3, 1.4 y: 43.1, 47.7, 52.1, 56.4, 60.8 (iii) Apply two iterations of Gauss-Seidel method to solve the following system of linear equations (5) $27x + 6y - z = 85$ $6x + 15y + 2z = 72$ $x + y + 54z = 110$.	5	2 2 2

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