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**END SEMESTER EXAMINATION, DECEMBER - 2024**  
**B. Tech. Semester – I**

**Course Name: Environmental Studies****Course Code: HST112****Max. Marks: 100****Time allotted: 03 Hours****Note: Read all the instructions carefully.****Q.1. Very short answer questions: Attempt all.****(10×2=20)**

| QN | Questions                                                                                          | CO | PO |
|----|----------------------------------------------------------------------------------------------------|----|----|
| a. | Define lapse rate in atmosphere.                                                                   | 2  | 7  |
| b. | Give an example of edaphic factor of an ecosystem.                                                 | 2  | 7  |
| c. | Flow of energy in an ecosystem is cyclic. (True/False)                                             | 2  | 7  |
| d. | The advancement of an ecological community with time is called ecological succession. (True/False) | 1  | 7  |
| e. | Geothermal energy is an example of renewable source of energy. (True/False)                        | 3  | 7  |
| f. | Decibel (dB) is used to measure _____.                                                             | 2  | 7  |
| g. | Give two examples of secondary air pollutant.                                                      | 2  | 7  |
| h. | Define rehabilitation.                                                                             | 1  | 7  |
| i. | Acid rain causes corrosion of material. (True/False)                                               | 2  | 12 |
| j. | Air Pollution control act was enacted in 1986. (True/False)                                        | 2  | 12 |

**Q.2. Short Answer Questions: (Attempt any five)****(5×4=20)**

| QN | Questions                                            | CO | PO |
|----|------------------------------------------------------|----|----|
| a. | Explain the vertical structure of atmosphere.        | 2  | 7  |
| b. | Write any four characteristics of aquatic ecosystem. | 1  | 7  |
| c. | What are different types of forest?                  | 1  | 7  |
| d. | Brief the anthropogenic causes of biodiversity loss. | 2  | 12 |
| e. | Write a short note on nuclear hazards.               | 4  | 7  |
| f. | Brief the consequences of ozone layer depletion.     | 4  | 12 |
| g. | What are the causes of overpopulation?               | 2  | 12 |

**Q.3. Structured Question: (Attempt any three)****(3×10=30)**

| QN | Questions                                                | CO | PO |
|----|----------------------------------------------------------|----|----|
| a. | Discuss the significance of sustainable development.     | 4  | 10 |
| b. | Describe the process of ecological succession in detail. | 1  | 7  |
| c. | Explain the process of rain water harvesting.            | 2  | 12 |
| d. | Brief values and services of biodiversity.               | 1  | 12 |

**Q.4. Long Answer/Essay type Questions: (Attempt any two)****(2×15=30)**

| QN | Questions                                                                             | CO | PO |
|----|---------------------------------------------------------------------------------------|----|----|
| a. | Explain the concept of carbon footprint. How it can be minimized at individual level? | 3  | 3  |
| b. | Discuss the causes and effects of climate change. How it can be minimized?            | 2  | 7  |
| c. | Explain your experience with reference to environmental field visit.                  | 3  | 12 |

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## END SEMESTER EXAMINATION, DECEMBER - 2024

## B. Tech. Semester - I

Course Name: Mathematics-I

Course Code: BST111

Time allotted: 03 Hours

Max. Marks: 100

Note: Read all the instructions carefully.

(10 X 2=20)

## Q.1.Objectives Type

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

| QN | Questions                                                                                                      | CO | PO |
|----|----------------------------------------------------------------------------------------------------------------|----|----|
| a. | State Leibnitz's theorem for successive differentiation.                                                       | 1  | 1  |
| b. | How is a Jacobian defined for two variables?                                                                   | 1  | 2  |
| c. | Convert $f(x, y)dxdy$ into polar coordinates.                                                                  | 2  | 2  |
| d. | How can double integrals be used to calculate the area of a region?                                            | 2  | 2  |
| e. | Write the formula for a unit tangent vector.                                                                   | 3  | 1  |
| f. | Define the divergence of a vector field.                                                                       | 3  | 1  |
| g. | Write the formula for the line integral of a vector field.                                                     | 4  | 1  |
| h. | Define a surface integral.                                                                                     | 4  | 1  |
| i. | State the general solution of a linear first-order differential equation.                                      | 5  | 1  |
| j. | What is the characteristic equation of a second-order linear differential equation with constant coefficients? | 5  | 1  |

## Q.2. Short notes / Short Answer Type (Attempt any five out of Seven)

(5 X 4=20)

| QN | Questions                                                                                                                                                       | CO | PO |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| a. | Find the $n^{\text{th}}$ differential coefficient of $x^3 \sin x$ using Leibnitz rule.                                                                          | 1  | 2  |
| b. | Expand $(1+x)^n$ using Maclaurin's series in ascending powers of $x$ .                                                                                          | 1  | 2  |
| c. | Check the function for continuity $f(x) = \begin{cases} \frac{x^3 y^3}{x^3 + y^3}; x \neq 0, y \neq 0 \\ 0; x = 0, y = 0 \end{cases}$ at the origin.            | 1  | 2  |
| d. | Find the Extremum of the function $f(x, y) = 2 + 2x + 2y - x^2 - y^2$ .                                                                                         | 1  | 2  |
| e. | If $u = x + y - z$ , $v = x - y + z$ , $w = x^2 + y^2 + z^2 - 2yz$ , determine whether there is a functional relationship between $u, v, w$ and if so, find it. | 1  | 2  |
| f. | Change the order of integration $\int_0^1 \int_{x^2}^x f(x, y) dy dx$ .                                                                                         | 2  | 2  |
| g. | Change into polar coordinates $\int_0^2 \int_0^{\sqrt{2x-x^2}} \frac{xdydx}{\sqrt{x^2+y^2}}$ , R is positive quadrant of the circle $x^2 + y^2 = 1$ .           | 2  | 2  |

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## Q.3. Structured Question (Attempt any three out of four)

(3 X 10=30)

| QN | Questions                                                                                                                                                                                                                           | CO | PO |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| a. | Find the volume generated by revolving the area between the curve $y = \sqrt{2x - x^2}$ and $x$ -axis around $x$ axis.                                                                                                              | 2  | 2  |
| b. | Find the directional derivative of $\text{div}(\vec{u})$ , where $\vec{u} = x^3\hat{i} + y^3\hat{j} + z^3\hat{k}$ at the point $(2, 1, -3)$ in the direction of the normal of the sphere $xy^2 + y^2z + z^2x = 2$ .                 | 3  | 2  |
| c. | Find the scalar potential function $f$ for $\vec{F} = y^2\hat{i} + 2xy\hat{j} - z^2\hat{k}$ .                                                                                                                                       | 3  | 2  |
| d. | Use Gauss Divergence Theorem to evaluate $\iiint_S \vec{F} \cdot \hat{n} ds$ where $\vec{F} = (2x + 3z)\hat{i} - (xz + y)\hat{j} + (y^2 + 2z)\hat{k}$ and $S$ is the surface of the sphere having centre $(3, -1, 2)$ and radius 3. | 4  | 2  |

## Q.4. Long Answer / Essay type (Attempt any two out of three)

(2 X 15=30)

| QN | Questions                                                                                                                                                                           | CO | PO |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|
| a. | Verify Stoke's Theorem for the function $\vec{F} = x^2\hat{i} - xy\hat{j}$ integrated round the square in the plane $z = 0$ and bounded by the lines $x = 0, y = 0, x = a, y = a$ . | 4  | 2  |
| b. | (i) Solve $(x \sec^2 y - x^2 \cos y) dy = (\tan y - 3x^4) dx$<br>(ii) Solve $dy + y \tan x \cdot dx = y^2 \sec x \cdot dx$                                                          | 5  | 2  |
| c. | Solve $(D^2 + 5D + 6) y = e^{-2x} \sec^2 x (1 + 2 \tan x)$                                                                                                                          | 5  | 2  |

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**END SEMESTER EXAMINATION, DECEMBER - 2024****B. Tech. Semester - I****Course Name: Basic Electronic Engineering****Course Code: BST112**

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. | Draw the symbols of Schottky & PIN diode.                       | C.O. – 03 |
| b. | Draw the voltage doubler circuit.                               | C.O. – 02 |
| c. | Why do we need to filter?                                       | C.O. – 03 |
| d. | What is Rectification?                                          | C.O. – 02 |
| e. | What is the significance of Fermi level in Energy band diagram? | C.O. – 01 |
| f. | What is mass-action law?                                        | C.O. – 01 |
| g. | What is White noise?                                            | C.O. – 04 |
| h. | What is Bandwidth?                                              | C.O. – 05 |
| i. | What is large signal current gain? Give its formula.            | C.O. – 04 |
| j. | What is voltage gain? Give its formula.                         | C.O. – 05 |

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

|    |                                                                                |           |
|----|--------------------------------------------------------------------------------|-----------|
| a. | Explain the Zener breakdown.                                                   | C.O. – 03 |
| b. | Draw the transfer characteristics of shunt positive clipper and comment on it. | C.O. – 04 |
| c. | Write the values of electron & hole mobilities of Si & Ge.                     | C.O. – 02 |
| d. | List the Ideal characteristics of Op-amp.                                      | C.O. – 05 |
| e. | Draw & explain the crystal structure of silicon with a broken covalent bond.   | C.O. – 02 |
| f. | List all the transistor current components and explain them.                   | C.O. – 04 |
| g. | Write about negative resistance region and the devices in which it is found.   | C.O. – 01 |

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

|    |                                                                                                                                                 |                        |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| a. | Explain the Enhancement mode MOSFET working principle with neat diagrams.                                                                       | C.O. – 04              |
| b. | i. Explain the Hall effect and derive the expressions for $V_H$ & $R_H$ .<br>ii. Explain the working principle of different passive components. | C.O. – 01<br>P.O. – 01 |
| c. | i. Explain the working principle of Varactor diode.<br>ii. Explain the working principle of PIN diode.                                          | C.O. – 03<br>P.O. – 03 |
| d. | i. Draw the input & output waveforms of Half-wave rectifier and explain them.<br>ii. List and explain different types of amplifiers.            | C.O. – 02<br>C.O. – 05 |

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

|    |                                                                                                                                              |                        |
|----|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| a. | i. List and explain different types of tuned amplifiers.<br>ii. Draw the input & output waveforms of Bridge-FWR and explain them.            | C.O. – 05<br>C.O. – 04 |
| b. | i. List and explain different types of power amplifiers.<br>ii. Draw and explain the BJT-CE input & output characteristics.                  | C.O. – 03<br>P.O. – 02 |
| c. | Draw and explain the characteristics of Tunnel diode with the help of energy band diagrams in detail for both forward bias and reverse bias. | C.O. – 03              |

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Date 02.01.2028

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## END SEMESTER EXAMINATION, DECEMBER - 2024

B. Tech. Semester - I

Course Name: English-I

Course Code: HS111T

Max. Marks: 100

Time allotted: 03 Hours

Note: Read all the instructions carefully.

Q.1 VERY SHORT ANSWER QUESTIONS – Attempt All.

(2x10 = 20 Marks)

- a. Define extensive reading. CO1
- b. Describe reflective response. CO1
- c. What is inferring? CO1
- d. What is Stress in spoken English? CO1
- e. Delineate word-stress. CO1
- f. Write antonym of given words. (a). Adversity (b). Brutal CO2
- g. Write synonyms of given words. (a). Blunder (b). Combat CO2
- h. Use appropriate article with given words. (a). Umbrella (b). University CO2
- i. **Convert to Past indefinite tense:** CO2  
He has never understood them.
- j. Use appropriate preposition: CO2  
1. She is allergic \_\_\_ cat. (with/ to)  
2. He is afraid \_\_\_ heights. (to/ of)

Q.2 SHORT ANSWER QUESTIONS – Attempt any Five.

(4x5 = 20 Marks)

- a. Define the importance of good listening skills in academic and professional sphere. CO3
- b. Define the term “reading comprehension” in the context of language learning. Provide a brief explanation of its importance in effective language learning. CO3
- c. What do you understand by specific information? CO3
- d. Delineate intonation. CO3
- e. Suggest three practical methods for improving one’s writing skills. Explain how each method can contribute to becoming a more effective in writing. CO3
- f. Relate the connection between active listening and reflective response. CO4
- g. What is Evaluation in listening process? Explain. CO4

Q.3 STRUCTURED QUESTIONS – Attempt any Three.

(3\*10 = 30 Marks)

- a. Examine the importance of different types of intonation and analyze how each type contributes to overall speaking skills. CO4
- b. Examine the significance of discussion and discourse in improving speaking skills and analyze how these contribute to a better thought orientation and critical thinking. Provide examples to support your analysis. CO4
- c. Evaluate the importance of the various speaking skills in effective communication. CO5
- d. Evaluate how the knowledge of phonetics contributes to become a good speaker. CO5

Q.4 Case Analysis/ Situation Based QUESTIONS – Attempt any Two.

(2\*15 = 30 Marks)

- a. Write a paragraph describing an event, ensuring a logical progression of details. CO5
- b. Write a descriptive paragraph about your favorite place, utilizing vivid imagery and sensory details. CO6
- c. Write the body of a formal letter expressing gratitude for a scholarship, focusing on clarity and conciseness. CO6

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**END SEMESTER EXAMINATION, DECEMBER - 2024****B. Tech. Semester - I****Course Name: Fundamental of Computer & IT****Course Code: CST111****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)**

|                                                                                                           | CO | PO |
|-----------------------------------------------------------------------------------------------------------|----|----|
| a. Write a name of known as the father of modern digital computers.                                       | 1  | 1  |
| b. List out the key hardware technologies used in building the computers of each of the five generations. | 1  | 1  |
| c. Explain the Web browser and URL.                                                                       | 4  | 1  |
| d. Define search engines and give the names of the two most popular search engines.                       | 4  | 1  |
| e. Define the terms Hardware and Software.                                                                | 1  | 1  |
| f. Differentiate between Hub and Repeater.                                                                | 4  | 1  |
| g. Compare between a Bridge and a Switch.                                                                 | 4  | 2  |
| h. List out the names of four popular operating systems.                                                  | 3  | 1  |
| i. Explain star topology.                                                                                 | 4  | 1  |
| j. Differentiate between Hub and Switch.                                                                  | 4  | 2  |

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

|                                                                                                                                    |   |   |
|------------------------------------------------------------------------------------------------------------------------------------|---|---|
| a. Explain Router. Write down the functions performed by the router.                                                               | 4 | 2 |
| b. List out and explain some of the important characteristics of a computer.                                                       | 1 | 1 |
| c. Draw a block diagram to illustrate the basic organization of a computer system, and explain the functions of the various units. | 1 | 1 |
| d. Define base of a number system, and also mention a value of a base for decimal, hexadecimal, binary and octal number systems.   | 2 | 2 |
| e. Write short note on DOS.                                                                                                        | 2 | 1 |
| f. Explain MS Windows, and how is it different from MS-DOS.                                                                        | 2 | 2 |
| g. Differentiate between Simplex, half duplex and full duplex modes of data transmission.                                          | 4 | 2 |

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

|    |                                                                                                        |   |   |
|----|--------------------------------------------------------------------------------------------------------|---|---|
| a. | (i) Discuss network topology, in brief                                                                 | 4 | 1 |
|    | (ii) Mention the purpose of an output device, and explain plotter and projector as the output devices. |   |   |
| b. | (i) Write down the five basic operations performed by any computer system.                             | 1 | 1 |
|    | (ii) Differentiate between the primary and secondary memory of a computer system.                      |   |   |
| c. | (i) Draw a basic block diagram of a computer system and explain the function(s) of each unit.          | 2 | 2 |
|    | (ii) Define microprocessor, and how did it revolutionize the computer industry?                        |   |   |
| d. | (i) Define electronic mail (e-mail), and write the procedure of sending and receiving the emails.      | 4 | 1 |
|    | (ii) Differentiate among RAM, ROM, PROM and EPROM.                                                     |   |   |

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

|    |                                                 |   |   |
|----|-------------------------------------------------|---|---|
| a. | Convert the following Number System:            | 1 | 2 |
|    | (i) $(764.65)_8 = ?_{10}$                       |   |   |
|    | (ii) $31_9 = ?_3$                               |   |   |
|    | (iii) $(F4.24)_{16} = ?_{10}$                   |   |   |
| b. | (i) Explain HTTP and HTTPS protocols in detail. | 4 | 1 |
|    | (ii) Compare between TCP and UDP.               |   |   |
| c. | (i) Explain MAC addressing in detail.           | 5 | 2 |
|    | (ii) Explain IP addressing in detail.           |   |   |

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**END SEMESTER EXAMINATION, DECEMBER - 2024****B. Tech. Semester - I****Course Name: Programming for Problem Solving****Course Code: CST112****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. | What are the advantages of structure in C?                             | 4  | 1  |
| b. | Define algorithm.                                                      | 1  | 1  |
| c. | Differentiate compile time initialization and run time initialization. | 2  | 1  |
| d. | Define the role of preprocessor directives?                            | 4  | 1  |
| e. | What are the advantages of arrays in C?                                | 3  | 1  |
| f. | How will you declare a variable as constant in C?                      | 2  | 1  |
| g. | What are actual and formal parameters?                                 | 3  | 1  |
| h. | What is the use of operators in C?                                     | 2  | 1  |
| i. | Define macros.                                                         | 4  | 1  |
| j. | Explain <b>break</b> and <b>continue</b> statement.                    | 2  | 1  |

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

| QN | Questions                                                                   | CO | PO          |
|----|-----------------------------------------------------------------------------|----|-------------|
| a. | What is function declaration? Explain with proper syntax and example.       | 3  | 1,2         |
| b. | Write an algorithm to check whether a given year is leap year or not.       | 1  | 1,2,3       |
| c. | What is array? Write a program to print the sum of array elements.          | 3  | 1,2,3<br>,5 |
| d. | Draw a flow chart to check whether a given number is even or odd.           | 1  | 1,2,3<br>,5 |
| e. | Explain the syntax of <b>fseek()</b> , <b>ftell()</b> and <b>rewind()</b> . | 5  | 1,2,3       |
| f. | What is flow chart? Explain all the notations of flow chart.                | 1  | 1           |
| g. | What is translator? Differentiate compiler and interpreter.                 | 1  | 1           |

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