



| SECTION-B |                                                                                                                                                                                           |      |    |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| 2.        | Examine Fourier transform of unit step signal $u(t)$ .                                                                                                                                    | CO-1 | L4 |
| 3.        | Inspect singularity functions through Laplace transform.                                                                                                                                  | CO-2 | L4 |
| 4.        | Design a low pass filter of cut off frequency of 2.5 KHz and design impedance of 700 Ohm. Also evaluate the frequency at which filter introduces attenuation of 19.1 dB.                  | CO-3 | L6 |
| 5.        | Examine the positive realness of the following network function:<br>$Z(s) = \frac{s^3 + 5s^2 + 9s + 3}{s^3 + 4s^2 + 7s + 9}$                                                              | CO-4 | L4 |
| 6.        | Evaluate Current Transfer function $I(S) = 5S/(S+2) (S^2 + 2S+2)$ . Obtain its Time Domain Response and check its stability.                                                              | CO-5 | L5 |
| SECTION-C |                                                                                                                                                                                           |      |    |
| 7.        | State and prove maximum power transfer theorem for ac circuit. Derive the value of maximum power at load.                                                                                 | CO-1 | L4 |
| 8.        | Interpret the relation between Z and Y parameters for a two port network.                                                                                                                 | CO-3 | L5 |
| 9.        | The driving point impedance of a one port LC network is given by<br>$Z(S) = \frac{2(S^2 + 9)(S^2 + 16)}{S(S^2 + 4)}$<br>Determine the first and second Foster form of equivalent network. | CO-4 | L5 |

**Note:** Disclosure of identity by writing mobile number or making of passing request on any paper of Answer Sheet will lead to UMC against the student.

Roll No. 

Date: 23-05-2026

Total No. of Questions: 9

Total No. of Pages: 2

B.TECH.(ECE), Semester-3rd

DIGITAL SYSTEM DESIGN

Subject Code: BTEC-302-18

M.Code:76445

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q No.     | Description                                                                                                                                            | CO   | BL |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| Section A |                                                                                                                                                        |      |    |
| 1         | Answer Briefly:                                                                                                                                        |      |    |
| a         | What are universal gates and state why they are called "universal"?                                                                                    | CO-1 | L1 |
| b         | Convert the given Boolean expression to canonical SOP form:<br>$F = A + BE + AC'D$                                                                     | CO-1 | L2 |
| c         | What is the function of Strobe pin in Multiplexers?                                                                                                    | CO-2 | L1 |
| d         | Compare Serial and parallel adders.                                                                                                                    | CO-2 | L2 |
| e         | What is the function of the "master" in a master-slave J-K flip-flop?                                                                                  | CO-3 | L1 |
| f         | Differentiate between ripple counter and synchronous counter.                                                                                          | CO-3 | L2 |
| g         | List the advantages of a dual-slope ADC.                                                                                                               | CO-4 | L1 |
| h         | Write VHDL code line to implement D flip-flop behavior.                                                                                                | CO-5 | L2 |
| i         | What is the use of the process statement in VHDL?                                                                                                      | CO-5 | L1 |
| j         | Explain Behavioral Modeling in VHDL.                                                                                                                   | CO-5 | L2 |
| Section B |                                                                                                                                                        |      |    |
| 2         | Make use of K-Map to minimize the following Boolean function<br>$F(A,B,C,D) = \sum m(0,2,5,7,8,10,13,15)$ and design the circuit using NAND gate only. | CO-1 | L3 |
| 3         | Design circuit corresponding to the following Boolean expression using 8:1 Multiplexer<br>$F(A,B,C,D) = \sum m(0, 3, 4, 7, 8, 10, 12, 14)$             | CO-2 | L3 |

| Q No.            | Description                                                                                                                                                        | CO   | BL |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| 4                | Convert J-K Flip Flop to T-type Flip-Flop.                                                                                                                         | CO-3 | L5 |
| 5                | Compare TTL, ECL, and CMOS in terms of speed, power dissipation, noise margin and fan-out.                                                                         | CO-4 | L4 |
| 6                | Design a 4-bit up-counter using behavioural VHDL.                                                                                                                  | CO-5 | L4 |
| <b>Section C</b> |                                                                                                                                                                    |      |    |
| 7                | a) Design the combinational circuits of Full Subtractor and Half Subtractor using DEMUX.<br><br>b) Design the circuit of 4 X 2 Priority Encoder using logic gates. | CO-1 | L6 |
| 8                | Analyze the race-around condition in J-K Flip-Flops. How does the Master-Slave configuration solve this issue?                                                     | CO-3 | L4 |
| 9                | a) Explain the working of Successive approximation type A to D Converter using block diagram.<br><br>b) Implement NAND Gate using TTL Logic.                       | CO-4 | L5 |

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**Roll No.**

**Total No. of Pages: 02**

**Total No. of Questions: 09**

**B.Tech (ECE), Semester- 3<sup>rd</sup>**

### MATHEMATICS - III

**Subject Code: BTAM-303-18**

**M.Code: 76448**

**Date of Examination:** 29-05-2025

**Time: 3 Hrs.**

**Max. Marks: 60**

**INSTRUCTIONS TO CANDIDATES:**

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying two marks each.
2. SECTION-B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. SECTION C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

| Q. No.           | Question                                                                                                                                 | Course Outcome | Bloom's Level |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------|
| <b>SECTION-A</b> |                                                                                                                                          |                |               |
| 1.               | Answer briefly:                                                                                                                          |                |               |
| a.               | The mean of the binomial distribution is 20 and standard deviation is 4. Find its distribution.                                          | CO5            | L1            |
| b.               | What is the Laplace transform of <i>sint</i> ?                                                                                           | CO1            | L1            |
| c.               | Interpret Fourier sine transform of $\frac{1}{x}$ .                                                                                      | CO2            | L2            |
| d.               | Find $a_n$ if $f(x) = x^3$ , where $x \in (-2, 2)$ .                                                                                     | CO2            | L1            |
| e.               | Outline Second Shifting Property of Laplace transform.                                                                                   | CO1            | L2            |
| f.               | Explain the method to fit parabola.                                                                                                      | CO6            | L2            |
| g.               | Find the Z transform of $\frac{1}{n!}, n > 0$ .                                                                                          | CO3            | L1            |
| h.               | If X is Poisson variable with $P(X = 1) = \frac{1}{2}P(X = 2)$ Find mean and variance.                                                   | CO5            | L1            |
| i.               | The probability that a student passes a mathematics exam is 0.6. What is the probability that exactly 2 out of 5 students pass the exam? | CO4            | L1            |
| j.               | Outline Final Value Theorem for Z transforms.                                                                                            | CO3            | L2            |



| SECTION-B |                                                                                                                                                                                                                                  |     |    |   |   |   |   |   |    |    |    |   |   |     |    |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|---|---|---|---|---|----|----|----|---|---|-----|----|
| 2.        | Solve $L^{-1}\left(\frac{s-2}{s(s+2)(s-1)}\right)$ .                                                                                                                                                                             | CO1 | L3 |   |   |   |   |   |    |    |    |   |   |     |    |
| 3.        | Simplify $Z\{\sin(n+1)\theta\}$ .                                                                                                                                                                                                | CO3 | L4 |   |   |   |   |   |    |    |    |   |   |     |    |
| 4.        | A factory manufactures light bulbs with a defect rate of 3%. If a random sample of 10 bulbs is tested, Determine the probability that exactly 1 bulb is defective? Use the binomial distribution.                                | CO5 | L5 |   |   |   |   |   |    |    |    |   |   |     |    |
| 5.        | Using the Z -transform, Simplify :<br>$u_{n+2} + 4u_{n+1} + 3u_n = 3^n$<br>with $u_0 = 0, u_1 = 1$ .                                                                                                                             | CO4 | L4 |   |   |   |   |   |    |    |    |   |   |     |    |
| 6.        | Relate $f(x) = \begin{cases} 1, & 0 \leq x \leq \pi \\ 0, & x > \pi \end{cases}$ as a Fourier sine integral.                                                                                                                     | CO2 | L4 |   |   |   |   |   |    |    |    |   |   |     |    |
| SECTION-C |                                                                                                                                                                                                                                  |     |    |   |   |   |   |   |    |    |    |   |   |     |    |
| 7.        | Simplify y from the differential equation<br>$y'' - 3y' + 2y = 4e^{2t}$<br>With $y(0) = -3$ and $y'(0) = 5$ using transformations .                                                                                              | CO1 | L4 |   |   |   |   |   |    |    |    |   |   |     |    |
| 8.        | Measure a Poisson distribution to the following data:<br><table border="1"><tr><td>X</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>f</td><td>46</td><td>38</td><td>22</td><td>9</td><td>1</td></tr></table> | X   | 0  | 1 | 2 | 3 | 4 | f | 46 | 38 | 22 | 9 | 1 | CO5 | L5 |
| X         | 0                                                                                                                                                                                                                                | 1   | 2  | 3 | 4 |   |   |   |    |    |    |   |   |     |    |
| f         | 46                                                                                                                                                                                                                               | 38  | 22 | 9 | 1 |   |   |   |    |    |    |   |   |     |    |
| 9.        | Interpret $e^{2x}$ as a Fourier Series in the interval $[0, 2\pi]$ .                                                                                                                                                             | CO2 | L5 |   |   |   |   |   |    |    |    |   |   |     |    |

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**Total No. of Pages:02**

**Total No. of Questions: 09**

**B.Tech (ECE), Semester 3<sup>rd</sup>**  
**MATHEMATICS-III**  
**(INTEGRAL TRANSFORMS, PROBABILITY AND STATISTICS)**

**Subject Code: BTAM-303-23**

**M. Code: 94631**

**Date of Examination:** 29/5-2025

**Time: 3 Hrs.****Max. Marks: 60**

### INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q. No.           | Question                                                                                                                                                       | Course Outcome | Bloom's Level |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------|
| <b>SECTION-A</b> |                                                                                                                                                                |                |               |
| 1.               | Answer briefly:                                                                                                                                                |                |               |
| a.               | What is the Laplace Transform of the Dirac – delta function ?                                                                                                  | CO-1           | L1            |
| b.               | Interpret the Laplace Transform of the function : $f(t) = \frac{\sin t}{t}$                                                                                    | CO-1           | L2            |
| c.               | Find Fourier Cosine Transform of the function : $f(x) = e^{-5x}$                                                                                               | CO-2           | L1            |
| d.               | Explain the Gibbs Phenomenon.                                                                                                                                  | CO-2           | L2            |
| e.               | Find the Z transform of the sequence : $y[k] = \frac{1}{k!}, k > 0$                                                                                            | CO-3           | L1            |
| f.               | Outline the mathematical expression of Final Value theorem for Z transform .                                                                                   | CO-3           | L2            |
| g.               | A speaks the truth in 60% and B in 75% of the cases. Interpret in what percentage of cases are they likely to contradict each other in stating the same fact ? | CO-4           | L2            |
| h.               | List any four properties of Normal distribution .                                                                                                              | CO-5           | L1            |
| i.               | What are the normal equations to fit an exponential curve:<br>$y = ae^{bx}$ ?                                                                                  | CO-6           | L1            |
| j.               | List any two advantages of Curve Fitting.                                                                                                                      | CO-6           | L1            |
| <b>SECTION-B</b> |                                                                                                                                                                |                |               |
| 2.               | Solve the given inverse transformation : $L^{-1} \left( \log \frac{s+1}{s-1} \right)$                                                                          | CO-1           | L3            |
| 3.               | Analyze the Fourier Series of the function:<br>$f(x) = x + x^2, x \in (-\pi, \pi)$                                                                             | CO-2           | L4            |

|           |                                                                                                                                                                                                                                                                                                                                                                  |      |    |    |    |   |   |   |   |    |    |      |    |    |   |      |    |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|----|----|---|---|---|---|----|----|------|----|----|---|------|----|
| 4.        | Interpret the sequence corresponding to given function using Z transformation : $X(z) = \frac{3z^2+2z}{z^2-3z+2}$                                                                                                                                                                                                                                                | CO-3 | L5 |    |    |   |   |   |   |    |    |      |    |    |   |      |    |
| 5.        | The marks obtained by 25 students in a test are given as : 12, 15, 20, 18, 15, 12, 20, 22, 25, 15, 18, 20, 25, 15, 12, 18, 20, 22, 25, 15, 18, 12, 20, 22, 25. Determine the mean, median and mode .                                                                                                                                                             | CO-4 | L5 |    |    |   |   |   |   |    |    |      |    |    |   |      |    |
| 6.        | Identify the linear curve for the data:<br><table border="1"><tr><td>X</td><td>2</td><td>4</td><td>6</td><td>8</td></tr><tr><td>Y</td><td>3</td><td>7</td><td>11</td><td>15</td></tr></table>                                                                                                                                                                    | X    | 2  | 4  | 6  | 8 | Y | 3 | 7 | 11 | 15 | CO-6 | L3 |    |   |      |    |
| X         | 2                                                                                                                                                                                                                                                                                                                                                                | 4    | 6  | 8  |    |   |   |   |   |    |    |      |    |    |   |      |    |
| Y         | 3                                                                                                                                                                                                                                                                                                                                                                | 7    | 11 | 15 |    |   |   |   |   |    |    |      |    |    |   |      |    |
| SECTION-C |                                                                                                                                                                                                                                                                                                                                                                  |      |    |    |    |   |   |   |   |    |    |      |    |    |   |      |    |
| 7.        | Solve the differential equation using Laplace Transformation.<br>$y'' + 3y' + 2y = e^{-t}$ , $y(0) = 1$ , $y'(0) = 0$                                                                                                                                                                                                                                            | CO-1 | L3 |    |    |   |   |   |   |    |    |      |    |    |   |      |    |
| 8.        | Determine the mean and standard deviation for the random variable X which has the probability density function :<br>$f(x) = \begin{cases} kx(2-x) , & 0 \leq x \leq 2 \\ 0, & \text{otherwise} \end{cases}$                                                                                                                                                      | CO-4 | L5 |    |    |   |   |   |   |    |    |      |    |    |   |      |    |
| 9.        | (a) Estimate the frequency by fitting Binomial distribution to the data:<br><table border="1"><tr><td>X</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>f</td><td>2</td><td>14</td><td>20</td><td>34</td><td>22</td><td>8</td></tr></table><br>(b) Prove that the Poisson distribution is a limiting case of Binomial distribution. | X    | 0  | 1  | 2  | 3 | 4 | 5 | f | 2  | 14 | 20   | 34 | 22 | 8 | CO-5 | L5 |
| X         | 0                                                                                                                                                                                                                                                                                                                                                                | 1    | 2  | 3  | 4  | 5 |   |   |   |    |    |      |    |    |   |      |    |
| f         | 2                                                                                                                                                                                                                                                                                                                                                                | 14   | 20 | 34 | 22 | 8 |   |   |   |    |    |      |    |    |   |      |    |

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Roll No.

**Total No. of Pages: 02**

**Total No. of Questions: 09**

**B.Tech (ECE), Semester-3<sup>rd</sup>**

## FOUNDATIONAL COURSE IN HUMANITIES (PHILOSOPHY)

**Subject Code: HSMC102-18**

**M.Code: 77082**

Date of Examination: 01-06-2025

**Time: 3 Hrs.**

**Max. Marks: 60**

### INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q. No.           | Question                                                                                         | Course Outcome | Bloom's Level |
|------------------|--------------------------------------------------------------------------------------------------|----------------|---------------|
| <b>SECTION-A</b> |                                                                                                  |                |               |
| 1.               | Answer briefly:                                                                                  |                |               |
| a.               | Who was Pythagoras? Describe his contributions.                                                  | CO-1           | L1            |
| b.               | How would you explain the main difference between Vidya and Avidya in simple words?              | CO-1           | L2            |
| c.               | Indicate the significance of Shanti Mantra in Sikshavalli                                        | CO-2           | L1            |
| d.               | Summarize the central question of Nasadiya Sukta.                                                | CO-2           | L2            |
| e.               | State how knowledge and invention are related.                                                   | CO-3           | L1            |
| f.               | Summarize Knowledge about Society.                                                               | CO-3           | L2            |
| g.               | Recall a situation where you followed an ethical rule.                                           | CO-4           | L1            |
| h.               | Summarize the modern definition of creativity.                                                   | CO-4           | L2            |
| i.               | Outline Prayojna and Prasanga.                                                                   | CO-5           | L1            |
| j.               | Summarize Vyasa Philosophy.                                                                      | CO-5           | L2            |
| <b>SECTION-B</b> |                                                                                                  |                |               |
| 2.               | Explain the Heterodox schools of Indian Philosophy.                                              | CO-1           | L4            |
| 3.               | Identify the differences between Rtam and Satyam in Indian Philosophy.                           | CO-2           | L3            |
| 4.               | Defend knowledge about ethical codes of conduct.                                                 | CO-3           | L5            |
| 5.               | Identify the meaning of transcendental self and why is it important to understand in human life? | CO-4           | L3            |
| 6.               | Explain the function of Tantrayukti in scientific inquiry.                                       | CO-5           | L5            |

| SECTION-C |                                                                                                                                                                  |      |    |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| 7.        | Distinguish the concept of knowledge by Francis Bacon and Bhagavad Gita.                                                                                         | CO-1 | L4 |
| 8.        | Examine invention as a class of knowledge.                                                                                                                       | CO-3 | L4 |
| 9.        | Evaluate the claim that scientific inventions always lead to societal progress. Support your argument with specific examples from recent technological advances. | CO-4 | L5 |

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**Roll No.**

**Total No. of Pages:02**

**Total No. of Questions: 09**

**B.Tech (ECE), Semester 3<sup>rd</sup>**

## ELECTRONIC DEVICES

**Subject Code: BTEC-301-18**

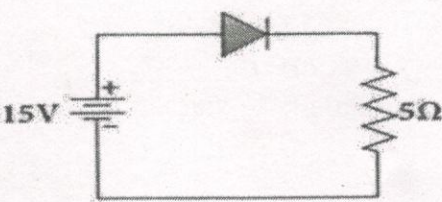
**M.Code: 76444**

**Date of Examination: 07-05-2025**

**Time: 3 Hrs.****Max. Marks: 60****INSTRUCTIONS TO CANDIDATES:**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q. No.           | Question                                                                                                                       | Course Outcome | Bloom's Level |
|------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------|---------------|
| <b>SECTION-A</b> |                                                                                                                                |                |               |
| 1.               | Answer briefly:                                                                                                                |                |               |
| a.               | What are intrinsic semiconductors?                                                                                             | CO-1           | L1            |
| b.               | Explain the importance of sheet resistance in resistor design.                                                                 | CO-1           | L2            |
| c.               | State Heisenberg's uncertainty principle.                                                                                      | CO-1           | L1            |
| d.               | Demonstrate the operation of a solar cell in an electronic circuit.                                                            | CO-2           | L1            |
| e.               | Outline the working of a forward biased p-n junction.                                                                          | CO-2           | L2            |
| f.               | Explain the effect of doping on Zener diode.                                                                                   | CO-2           | L2            |
| g.               | In a bipolar transistor which region is wider and why?                                                                         | CO-3           | L1            |
| h.               | Explain the working principle of a BJT.                                                                                        | CO-3           | L1            |
| i.               | Outline the importance of diffusion.                                                                                           | CO-4           | L2            |
| j.               | Explain why annealing is required in IC fabrication?                                                                           | CO-4           | L2            |
| <b>SECTION-B</b> |                                                                                                                                |                |               |
| 2.               | Examine the de Broglie equation to characterize matter as wave and particle.                                                   | CO-1           | L4            |
| 3.               | Utilize the circuit diagram of full wave bridge rectifier to describe its operation along with its input and output waveforms. | CO-2           | L3            |
| 4.               | Differentiate FET with BJT along with their applications.                                                                      | CO-3           | L4            |
| 5.               | Analyse the Transistor Fabrication Process in detail.                                                                          | CO-4           | L4            |
| 6.               | Evaluate the effectiveness of ion implantation as a doping technique in achieving control over dopant concentration.           | CO-4           | L5            |

| SECTION-C |                                                                                                                                                                                                                                                                                                                                                          |                       |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| 7.        | <p>(a) Develop the circuit of voltage regulator using Zener diode.</p> <p>(b) A <math>5\ \Omega</math> resistor is connected in series with a 15 V power supply as shown in figure below. Find the current that flows through the ideal diode and practical diode.</p>  | <p>CO-2</p> <p>L3</p> |
| 8.        | Compare the current gain, voltage gain and input/output impedance of CE, CB, and CC transistor with proper circuit diagrams. Explain the application of each configuration.                                                                                                                                                                              | <p>CO-3</p> <p>L4</p> |
| 9.        | Evaluate the complete etching process flow used for pattern transfer in IC fabrication by assessing the effectiveness of each step in achieving precise pattern definition. Justify the strategies employed to minimize defects and recommend improvements for enhancing the quality.                                                                    | <p>CO-4</p> <p>L5</p> |

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Total No. of Pages: 02

Subject Code: BTEC-303-18

Date of Examination: 16-05-2026

**Max. Marks: 60**

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| Q No.             | Description                                                                           | CO   | BL |
|-------------------|---------------------------------------------------------------------------------------|------|----|
| <b>Section(A)</b> |                                                                                       |      |    |
| 1.                | Answer briefly:                                                                       |      |    |
| a                 | What does a Smith chart represent?                                                    | CO-1 | L1 |
| b                 | Explain how transmission lines can act as inductors or capacitors at certain lengths? | CO-1 | L2 |
| c                 | State stroke's theorem.                                                               | CO-2 | L1 |
| d                 | Differentiate between static and time-varying Maxwell's equations.                    | CO-2 | L2 |
| e                 | How is average power density calculated in a uniform plane wave?                      | CO-3 | L1 |
| f                 | Outline the concept of pointing vector.                                               | CO-3 | L2 |
| g                 | What is meant by the propagation constant, $\gamma$ ?                                 | CO-4 | L1 |
| h                 | Illustrate total internal reflection.                                                 | CO-4 | L2 |
| i                 | Which parameters influence the propagation constant of a waveguide mode?              | CO-5 | L1 |
| j                 | Distinguish between dominant & degenerate modes.                                      | CO-5 | L2 |
| <b>Section(B)</b> |                                                                                       |      |    |
| 2                 | Examine different techniques of impedance matching in transmission line.              | CO-1 | L4 |
| 3                 | Explain various coordinate system of vectors used in electromagnetics.                | CO-2 | L3 |

| Q No.             | Description                                                                                                                                                                                    | CO   |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 4                 | Evaluate the relative orientation of electric field, magnetic field, and propagation direction in an electromagnetic wave.                                                                     | CO-3 |
| 5                 | Examine expression for electric field when wave is incident normally on the surface of perfect dielectric medium.                                                                              | CO-4 |
| 6                 | Compare characteristics of TE & TM mode for wave between parallel planes & rectangular waveguides.                                                                                             | CO-5 |
| <b>Section(C)</b> |                                                                                                                                                                                                |      |
| 7                 | A distortionless transmission line has characteristic impedance of 50 ohms, attenuation constant of 0.020 Db/m, phase velocity is $1.5 \times 10^6$ m/s. Evaluate line parameters R, L, G & C. | CO-1 |
| 8                 | Explain wave equations for free space.                                                                                                                                                         | CO-3 |
| 9                 | Examine the reflection coefficient of a plane wave incident normally on a perfect dielectric medium by using boundary conditions.                                                              | CO-4 |

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Roll No. 

Total No. of Questions: 9

Date : 22-05-2026  
Total No. of Pages: 1B.TECH(ECE), Semester-6TH  
Subject Name: C# AND .NET PROGRAMMING  
Subject Code: BTEC-906D-18  
Mcode: 79380

Time: 03:00 Hrs.

Max. Marks: 60

**INSTRUCTIONS TO CANDIDATES:**

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q No.            | Description                                                                                                                                                                                                 | CO   | BL | Marks |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|-------|
| <b>SECTION A</b> |                                                                                                                                                                                                             |      |    | 20    |
| a.               | Write the syntax for adding two integers using lambda expression in C#.                                                                                                                                     | CO-1 | L1 | 2     |
| b.               | Describe the role of delegates in event-driven programming.                                                                                                                                                 | CO-1 | L2 | 2     |
| c.               | Explain generics in C# and state their purpose.                                                                                                                                                             | CO-1 | L2 | 2     |
| d.               | What is the purpose of the 'new' keyword in C#?                                                                                                                                                             | CO-2 | L1 | 2     |
| e.               | Illustrate encapsulation using a simple example.                                                                                                                                                            | CO-2 | L2 | 2     |
| f.               | Explain derived class with example.                                                                                                                                                                         | CO-2 | L2 | 2     |
| g.               | What is the significance of Localization in C Sharp.                                                                                                                                                        | CO-3 | L1 | 2     |
| h.               | Describe the concept of thread synchronization.                                                                                                                                                             | CO-3 | L2 | 2     |
| i.               | Why is Diagnostics required in .NET?                                                                                                                                                                        | CO-4 | L1 | 2     |
| j.               | Describe .NET compact framework for developing applications for Smart devices                                                                                                                               | CO-4 | L2 | 2     |
| <b>SECTION B</b> |                                                                                                                                                                                                             |      |    | 20    |
| 2.               | Apply exception handling in C# by constructing a program that handles runtime errors effectively.                                                                                                           | CO-1 | L3 | 5     |
| 3.               | Explain the concept of a copy constructor with the help of a suitable example.                                                                                                                              | CO-2 | L4 | 5     |
| 4.               | Evaluate SAX parser for real-time XML processing applications in detail.                                                                                                                                    | CO-3 | L5 | 5     |
| 5.               | Evaluate various debugging strategies used in .NET applications, highlighting their role in identifying, isolating, and resolving runtime errors.                                                           | CO-4 | L5 | 5     |
| 6.               | Examine Peer Name Resolution Protocol (PNRP) and its basic components.                                                                                                                                      | CO-3 | L4 | 5     |
| <b>SECTION C</b> |                                                                                                                                                                                                             |      |    | 20    |
| 7.               | Analyse and implement a C# program demonstrating inheritance and method overriding. Analyze execution flow and explain how runtime polymorphism improves flexibility.                                       | CO-2 | L4 | 10    |
| 8.               | Examine the concepts of connected and disconnected architectures in the context of ADO.NET and evaluate their performance implications.                                                                     | CO-3 | L4 | 10    |
| 9.               | Critically compare bubbling and tunneling events in .NET. Analyze their event propagation mechanisms within the UI hierarchy. Evaluate their impact on event handling, performance, and application design. | CO-4 | L5 | 10    |

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Roll No. 

Total No. of Questions: 9

Date : 11-05-2026  
Total No. of Pages: 4B.TECH(ECE), Semester-4TH  
Subject Name: DATA STRUCTURES & ALGORITHMS  
Subject Code: BTCS-301-18  
M. Code: 77567

Time: 03:00 Hrs.

Max. Marks: 60

**INSTRUCTIONS TO CANDIDATES:**

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q No.            | Description                                                                                                                                                                                                                                   | CO    | BL | Marks |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|-------|
| <b>SECTION A</b> |                                                                                                                                                                                                                                               |       |    | 20    |
| a.               | Define array and its types as used in data structures.                                                                                                                                                                                        | CO-1  | L1 | 2     |
| b.               | Explain a Doubly linked list and demonstrate insertion at the beginning.                                                                                                                                                                      | CO-1  | L2 | 2     |
| c.               | Explain the concept of time-space trade-off.                                                                                                                                                                                                  | CO-1  | L2 | 2     |
| d.               | What is a LIFO operation and its use in data structures.                                                                                                                                                                                      | CO-2  | L1 | 2     |
| e.               | Explain a queue data structure with an real life example.                                                                                                                                                                                     | CO-2  | L2 | 2     |
| f.               | Explain underflow condition with an suitable example.                                                                                                                                                                                         | CO-2  | L2 | 2     |
| g.               | Define sorting and state the objective of a sorting algorithm.                                                                                                                                                                                | CO-3  | L1 | 2     |
| h.               | Outline the various cases that arise when deleting a node from a BST.                                                                                                                                                                         | CO-3  | L2 | 2     |
| i.               | Define the following graph terminologies: vertex, edge, degree, path, and cycle.                                                                                                                                                              | CO-4  | L1 | 2     |
| j.               | Explain a stable and an unstable sorting algorithm with an example of each.                                                                                                                                                                   | CO-4  | L2 | 2     |
| <b>SECTION B</b> |                                                                                                                                                                                                                                               |       |    | 20    |
| 2.               | Apply linear search to find element 25 in array: {5, 15, 20, 25, 30}.                                                                                                                                                                         | CO-1  | L3 | 5     |
| 3.               | List algorithms for PUSH and POP operations on a stack. Apply the algorithms to perform the following operations: PUSH: 10, 20, 30, POP, PUSH: 40.                                                                                            | CO-2  | L4 | 5     |
| 4.               | Apply the in-order, pre-order, and post-order traversal algorithms to the binary tree with root A and children: A->{B,C}, B->{D,E}, C->{F}, E->{G}. Write all three traversal sequences.                                                      | CO-3  | L4 | 5     |
| 5.               | Apply Heap Sort to the array [4, 10, 3, 5, 1]. Show the max-heap construction phase and the sorting phase step by step.                                                                                                                       | CO-4  | L3 | 5     |
| 6.               | Construct a Binary Search Tree by inserting the keys 45, 15, 79, 90, 10, 55, 12, 20, 50 in the given order. Show the tree after each insertion.                                                                                               | CO-3  | L3 | 5     |
| <b>SECTION C</b> |                                                                                                                                                                                                                                               |       |    | 20    |
| 7.               | Analyze the performance of an algorithm using Big-O, Big-Ω, and Big-Θ notations with suitable examples.                                                                                                                                       | CO-2- | L4 | 10    |
| 8.               | Analyze complete implementation of AVL Tree with Insert and Delete operations. Show all four rotation types with diagrams and trace the AVL tree formed by inserting [15, 10, 20, 8, 12, 17, 25, 6, 11] followed by deleting nodes 20 and 10. | CO-3  | L4 | 10    |
| 9.               | Suppose elements of array A[5][5] occupies 4 bytes, and the address of the first element is 49. Find the address of the element A[4][3] when the storage is row major.                                                                        | CO-1  | L5 | 10    |

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Roll No. 

Total No. of Questions: 9

B.TECH(ECE), Semester-4TH  
 Subject Name: ANALOG CIRCUITS  
 Subject Code: BTEC-401-18 E2  
 M CODE: 77565

Date : 07-05-2026  
 Total No. of Pages: 2

Time: 03:00 Hrs.

Max. Marks: 60

INSTRUCTIONS TO CANDIDATES:

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q No.     | Description                                                                                                                                                                                                                                          | CO   | BL | Marks |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|-------|
| SECTION A |                                                                                                                                                                                                                                                      |      |    | 20    |
| a.        | Which BJT configuration offers phase reversal at the output.                                                                                                                                                                                         | CO-1 | L1 | 2     |
| b.        | Explain which transistor configuration is widely used in amplifier circuits.                                                                                                                                                                         | CO-1 | L2 | 2     |
| c.        | State the type of feedback used in a voltage shunt feedback amplifier.                                                                                                                                                                               | CO-2 | L1 | 2     |
| d.        | Interpret the role of feedback type selection in improving the performance of a voltage amplifier.                                                                                                                                                   | CO-2 | L2 | 2     |
| e.        | List four uses of diodes.                                                                                                                                                                                                                            | CO-3 | L1 | 2     |
| f.        | Illustrate the role of depletion region in diode operation.                                                                                                                                                                                          | CO-3 | L2 | 2     |
| g.        | Which oscillator uses an LC tank circuit for frequency generation?                                                                                                                                                                                   | CO-4 | L1 | 2     |
| h.        | Summarize the advantages of a crystal oscillator.                                                                                                                                                                                                    | CO-4 | L2 | 2     |
| i.        | A Class B amplifier has $V_{cc} = 10V$ and $I_c = 1A$ . Find DC power input.                                                                                                                                                                         | CO-5 | L1 | 2     |
| j.        | List the advantages of transformer coupled Class A power amplifier.                                                                                                                                                                                  | CO-5 | L2 | 2     |
| SECTION B |                                                                                                                                                                                                                                                      |      |    | 20    |
| 2.        | Construct the DC load line and locate the operating point for a BJT amplifier.                                                                                                                                                                       | CO-1 | L3 | 5     |
| 3.        | The overall gain of a multistage amplifier is 100. When negative feedback is applied, the gain reduces to 10. Find the fraction of the output that is feedback to the input.                                                                         | CO-2 | L4 | 5     |
| 4.        | Judge the performance of a positive clipper circuit considering its function, waveform shaping.                                                                                                                                                      | CO-3 | L5 | 5     |
| 5.        | Construct the circuit diagram of an RC phase shift oscillator with description of the waveform.                                                                                                                                                      | CO-4 | L3 | 5     |
| 6.        | Evaluate the effectiveness of Class AB amplifiers in reducing distortion with the help of suitable diagram.                                                                                                                                          | CO-5 | L5 | 5     |
| SECTION C |                                                                                                                                                                                                                                                      |      |    | 20    |
| 7.        | Analyze the conditions required for a feedback amplifier to remain free from oscillations.                                                                                                                                                           | CO-2 | L4 | 10    |
| 8.        | a) Calculate the operating frequency of Colpitt's oscillator if $C_1 = 0.002\mu F$ , $C_2 = 0.02\mu F$ and $L = 20\mu H$ . b) A Hartley oscillator circuit has $L_1 = 30mH$ , $L_2 = 10mH$ and $C = 400pF$ . Calculate the frequency of oscillation. | CO-4 | L4 | 10    |
| 9.        | Construct a detailed block diagram of a Class B power amplifier system and explain the function of each component clearly, highlighting how each part contributes to the overall working and performance of the amplifier.                           | CO-5 | L6 | 10    |

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Roll No. 

Total No. of Questions: 9

Date : 07-05-2026  
Total No. of Pages: 2B.TECH(ECE), Semester-4TH  
Subject Name: ANALOG CIRCUITS  
Subject Code: BTEC-401-18 E2

M Code : 77565

Time: 03:00 Hrs.

Max. Marks: 60

**INSTRUCTIONS TO CANDIDATES:**

SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q No.            | Description                                                                                                                                                                                                                                          | CO   | BL | Marks |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|-------|
| <b>SECTION A</b> |                                                                                                                                                                                                                                                      |      |    | 20    |
| a.               | Which BJT configuration offers phase reversal at the output.                                                                                                                                                                                         | CO-1 | L1 | 2     |
| b.               | Explain which transistor configuration is widely used in amplifier circuits.                                                                                                                                                                         | CO-1 | L2 | 2     |
| c.               | State the type of feedback used in a voltage shunt feedback amplifier.                                                                                                                                                                               | CO-2 | L1 | 2     |
| d.               | Interpret the role of feedback type selection in improving the performance of a voltage amplifier.                                                                                                                                                   | CO-2 | L2 | 2     |
| e.               | List four uses of diodes.                                                                                                                                                                                                                            | CO-3 | L1 | 2     |
| f.               | Illustrate the role of depletion region in diode operation.                                                                                                                                                                                          | CO-3 | L2 | 2     |
| g.               | Which oscillator uses an LC tank circuit for frequency generation?                                                                                                                                                                                   | CO-4 | L1 | 2     |
| h.               | Summarize the advantages of a crystal oscillator.                                                                                                                                                                                                    | CO-4 | L2 | 2     |
| i.               | A Class B amplifier has $V_{cc} = 10V$ and $I_c = 1A$ . Find DC power input.                                                                                                                                                                         | CO-5 | L1 | 2     |
| j.               | List the advantages of transformer coupled Class A power amplifier.                                                                                                                                                                                  | CO-5 | L2 | 2     |
| <b>SECTION B</b> |                                                                                                                                                                                                                                                      |      |    | 20    |
| 2.               | Construct the DC load line and locate the operating point for a BJT amplifier.                                                                                                                                                                       | CO-1 | L3 | 5     |
| 3.               | The overall gain of a multistage amplifier is 100. When negative feedback is applied, the gain reduces to 10. Find the fraction of the output that is feedback to the input.                                                                         | CO-2 | L4 | 5     |
| 4.               | Judge the performance of a positive clipper circuit considering its function, waveform shaping.                                                                                                                                                      | CO-3 | L5 | 5     |
| 5.               | Construct the circuit diagram of an RC phase shift oscillator with description of the waveform.                                                                                                                                                      | CO-4 | L3 | 5     |
| 6.               | Evaluate the effectiveness of Class AB amplifiers in reducing distortion with the help of suitable diagram.                                                                                                                                          | CO-5 | L5 | 5     |
| <b>SECTION C</b> |                                                                                                                                                                                                                                                      |      |    | 20    |
| 7.               | Analyze the conditions required for a feedback amplifier to remain free from oscillations.                                                                                                                                                           | CO-2 | L4 | 10    |
| 8.               | a) Calculate the operating frequency of Colpitt's oscillator if $C_1 = 0.002\mu F$ , $C_2 = 0.02\mu F$ and $L = 20\mu H$ . b) A Hartley oscillator circuit has $L_1 = 30mH$ , $L_2 = 10mH$ and $C = 400pF$ . Calculate the frequency of oscillation. | CO-4 | L4 | 10    |
| 9.               | Construct a detailed block diagram of a Class B power amplifier system and explain the function of each component clearly, highlighting how each part contributes to the overall working and performance of the amplifier.                           | CO-5 | L6 | 10    |

Roll No. Date : 04-05-2026  
Total No. of Pages: 2

Total No. of Questions: 9

B.TECH.(ECE), Semester-4th  
Subject Name: SIGNALS AND SYSTEMS  
Subject Code: BTEC-403-18  
M. Code: 77568

Time: 03:00 Hrs.

Max. Marks: 60

## INSTRUCTIONS TO CANDIDATES:

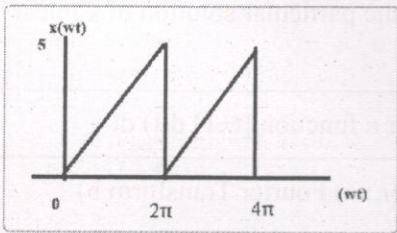
SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q No.     | Description                                                                                          | CO   | BL | Marks |
|-----------|------------------------------------------------------------------------------------------------------|------|----|-------|
| SECTION A |                                                                                                      |      |    | 20    |
| a.        | Find the Energy of the Signal .<br>$x(t) = e^{-2at}$                                                 | CO-1 | L1 | 2     |
| b.        | Illustrate the following signals: a) Unit Step b) Delta Function c) Ramp d) Sinc Function.           | CO-1 | L2 | 2     |
| c.        | State the condition for causality of an LSI system.                                                  | CO-2 | L1 | 2     |
| d.        | Explain the steps used to determine the particular solution of a linear difference equation.         | CO-2 | L2 | 2     |
| e.        | Find the integral of range $-\infty$ to $\infty$ for a function $[t+1] d(t) dt$                      | CO-3 | L1 | 2     |
| f.        | State the mathematical expression for : a) Fourier Transform b) Inverse Fourier Transform.           | CO-3 | L2 | 2     |
| g.        | List out the properties of Z transform.                                                              | CO-4 | L1 | 2     |
| h.        | Describe the significance of ROC in Z transform given below<br>$x(n) = 5(-3)^n u(n) + 7(2)^n u(n)$   | CO-4 | L2 | 2     |
| i.        | Define sample space in probability.                                                                  | CO-5 | L1 | 2     |
| j.        | Describe the probability of obtaining an outcome greater than 4 when a fair six-sided die is rolled. | CO-5 | L2 | 2     |

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Group of Colleges

| Q No.     | Description                                                                                                                                                                   | CO   | BL | Marks |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|-------|
| SECTION B |                                                                                                                                                                               |      |    | 20    |
| 2.        | Apply unit step functions to sketch the signal $x(t) = u(t) + 3u(t-1) - 2u(t-2) + 4u(t-5)$ .                                                                                  | CO-1 | L3 | 5     |
| 3.        | Analyze the stability of an LTI system by relating its impulse response characteristics to bounded input and output behavior.                                                 | CO-2 | L4 | 5     |
| 4.        | Apply the Fourier Transform to determine the transform of a rectangular pulse of duration 2 seconds with a magnitude of 10 volts.                                             | CO-3 | L3 | 5     |
| 5.        | Interpret the Convolution of given signal using Z transform $x(n) = \{2, 4, 6, 1\}$ and $h(n) = \{1, 5, 2, 4\}$                                                               | CO-4 | L5 | 5     |
| 6.        | Prove that the probability of drawing one diamond and one heart from two randomly selected cards of a standard deck can be obtained using appropriate probability principles. | CO-5 | L5 | 5     |
| SECTION C |                                                                                                                                                                               |      |    | 20    |
| 7.        | <p>Solve the Trigonometric and Exponential Fourier Series for the given waveform</p>       | CO-2 | L3 | 10    |
| 8.        | Prove the following properties of Fourier transform a) Time Shifting, b) Duality, c) Frequency Shifting, d) Differentiation                                                   | CO-3 | L5 | 10    |
| 9.        | Explain in detail conditional Probability Density function and also comment on its properties                                                                                 | CQ-5 | L5 | 10    |

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Total No. of Pages: 07

Max. Marks: 60

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q. No.           | Question                                                                                                                               | CO   | BL |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------|------|----|
| <b>SECTION-A</b> |                                                                                                                                        |      |    |
| 1.               | Answer briefly:                                                                                                                        |      |    |
| a.               | How many T-states are there in opcode fetch and Memory Read cycles in 8085 Microprocessor?                                             | CO-1 | L1 |
| b.               | Illustrate different addressing modes used in 8085 microprocessor.                                                                     | CO-1 | L2 |
| c.               | Classify different interrupts of 8085 microprocessor.                                                                                  | CO-1 | L2 |
| d.               | Differentiate between microprocessor and microcontroller.                                                                              | CO-2 | L2 |
| e.               | Explain various memory types used in 8051 microcontroller.                                                                             | CO-2 | L2 |
| f.               | Describe the dual role of Port 2 in 8051 microcontroller.                                                                              | CO-2 | L1 |
| g.               | State function of timer in 8051 microcontroller.                                                                                       | CO-3 | L1 |
| h.               | Describe the role of the IE (Interrupt Enable) register in 8051 Interrupts.                                                            | CO-3 | L2 |
| i.               | Define the term key debouncing.                                                                                                        | CO-4 | L1 |
| j.               | Identify the function of the ALE pin in memory interfacing with 8051 microcontroller.                                                  | CO-4 | L1 |
| <b>SECTION-B</b> |                                                                                                                                        |      |    |
| 2.               | Analyze the detailed architecture of 8085 microprocessor and examine functions of its registers.                                       | CO-1 | L4 |
| 3.               | Inspect the role of ORG, END, EQU and DB assembler Directives used in assembly language programming of 8051 Microcontroller.           | CO-2 | L4 |
| 4.               | Develop an 8051 program to generate a time delay of 1 ms using timer.                                                                  | CO-3 | L3 |
| 5.               | Inspect the working of LCD control signals (RS, RW, EN) during command and data transfer during interfacing with 8051 microcontroller. | CO-4 | L4 |
| 6.               | List and explain the Bit Manipulation instructions of 8051 Microcontroller Assembly language.                                          | CO-3 | L5 |
| <b>SECTION-C</b> |                                                                                                                                        |      |    |
| 7.               | a. Develop an 8085 Microprocessor based Assembly Language Program to multiply two 8-bit numbers that are stored at locations 2050H and | CO-1 | L3 |

|    |                                                                                                                                                                                                                     |      |    |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
|    | 2051H in the memory. The result must be stored at locations 2700H (lower byte) and 2701H (upper byte) in the memory.                                                                                                |      |    |
|    | <p>b. Identify the effect of the following instruction sequence on the stack pointer and general purpose registers:</p> <p>LXI SP, 5000H</p> <p>PUSH H</p> <p>POP D</p> <p>What values are transferred and why?</p> |      |    |
| 8. | Inspect the role of Special Function Registers (SFRs) in timer and interrupt operations with examples in 8051 Microcontroller. Explain any two SFRs in detail.                                                      | CO-3 | L4 |
| 9. | Design interfacing of stepper motor with 8051 microcontroller and construct control sequence.                                                                                                                       | CO-4 | L6 |

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B.Tech ECE Sem-8<sup>th</sup>

Roll No.

Total No. of Pages:02

Total No. of Questions: 09

B.Tech (ECE), Semester 5<sup>th</sup>  
DIGITAL SIGNAL PROCESSING  
Subject Code: BTEC 502-18  
M.Code: 78298  
Date of Examination: 19-05-2025

Time: 3 Hrs.

Max. Marks: 60

**INSTRUCTIONS TO CANDIDATES:**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q. No.           | Question                                                                                                                   | Course Outcome | Bloom's Level |
|------------------|----------------------------------------------------------------------------------------------------------------------------|----------------|---------------|
| <b>SECTION-A</b> |                                                                                                                            |                |               |
| 1.               | Answer briefly:                                                                                                            |                |               |
| a.               | What do you mean by signal processing? Differentiate between analog signal processing and digital signal processing?       | CO-1           | L1            |
| b.               | A discrete time signal is given by $x(n) = \{1,1,2,3,4,5\}$ , Sketch the following signals.<br>$(a)x(n-2)$ and $(b)x(n+1)$ | CO-1           | L2            |
| c.               | List out the steps of linear convolution.                                                                                  | CO-2           | L1            |
| d.               | Show the necessary and sufficient condition for the stability of LTI system.                                               | CO-2           | L2            |
| e.               | List any four properties of Z-transform.                                                                                   | CO-3           | L1            |
| f.               | Demonstrate the Region of Convergence (ROC) in the Z-transform?                                                            | CO-3           | L2            |
| g.               | Infer the condition for a digital filter to be causal and stable.                                                          | CO-4           | L2            |
| h.               | Compare the Butterworth and Chebyshev Type-1 filters.                                                                      | CO-5           | L2            |
| i.               | Classify the addressing modes supported by TMS processors?                                                                 | CO-6           | L2            |
| j.               | Recall the applications of DSP in real-time systems.                                                                       | CO-6           | L1            |
| <b>SECTION-B</b> |                                                                                                                            |                |               |
| 2.               | Solve and obtain energy for the signal given by the following equation.<br>$x(n) = a^n u(n)$ where $ a  < 1$               | CO-1           | L3            |



|                  |                                                                                                                                                              |      |    |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| 3.               | Apply linear convolution to find the system output if $x(n) = \{1,2,3\}$ and $h(n) = \{1, -1\}$ .                                                            | CO-2 | L4 |
| 4.               | Determine sequence $x(n)$ associated with Z- transform.<br>$X(Z) = \frac{5z^{-1}}{(1 - 2z^{-1})(3 - z^{-1})}$                                                | CO-3 | L5 |
| 5.               | Explain impulse invariance method for digital filter designing using proper mathematical equations.                                                          | CO-5 | L4 |
| 6.               | Develop direct form-I and direct form-II IIR filter structures and compare with respect to memory requirements and computational complexity.                 | CO-5 | L3 |
| <b>SECTION-C</b> |                                                                                                                                                              |      |    |
| 7.               | Identify the various operations performed on discrete time signals with graphical representations for each operation.                                        | CO-1 | L3 |
| 8.               | Assess the eight point DFT of the following sequence using in place radix-2 decimation in time FFT algorithm.<br>$x(n) = \{1/2, 1/2, 1/2, 1/2, 0, 0, 0, 0\}$ | CO-4 | L5 |
| 9.               | Construct and explain the architecture of TMS processor with the help of block diagram.                                                                      | CO-6 | L5 |

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Roll No.

Total No. of Pages:02

**Total No. of Questions: 09**

**B.Tech (ECE), Semester 5<sup>th</sup>**

## ANALOG AND DIGITAL COMMUNICATION

**Subject Code: BTEC-501-18**

**M.Code: 78297**

**Date of Examination:** 22-05-2025

Time: 3 Hrs.

**Max. Marks: 60****INSTRUCTIONS TO CANDIDATES:**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q. No.           | Question                                                                                                                                            | Course Outcome | Bloom's Level |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|----------------|---------------|
| <b>SECTION-A</b> |                                                                                                                                                     |                |               |
| 1.               | Answer briefly:                                                                                                                                     |                |               |
| a.               | What is the significance of representing a signal in the frequency domain?                                                                          | CO-1           | L1            |
| b.               | The modulating frequency in an FM system is 400Hz and the modulating voltage is 2.4 V, the modulation index is 60. Calculate the maximum deviation. | CO-1           | L2            |
| c.               | State the Nyquist sampling criterion.                                                                                                               | CO-2           | L1            |
| d.               | Highlight one advantage and one disadvantage of PCM.                                                                                                | CO-2           | L2            |
| e.               | What is Gaussian Noise?                                                                                                                             | CO-3           | L1            |
| f.               | Describe the importance of signal-to-noise ratio (SNR) in communication systems.                                                                    | CO-3           | L2            |
| g.               | Define coherent communication and non-coherent communication.                                                                                       | CO-4           | L1            |
| h.               | Describe the concept of autocorrelation and its importance.                                                                                         | CO-4           | L2            |
| i.               | Write the advantages of PSK over Amplitude Shift Keying (ASK).                                                                                      | CO-5           | L1            |
| j.               | Compare BPSK and QPSK in terms of bandwidth efficiency.                                                                                             | CO-5           | L2            |
| <b>SECTION-B</b> |                                                                                                                                                     |                |               |
| 2.               | Analyze the ring modulator operation for DSB-SC signal generation and compare it with a balanced modulator.                                         | CO-1           | L4            |
| 3.               | Apply sampling theorem to process different sampling techniques and highlight their frequency domain implications.                                  | CO-2           | L3            |
| 4.               | Use probability density functions to calculate the effect of Gaussian noise on PSK systems.                                                         | CO-3           | L5            |
| 5.               | Infer how Quadrature Amplitude Modulation (QAM) is generated? Inspect its application for coherent detection.                                       | CO-4           | L4            |
| 6.               | Examine in detail the generation and detection of QPSK system.                                                                                      | CO-5           | L4            |
| <b>SECTION-C</b> |                                                                                                                                                     |                |               |
| 7.               | Explain the process of generating DSB-SC using a square law modulator and derive its mathematical expression.                                       | CO-1           | L5            |
| 8.               | Derive the expression of SNR in a PCM system for a non sinusoidal signal.                                                                           | CO-3           | L5            |

|    |                                                                                                                 |      |    |
|----|-----------------------------------------------------------------------------------------------------------------|------|----|
| 9. | What is the importance of QAM? Construct the constellation diagram of 16 signals in QAM system with an example. | CO-4 | L4 |
|----|-----------------------------------------------------------------------------------------------------------------|------|----|

| Q. No.    | Question                                                                                                                                             | Course Outcome | Level |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------|
| 1.        | What is the importance of representing a signal in the frequency domain?                                                                             | CO-1           | L1    |
| 2.        | The modulating frequency in an FM system is 400 Hz and the modulating voltage is 2.4 V. The modulation index is 60. Calculate the maximum deviation. | CO-1           | L2    |
| 3.        | State the Nyquist sampling criterion.                                                                                                                | CO-1           | L1    |
| 4.        | Highlight one advantage and one disadvantage of PCM.                                                                                                 | CO-2           | L2    |
| 5.        | What is Gaussian Noise?                                                                                                                              | CO-2           | L1    |
| 6.        | Explain the importance of signal-to-noise ratio (SNR) in communication systems.                                                                      | CO-2           | L2    |
| 7.        | Define coherent communication and non-coherent communication.                                                                                        | CO-2           | L3    |
| 8.        | Explain the concept of autocorrelation and its importance.                                                                                           | CO-2           | L2    |
| 9.        | What are the advantages of FSK over Amplitude Shift Keying (ASK)?                                                                                    | CO-2           | L1    |
| 10.       | Compare BPSK and QPSK in terms of bandwidth efficiency.                                                                                              | CO-2           | L2    |
| SECTION-B |                                                                                                                                                      |                |       |
| 11.       | Analyze the time modulation mechanism for DSB-SC signal generation and compare it with a balanced modulator.                                         | CO-1           | L3    |
| 12.       | Apply sampling theorem to generate discrete sampling functions and highlight their properties.                                                       | CO-2           | L1    |
| 13.       | Use probability density functions to calculate the effect of Gaussian noise on PSK systems.                                                          | CO-2           | L2    |
| 14.       | Explain how Quadrature Amplitude Modulation (QAM) is generated and its application for data transmission.                                            | CO-2           | L3    |
| 15.       | Explain in detail the generation and detection of QPSK system.                                                                                       | CO-2           | L4    |
| SECTION-C |                                                                                                                                                      |                |       |
| 16.       | Explain the process of generating DSSS using spread spectrum technique and its application in wireless communication.                                | CO-1           | L3    |

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Roll No.

Total No. of Pages:02

Total No. of Questions: 09

B.Tech ( ECE), Semester 5<sup>th</sup>

PROGRAMMING IN JAVA

Subject Code: BTEC-905D-18

M.Code: 78710

Date of Examination: 25-05-2026

Time: 3 Hrs.

Max. Marks: 60

**INSTRUCTIONS TO CANDIDATES:**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q. No.           | Question                                                                                 | Course Outcome | Bloom's Level |
|------------------|------------------------------------------------------------------------------------------|----------------|---------------|
| <b>SECTION-A</b> |                                                                                          |                |               |
| 1.               | Answer briefly:                                                                          |                |               |
| a.               | What is a variable in Java? Give an example.                                             | CO-1           | L1            |
| b.               | Classify the different data types in Java.                                               | CO-1           | L2            |
| c.               | Contrast the use of single-line and multi-line comments in Java.                         | CO-1           | L2            |
| d.               | List the four types of operators in java.                                                | CO-2           | L1            |
| e.               | Contrast for loop and while loop with syntax.                                            | CO-2           | L2            |
| f.               | Compare the behavior of break and continue in loops.                                     | CO-2           | L2            |
| g.               | Define generalization in the context of inheritance.                                     | CO-3           | L1            |
| h.               | Explain two methods of the Graphics class.                                               | CO-3           | L2            |
| i.               | What does JFC stand for?                                                                 | CO-4           | L1            |
| j.               | Compare RMI and CORBA.                                                                   | CO-4           | L2            |
| <b>SECTION-B</b> |                                                                                          |                |               |
| 2.               | Develop a Java program that uses comments effectively to explain each line of code.      | CO-1           | L3            |
| 3.               | Analyze the difference between pre-increment and post-increment operators with examples. | CO-2           | L4            |
| 4.               | Justify the need for exception handling during application development.                  | CO-3           | L5            |
| 5.               | Identify the mechanism for connecting to a back-end database using JDBC.                 | CO-4           | L3            |
| 6.               | Justify the use of CORBA in cross-platform communication.                                | CO-4           | L5            |

| SECTION-C |                                                                                                                     |      |    |
|-----------|---------------------------------------------------------------------------------------------------------------------|------|----|
| 7.        | Choose the appropriate Java keywords used to declare classes, methods, and variables, and explain the role of each. | CO-1 | L3 |
| 8.        | Distinguish between the different types of inheritance in Java with suitable examples.                              | CO-3 | L4 |
| 9.        | Evaluate the role of Swing components in modern GUI development.                                                    | CO-4 | L5 |

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Roll No.

**Total No. of Pages: 02**

**Total No. of Questions: 09**

**B.Tech ECE, Semester-5<sup>th</sup>**

## PROJECT MANAGEMENT

**Subject Code: BTEC- 505-18**

**M.Code: 78302**

**Date of Examination:** 14-05-2026

**Time: 3 Hrs.****Max. Marks: 60****INSTRUCTIONS TO CANDIDATES:**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q. No.           | Question                                                                                                       | Course Outcome | Bloom's Level |
|------------------|----------------------------------------------------------------------------------------------------------------|----------------|---------------|
| <b>SECTION-A</b> |                                                                                                                |                |               |
| 1.               | Answer briefly:                                                                                                |                |               |
| a.               | What is meant by project charter?                                                                              | CO-1           | L1            |
| b.               | Contrast project initiation and project planning.                                                              | CO-1           | L2            |
| c.               | State two advantages of using an Request for Proposal (RFP).                                                   | CO-2           | L1            |
| d.               | Summarize two reasons for using mixed organizational systems.                                                  | CO-2           | L2            |
| e.               | Define project crashing.                                                                                       | CO-3           | L1            |
| f.               | Explain the role of network techniques in planning.                                                            | CO-3           | L2            |
| g.               | Recall two common types of project audits.                                                                     | CO-4           | L1            |
| h.               | Interpret why scope control is critical.                                                                       | CO-4           | L2            |
| i.               | Relate resource allocation and resource sharing in project management.                                         | CO-5           | L1            |
| j.               | Explain why schedule control is vital in maintaining project timelines.                                        | CO-5           | L2            |
| <b>SECTION-B</b> |                                                                                                                |                |               |
| 2.               | Inspect how Global Project Management affects communication, culture, and coordination among teams.            | CO-1           | L4            |
| 3.               | Choose an appropriate organizational structure for a small-scale construction project and justify your choice. | CO-2           | L3            |
| 4.               | Evaluate how GERT differs from PERT/CPM and discuss when GERT should be used in complex projects.              | CO-3           | L5            |
| 5.               | Examine the most suitable performance indicator for evaluating project quality and justify your selection.     | CO-4           | L4            |

|                  |                                                                                                                               |      |    |
|------------------|-------------------------------------------------------------------------------------------------------------------------------|------|----|
| 6.               | Estimate the reasons why project audits often reveal performance gaps. Suggest preventive measures.                           | CO-5 | L5 |
| <b>SECTION-C</b> |                                                                                                                               |      |    |
| 7.               | Examine why needs identification is considered the foundation of effective project management.                                | CO-1 | L4 |
| 8.               | Analyze the use of network techniques like GERT in probabilistic project environments where activity durations are uncertain. | CO-3 | L4 |
| 9.               | Judge how the responsibilities of evaluators and auditors influence the credibility of a project audit.                       | CO-4 | L5 |

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|                  |                                                                                                          |      |    |
|------------------|----------------------------------------------------------------------------------------------------------|------|----|
| 6.               | Determine the applications of ICs in data communication.                                                 | CO-5 | L5 |
| <b>SECTION-C</b> |                                                                                                          |      |    |
| 7.               | Examine the role of constant current bias and justify its superiority over resistive biasing.            | CO-1 | L4 |
| 8.               | Inspect the logarithmic and antilog amplifiers for sensor-interface circuits in instrumentation systems. | CO-3 | L4 |
| 9.               | Judge the design of a Wein Bridge Oscillator for stability and frequency accuracy.                       | CO-4 | L5 |

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| SECTION-B |                                                                                                                                                                                                                                                                                                                                                                                                              |      |    |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| 2.        | <p>Apply Mason's Gain Formula to find the Transfer function <math>Y_6(s)/Y_1(s)</math> for the following SFG:</p>                                                                                                                                                                                                                                                                                            | CO-1 | L3 |
| 3.        | Categorize the different Static Error Constants. Calculate the values for the same for TYPE '0', TYPE '1' and TYPE '2' systems.                                                                                                                                                                                                                                                                              | CO-2 | L4 |
| 4.        | <p>For a unity feedback system, the open-loop transfer function is given by <math>G(s)</math>.</p> $G(s) = \frac{K(s+1)}{s^2(s+3.6)}$ <p>Sketch the Root Locus for <math>0 \leq K \leq \infty</math> and evaluate the stability of system.</p>                                                                                                                                                               | CO-3 | L5 |
| 5.        | Why do we need compensators in control system? Explain Phase lag compensation network and derive its Transfer Function.                                                                                                                                                                                                                                                                                      | CO-4 | L5 |
| 6.        | Derive the solution of State Space Equations for Non-Homogeneous Control System.                                                                                                                                                                                                                                                                                                                             | CO-6 | L3 |
| SECTION-C |                                                                                                                                                                                                                                                                                                                                                                                                              |      |    |
| 7.        | <p>a) Compare Proportional, Integral and Derivative controllers in terms of their advantages and disadvantages.</p> <p>b) Inspect the stability of the system: <math>s^4 + 2s^3 + 3s^2 + 4s + 5 = 0</math> using Routh Hurwitz Criteria.</p>                                                                                                                                                                 | CO-2 | L4 |
| 8.        | <p>a) Correlate the resonant peak (<math>M_r</math>), bandwidth (BW), and damping ratio (<math>\zeta</math>) of a second-order system.</p> <p>b) A second-order system has <math>\omega_n</math> (natural frequency of oscillations) = 10 rad/sec and <math>\zeta = 0.2</math>. Compute the resonant frequency <math>\omega_r</math> and resonant peak <math>M_r</math>. State whether resonance exists.</p> | CO-4 | L4 |
| 9.        | <p>a) Explain the physical interpretation of Observability in Control systems with Examples.</p> <p>b) For the system given below, test the Controllability using Controllability Matrix. (equation given)</p> $\dot{x} = \begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix} x(t) + \begin{bmatrix} 0 \\ 1 \end{bmatrix} u(t)$                                                                                   | CO-5 | L5 |

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Roll No. 

Total No. of Questions: 9

Date : 19-05-2026  
Total No. of Pages: 4B.TECH(ECE), Semester-6TH  
Subject Name: MICROWAVE AND ANTENNA ENGINEERING  
Subject Code: BTEC-603-18  
Mcode: 79376

Time: 03:00 Hrs.

Max. Marks: 60

## INSTRUCTIONS TO CANDIDATES:

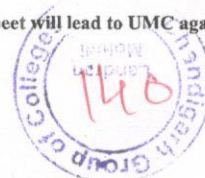
SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.

SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.

SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q No.     | Description                                                                                                                                                  | CO   | BL | Marks |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|-------|
| SECTION A |                                                                                                                                                              |      |    | 20    |
| a.        | Recall the purpose of a slow-wave structure in a travelling wave tube (TWT).                                                                                 | CO-1 | L1 | 2     |
| b.        | Compare linear beam tubes and cross-field tubes with respect to structure and operation.                                                                     | CO-1 | L2 | 2     |
| c.        | Classify limitations of conventional tubes at microwave frequencies.                                                                                         | CO-1 | L2 | 2     |
| d.        | Define coupling coefficient in terms of directional coupler.                                                                                                 | CO-2 | L1 | 2     |
| e.        | Summarize operation of Circulator in microwave components.                                                                                                   | CO-2 | L2 | 2     |
| f.        | State the principle of waveguide in gyrator.                                                                                                                 | CO-2 | L2 | 2     |
| g.        | Write the mathematical expression for Voltage Standing Wave Ratio (VSWR).                                                                                    | CO-3 | L1 | 2     |
| h.        | Outline the relationship between gain, directivity, and efficiency.                                                                                          | CO-3 | L2 | 2     |
| i.        | Name the arrays that use non-uniform amplitude distribution.                                                                                                 | CO-4 | L1 | 2     |
| j.        | Interpret the concept of loop antennas used for direction finding.                                                                                           | CO-4 | L2 | 2     |
| SECTION B |                                                                                                                                                              |      |    | 20    |
| 2.        | Make use of avalanche transit time effect to develop microwave generation in an IMPATT diode                                                                 | CO-1 | L3 | 5     |
| 3.        | Examine the principle of power measurement using a calorimeter method.                                                                                       | CO-2 | L4 | 5     |
| 4.        | A short dipole having wavelength of $\lambda/50$ . Evaluate radiation resistance & antenna efficiency if directive gain is 20 & loss resistance is 0.5 ohms. | CO-3 | L5 | 5     |
| 5.        | Explain the radiation mechanism of a horn antenna as a type of aperture antenna.                                                                             | CO-4 | L5 | 5     |
| 6.        | Apply the concept of reflection coefficient to solve standing wave ratio in an antenna system.                                                               | CO-3 | L3 | 5     |
| SECTION C |                                                                                                                                                              |      |    | 20    |
| 7.        | Solve scattering matrix for EH plane tee by using properties of Scattering Matrix.                                                                           | CO-2 | L3 | 10    |
| 8.        | Examine the asymptotic current distribution in a half-wave dipole and explain the electric and magnetic field components.                                    | CO-3 | L4 | 10    |
| 9.        | Explain the concept of Dolph-Chebyshev antenna arrays and determine how the Chebyshev polynomial helps control side-lobe levels.                             | CO-4 | L5 | 10    |

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**Total No. of Pages: 02**

**Total No. of Questions: 09**

**Subject Code: BTEC-602-18**

**M.Code: 79375**

**Date of Examination: 12-05-2026**

Time: 3 Hrs.

M. Code: 79375

**Max. Marks: 60**

**INSTRUCTIONS TO CANDIDATES:**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q. No.           | Question                                                                                                                                                                                                                          | CO   | BL |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| <b>SECTION-A</b> |                                                                                                                                                                                                                                   |      |    |
| 1.               | Answer briefly:                                                                                                                                                                                                                   |      |    |
| a.               | What do you mean by numerical aperture and acceptance angle of graded-index fibres.                                                                                                                                               | CO-1 | L1 |
| b.               | List the different types of channel multiplexing techniques.                                                                                                                                                                      | CO-1 | L1 |
| c.               | Define (i) Bending loss (ii) Polarization mode dispersion.                                                                                                                                                                        | CO-1 | L2 |
| d.               | What do you mean by receiver sensitivity?                                                                                                                                                                                         | CO-2 | L1 |
| e.               | Explain how do we measure scattering loss occurs due to Rayleigh scattering.                                                                                                                                                      | CO-2 | L2 |
| f.               | What are the various mechanical properties of fibres?                                                                                                                                                                             | CO-2 | L1 |
| g.               | Why silicon is not used to fabricate LED or Laser diodes?                                                                                                                                                                         | CO-3 | L1 |
| h.               | Explain various requirements of optical Detectors.                                                                                                                                                                                | CO-3 | L2 |
| i.               | What is the concept of modulation in an LED?                                                                                                                                                                                      | CO-4 | L1 |
| j.               | Explain direct bandgap and indirect bandgap materials.                                                                                                                                                                            | CO-4 | L2 |
| <b>SECTION-B</b> |                                                                                                                                                                                                                                   |      |    |
| 2.               | A graded index fibre has a parabolic refractive index profile with $45\mu\text{m}$ diameter. The numerical aperture is 0.25. Calculate the number of guided modes propagating when it is operated at $1.5\mu\text{m}$ wavelength. | CO-1 | L3 |



|                  |                                                                                                                                                                      |      |    |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| 3.               | Categorize chromatic and intermodal dispersion in optical fibre communication.                                                                                       | CO-2 | L4 |
| 4.               | Derive the expressions for photo detector noise and response time.                                                                                                   | CO-3 | L5 |
| 5.               | Write in detail the WDM Systems used in optical communication systems.                                                                                               | CO-4 | L3 |
| 6.               | Explain link power budget with necessary expressions. Design an optical fiber link for transmitting 15 Mbps of data for a distance of 4 km with a BER of $10^{-9}$ . | CO-3 | L5 |
| <b>SECTION-C</b> |                                                                                                                                                                      |      |    |
| 7.               | Examine different Maxwell equations and investigate wave equation for step index fibre.                                                                              | CO-1 | L4 |
| 8.               | Identify different sources of power penalty in optical communication system? Express in details.                                                                     | CO-3 | L3 |
| 9.               | Explain the Outside Vapor Deposition (OVD) method used for optical fibre manufacturing with a neat diagram.                                                          | CO-4 | L5 |

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|                  |                                                                                                                                                               |      |    |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| 6.               | Explain regression analysis to predict house prices. Explain its variables and output.                                                                        | CO-5 | L5 |
| <b>SECTION-C</b> |                                                                                                                                                               |      |    |
| 7.               | Appraise how well a Color Selection Algorithm operates in AIML and examine the impact of different reasoning styles on its selection process.                 | CO-1 | L4 |
| 8.               | Analyze frame-based knowledge representation (KR) in Artificial Intelligence with the help of a practical example. Examine the advantages of this form of KR. | CO-3 | L4 |
| 9.               | Explain the structure of an expert system with a neat diagram. How do knowledge base and inference engine interact?                                           | CO-4 | L5 |

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**Total No. of Questions: 09**

**B.Tech ECE, Semester-7<sup>th</sup>**

## SOFT COMPUTING

**Subject Code: BTEC-908D-18**

**M.Code: 90681**

**Date of Examination:** 13-05-2026

**Time: 3 Hrs.****Max. Marks: 60**

### INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q. No.           | Question                                                                               | Course Outcome | Bloom's Level |
|------------------|----------------------------------------------------------------------------------------|----------------|---------------|
| <b>SECTION-A</b> |                                                                                        |                |               |
| 1.               | Answer briefly:                                                                        |                |               |
| a.               | What is the main purpose of Soft Computing?                                            | CO-1           | L1            |
| b.               | Explain soft computing with reference to artificial neural network concept.            | CO-1           | L2            |
| c.               | Define crossover operation in GA.                                                      | CO-2           | L1            |
| d.               | Compare phenotype and genotype in genetic algorithm.                                   | CO-2           | L2            |
| e.               | Recall sigmoid activation function.                                                    | CO-3           | L1            |
| f.               | Define perceptron learning rule.                                                       | CO-3           | L2            |
| g.               | Compare crisp set and fuzzy set.                                                       | CO-4           | L1            |
| h.               | Explain the basic fuzzy set operations.                                                | CO-4           | L2            |
| i.               | List advantages of using swarm intelligence in optimization problems.                  | CO-5           | L1            |
| j.               | Relate how swarm intelligence is applied in bees.                                      | CO-5           | L2            |
| <b>SECTION-B</b> |                                                                                        |                |               |
| 2.               | Analyze the main methods used in soft computing? Explain with examples.                | CO-1           | L4            |
| 3.               | Examine one-point, two-point, and uniform crossover in GA with suitable examples.      | CO-2           | L4            |
| 4.               | Explain Adaptive Resonance Theory and its applications.                                | CO-3           | L5            |
| 5.               | Compare Hebbian and Widrow-Hoff learning used in NN.                                   | CO-4           | L4            |
| 6.               | Compare different animals behavior in context to swarm intelligence and give examples. | CO-5           | L5            |

| SECTION-C |                                                                                                                                                                                     |      |    |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| 7.        | Analyze building block hypothesis and schema theorem in GA with examples.                                                                                                           | CO-2 | L4 |
| 8.        | Compute the net input and output of a perceptron with $x_1=1$ , $x_2=-1$ , $w_1=0.4$ , $w_2=0.6$ , $b=0.2$ using a step activation function<br>b) sigmoid function(Binary sigmoid). | CO-3 | L3 |
| 9.        | Explain the architecture of Adaptive Neuro-Fuzzy Inference Systems and Coactive Neuro-Fuzzy modelling used in fuzzy systems.                                                        | CO-4 | L5 |

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Roll No.

**Total No. of Pages: 01**

Total No. of Questions: 09

**B.Tech (ECE), Semester 7<sup>TH</sup>**  
**PYTHON PROGRAMMING**  
**Subject Code: BTEC-907D-18**

**M.Code:90676**

**Date of Examination: 09-05-2026**

Time: 3 Hrs.

**Max. Marks: 60**

**INSTRUCTIONS TO CANDIDATES:**

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
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| questions.       |                                                                                                                | CO   | BL |
|------------------|----------------------------------------------------------------------------------------------------------------|------|----|
| Q. No.           | Question                                                                                                       |      |    |
| <b>SECTION-A</b> |                                                                                                                |      |    |
| 1.               | Answer briefly:                                                                                                |      |    |
| a.               | List the major steps involved in Python's programming cycle.                                                   | CO-1 | L1 |
| b.               | Classify the features of an IDE that help programmers.                                                         | CO-1 | L2 |
| c.               | Describe the use of the print() function for interaction.                                                      | CO-1 | L2 |
| d.               | Find the length of the string "Python Programming".                                                            | CO-2 | L1 |
| e.               | Explain the use of sets in Python.                                                                             | CO-2 | L2 |
| f.               | Summarize the benefits of using list comprehensions.                                                           | CO-2 | L2 |
| g.               | Define an exception in Python.                                                                                 | CO-3 | L1 |
| h.               | Explain the significance of file.close().                                                                      | CO-3 | L2 |
| i.               | List two examples of ADTs in Python.                                                                           | CO-4 | L1 |
| j.               | Explain the concept of method overriding in inheritance.                                                       | CO-4 | L2 |
| <b>SECTION-B</b> |                                                                                                                |      |    |
| 2.               | Examine the evaluation process of Boolean expressions in Python with the help of truth tables.                 | CO-1 | L4 |
| 3.               | Analyze the mutability differences between lists and tuples with coding demonstrations.                        | CO-2 | L4 |
| 4.               | Judge the effectiveness of assertions compared to exception handling for error management.                     | CO-3 | L5 |
| 5.               | Explain the role of '__init__' and '__str__' methods in Python class operations with suitable example of each. | CO-4 | L5 |
| 6.               | Utilize the Sieve of Eratosthenes in Python to list all prime numbers below 100.                               | CO-3 | L3 |
| <b>SECTION-C</b> |                                                                                                                |      |    |
| 7.               | Examine implicit and explicit type conversion and explain how each effects numeric computations with examples. | CO-1 | L4 |
| 8.               | Analyze file modes:- r, w, a, rb, wb and illustrate when each should be selected with examples.                | CO-3 | L4 |
| 9.               | Explain with an example how multiple inheritance works in Python and method resolution order is applied.       | CO-4 | L5 |

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Total No. of Pages: 02

**Total No. of Questions: 09**

**B.Tech (ECE), Semester 7<sup>TH</sup>**

## DATABASE MANAGEMENT SYSTEM

**Subject Code: -BTCS-501-18**

**M.Code: - 90493**

Date of Examination: 06-05-2025

**Time: 3 Hrs.**

**Max. Marks: 60**

### INSTRUCTIONS TO CANDIDATES:

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

| Q. No.           | Question                                                                                         | Course Outcome | Bloom's Level |
|------------------|--------------------------------------------------------------------------------------------------|----------------|---------------|
| <b>SECTION-A</b> |                                                                                                  |                |               |
| 1.               | Answer briefly:                                                                                  |                |               |
| a.               | List the database Applications.                                                                  | CO-1           | L1            |
| b.               | Explain about Database storage structure.                                                        | CO-1           | L2            |
| c.               | Define Aggregate Functions.                                                                      | CO-2           | L1            |
| d.               | Summarize the role of attributes in an ER model.                                                 | CO-2           | L2            |
| e.               | What is hashing in file organization?                                                            | CO-3           | L1            |
| f.               | Illustrate fully functional dependency with example.                                             | CO-3           | L2            |
| g.               | Define a checkpoint.                                                                             | CO-4           | L1            |
| h.               | Explain about several ordered indexing.                                                          | CO-4           | L2            |
| i.               | Why is the logical level of a database important?                                                | CO-5           | L1            |
| j.               | Give one example of how logical data independence helps users.                                   | CO-5           | L2            |
| <b>SECTION-B</b> |                                                                                                  |                |               |
| 2.               | Elaborate the keys of DBMS with example.                                                         | CO-1           | L5            |
| 3.               | Dissect various Relational algebra operations with the help of an example of each.               | CO-2           | L4            |
| 4.               | Differentiate between extendable and linear hashing using suitable example.                      | CO-3           | L4            |
| 5.               | Design a secure login query that prevents SQL injection attacks.                                 | CO-4           | L6            |
| 6.               | Identify the advantages & disadvantages of graph based protocol over two phase locking protocol. | CO-5           | L3            |

| SECTION-C |                                                                                                       |      |    |
|-----------|-------------------------------------------------------------------------------------------------------|------|----|
| 7.        | Explain the 2-Tier and 3-Tier Architectures in detail with the help of neat diagram.                  | CO-1 | L5 |
| 8.        | Write short note on the following: a) Armstrong's Axioms<br>b) RBAC Model c) MAC Model, d) DAC Model. | CO-3 | L5 |
| 9.        | Apply multi-factor authentication to design a secure login system for online banking.                 | CO-4 | L3 |

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Total No. of Pages: 02

ECE

Total No. of Questions: 09

B.Tech (ECE), Semester 7<sup>th</sup>

Computer Organization &amp; Architecture

Subject Code: BTES-401-18

M.Code: 90491

Date of Examination: 30-04-2026

Time: 3 Hrs.

Max. Marks: 60

**INSTRUCTIONS TO CANDIDATES:**

1. SECTION-A is **COMPULSORY** consisting of **TEN** questions carrying **TWO** marks each.
2. SECTION-B contains **FIVE** questions carrying **FIVE** marks each and students have to attempt any **FOUR** questions.
3. SECTION C contains **THREE** questions carrying **TEN** marks each and students have to attempt any **TWO** questions.

| Q. No.           | Question                                                                    | CO   | BL |
|------------------|-----------------------------------------------------------------------------|------|----|
| <b>SECTION-A</b> |                                                                             |      |    |
| 1.               | Answer briefly:                                                             |      |    |
| a.               | List two differences between hardwired and micro-programmed control units.  | CO-1 | L1 |
| b.               | Explain the function of the Program Counter in CPU control.                 | CO-1 | L2 |
| c.               | Explain the concept of memory hierarchy in computer systems.                | CO-1 | L2 |
| d.               | Illustrate how the control unit manages instruction execution.              | CO-2 | L2 |
| e.               | Contrast synchronous and asynchronous data transfers.                       | CO-2 | L2 |
| f.               | Write two types of memory organizations.                                    | CO-2 | L1 |
| g.               | Define pipelining in computer architecture.                                 | CO-5 | L1 |
| h.               | Describe write-back policy in cache memory.                                 | CO-3 | L2 |
| i.               | State how a DMA controller transfers data between memory and an I/O device? | CO-4 | L1 |
| j.               | Interpret the impact of I/O interrupts on CPU performance.                  | CO-4 | L2 |

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| SECTION-B |                                                                                                                                                                                                                                      |      |    |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----|
| 2.        | Classify various types of semiconductor memory technologies used in computer systems.                                                                                                                                                | CO-1 | L4 |
| 3.        | Construct a 8085 Microprocessor based program to add two 8-bit numbers from 2050H and 2051H and store the result at 2052H.                                                                                                           | CO-2 | L3 |
| 4.        | Explain how pipelining improves CPU performance with an example.                                                                                                                                                                     | CO-5 | L5 |
| 5.        | Distinguish between structural hazard and data hazard with appropriate examples to simplify the concept.                                                                                                                             | CO-4 | L4 |
| 6.        | Elaborate cache size and block size, and analyze their impact on cache performance.                                                                                                                                                  | CO-3 | L6 |
| SECTION-C |                                                                                                                                                                                                                                      |      |    |
| 7.        | Examine the architecture of a computer system by dissecting the functions of the CPU, memory, input-output subsystems, and the control unit, and also examine the relationships among these components during instruction execution. | CO-2 | L4 |
| 8.        | Construct the architecture of parallel processors and criticize challenges of concurrent memory access.                                                                                                                              | CO-3 | L3 |
| 9.        | Compare three cache mapping techniques (direct-mapped, fully associative, set-associative) and explain their advantages, disadvantages, and typical use cases.                                                                       | CO-4 | L5 |

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