

CBCS SCHEME

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BEC501

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 Technological Innovation and Management Entrepreneurship

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

| Module – 1 | | | M | L | C |
|------------|----|---|----|----|-----|
| Q.1 | a. | Explain the different roles played by Managers. | 10 | L1 | CO1 |
| | b. | Describe the managerial skills required using skill-mix diagram. | 10 | L1 | CO1 |
| OR | | | | | |
| Q.2 | a. | Explain the various steps involved in planning. | 10 | L2 | CO1 |
| | b. | Explain all the steps in rational decision making with a neat diagram. | 10 | L2 | CO1 |
| Module – 2 | | | | | |
| Q.3 | a. | Define organization. Briefly explain the principles of organizing. | 10 | L2 | CO2 |
| | b. | What is recruitment? Explain the steps in the selection process. | 10 | L2 | CO2 |
| OR | | | | | |
| Q.4 | a. | Explain Maslow's need hierarchy theory with a neat diagram along with examples. | 10 | L2 | CO2 |
| | b. | Discuss Autocratic, Democratic and Free-rein leadership styles. | 10 | L2 | CO2 |
| Module – 3 | | | | | |
| Q.5 | a. | Define Social Audit. Explain the benefits and limitations of social audit. | 10 | L2 | CO3 |
| | b. | Explain the different views on social responsibility of business. | 10 | L2 | CO3 |
| OR | | | | | |
| Q.6 | a. | Explain different types of entrepreneurs by defining an entrepreneur. | 10 | L2 | CO3 |
| | b. | Explain entrepreneurial development cycle. | 10 | L2 | CO3 |
| Module – 4 | | | | | |
| Q.7 | a. | Explain the different Government policy and development of the small scale sector in India. | 10 | L2 | CO4 |
| | b. | Explain the problems for small scale industries. | 10 | L2 | CO4 |
| OR | | | | | |
| Q.8 | a. | Explain the identification of business opportunities in India. | 10 | L2 | CO4 |
| | b. | Explain in detail the project feasibilities. | 10 | L2 | CO4 |
| Module – 5 | | | | | |
| Q.9 | a. | What are the reasons for failure of some business plans? | 10 | L2 | CO4 |
| | b. | Explain the Government schemes for funding business. | 10 | L2 | CO4 |
| OR | | | | | |
| Q.10 | a. | Explain the challenges and difficulties in starting an enterprise. | 10 | L2 | CO4 |
| | b. | Describe the limitations and differences of PERT and CPM. | 10 | L2 | CO4 |

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BEC502

Fifth Semester B.E/B.Tech. Degree Examination, Dec.2024/Jan.2025

Digital Signal Processing

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

| Module – 1 | | | M | L | C |
|------------|----|--|---|----|-----|
| 1 | a. | List and discuss different discrete time signals. | 7 | L2 | CO1 |
| | b. | Explain the steps of converting analog to digital signal in terms of frequencies. | 7 | L2 | CO1 |
| | c. | Discuss the advantages and limitations of Digital Signal Processing (DSP). | 6 | L2 | CO1 |
| OR | | | | | |
| 2 | a. | With an example, explain how to verify any signal is periodic or Not. | 6 | L2 | CO1 |
| | b. | Derive the equation for output of a LTI system and list the steps of convolution. | 8 | L3 | CO2 |
| | c. | Write a program to generate : i) Circuit step sequence ii) Sinusoidal sequence. | 6 | L3 | CO2 |
| Module – 2 | | | | | |
| 3 | a. | Describe the properties of Z – transformation. | 7 | L3 | CO2 |
| | b. | Show that Discrete Fourier Transform (DFT) is a Linear Transformation. | 7 | L3 | CO2 |
| | c. | Compute the N-point DFT of $x(n) = \{1, 1, 0, 0\}$. | 6 | L3 | CO2 |
| OR | | | | | |
| 4 | a. | Compute the N-point DFT of, $x(n) = e^{j\omega_0 n}$. | 6 | L3 | CO2 |
| | b. | State and prove symmetry property of DFT for real valued sequence. | 6 | L3 | CO2 |
| | c. | Compute circular convolution of sequences : $x_1(n) = \{2, 1, 2, 1\}$ and $x_2(n) = \{1, 2, 3, 4\}$. | 8 | L3 | CO2 |
| Module – 3 | | | | | |
| 5 | a. | State and prove circular time shift property of DFT. | 6 | L3 | CO2 |
| | b. | Compare DFT and FFT with examples. | 6 | L2 | CO3 |
| | c. | Compute Radix – 2 DIT FFT of the following – sequence, $x(n) = n + 1$, for $0 \leq n \leq 7$. | 8 | L3 | CO3 |
| OR | | | | | |
| 6 | a. | State and prove Parseval's theorem for – DFT's. | 6 | L3 | CO2 |
| | b. | Explain overlap – save method used for the convolution of long input sequences. | 6 | L2 | CO3 |
| | c. | Develop an algorithm for Radix – 2 FFT without using built in function. | 8 | L3 | CO3 |

Module – 4

| | | | | | |
|---|----|---|---|----|-----|
| 7 | a. | Obtain the frequency response expression for the symmetric linear phase FIR filter. | 8 | L3 | CO4 |
| | b. | Compare different widows used to design FIR filters. | 6 | L2 | CO4 |
| | c. | Design an FIR filter using hamming window for $N = 7$. The desired frequency response is given by $H_d(\omega) = \begin{cases} e^{-j3\omega} & \omega \leq \frac{3\pi}{4} \\ 0, & \frac{3\pi}{4} < \omega \leq \pi \end{cases}$ | 6 | L3 | CO4 |

OR

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|---|----|--|---|----|-----|
| 8 | a. | Discuss the characteristics of practical frequency selective filters. | 6 | L3 | CO4 |
| | b. | Explain the steps of designing linear phase FIR high pass filter. | 8 | L2 | CO4 |
| | c. | Realize the system function of following FIR filter in cascade form. $H(z) = 1 - 2z^{-1} + \frac{1}{2}z^{-2} + \frac{1}{2}z^{-3} - \frac{1}{2}z^{-4}$. | 6 | L3 | CO4 |

Module – 5

| | | | | | |
|---|----|---|---|----|-----|
| 9 | a. | Explain the design procedure of analog Butter worth lowpass prototype – filter? | 8 | L3 | CO5 |
| | b. | Construct the system function in S – domain for $N = A$. | 6 | L3 | CO5 |
| | c. | Realize direct form – II for the IIR filter represented by $y(n) - \frac{1}{4}y(n-1) + \frac{1}{8}y(n-2) = x(n) + \frac{1}{2}x(n-2)$. | 6 | L3 | CO5 |

OR

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|----|----|--|---|----|-----|
| 10 | a. | Design the digital IIR filter for following details. –3dB gain at 0.5π rads and the stop band attenuation of 15dB at 0.75π rads. Assume $T_s = 15$. | 8 | L3 | CO5 |
| | b. | Explain the significance of : i) Prewarping ii) Bilinear transformation. | 6 | L2 | CO5 |
| | c. | Obtain the direct form-I realization of following IIR filter : $H(z) = \frac{1 + 0.4z^{-1}}{1 - 0.5z^{-1} + 0.06z^{-2}}$ | 6 | L3 | CO5 |

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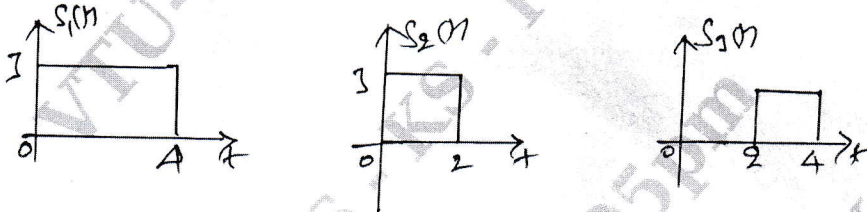
Fifth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025

Digital Communication

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

| Module – 1 | | | | M | L | C |
|------------|----|--|--|----|----|-----|
| Q.1 | a. | Explain Hilbert transform and its properties. | | 6 | L2 | CO1 |
| | b. | Describe the canonical representation of bandpass signal. | | 7 | L2 | CO1 |
| | c. | Describe the correlation receiver with neat diagram. | | 7 | L2 | CO1 |
| OR | | | | | | |
| Q.2 | a. | Apply gram Schmidt orthogonalization procedure find the set of orthonormal basis function to represent the signals $S_1(t)$, $S_2(t)$ and $S_3(t)$ as shown in Fig.Q2(a). Also express each of these figures in terms of set of basis function. | | 10 | L3 | CO1 |
| | |  <p style="text-align: center;">Fig.Q2(a)</p> | | | | |
| | b. | Derive the equation for converting continuous AWGN channel into a vector channel. | | 10 | L2 | CO1 |
| Module – 2 | | | | | | |
| Q.3 | a. | Describe with a neat diagram, the generation and detection of BPSK signal. | | 8 | L2 | CO2 |
| | b. | Define bandwidth efficiency. Tabulate the comment on the bandwidth efficiency of M-ary PSK signal. | | 8 | L2 | CO2 |
| | c. | Encode the binary sequence using DPSK 11011011. Assume reference bit as 1. | | 4 | L2 | CO2 |
| OR | | | | | | |
| Q.4 | a. | Derive the expression for probability of error of QPSK signal. | | 8 | L2 | CO2 |
| | b. | Discuss the non-coherent detection of BFSK signal. | | 8 | L2 | CO2 |
| | c. | Calculate the average power required for a DPSK signal operation at a data rate of 1000 bit/sec, over a band-pass channel having a bandwidth of 3000 Hz, $\frac{N_0}{2} = 10^{-10}$ W/Hz probability of error $P_e = 10^{-5}$. | | 4 | L3 | CO2 |
| Module – 3 | | | | | | |
| Q.5 | a. | Define entropy and summarize its properties. | | 6 | L2 | CO3 |
| | b. | A source has five symbols $S = \{S_1, S_2, S_3, S_4, S_5\}$ with probabilities $P = \{0.4, 0.2, 0.2, 0.1, 0.1\}$ respectively. compute the source code using Huffman binary coding. Also find the average length and entropy. | | 8 | L3 | CO3 |
| | c. | Briefly discuss instantaneous code with an example. | | 6 | L2 | CO3 |
| OR | | | | | | |
| Q.6 | a. | Derive the expression for mutual information and summarize its properties. | | 10 | L2 | CO3 |
| | b. | Derive the expression for the channel capacity of binary symmetric channel. | | 10 | L3 | CO3 |

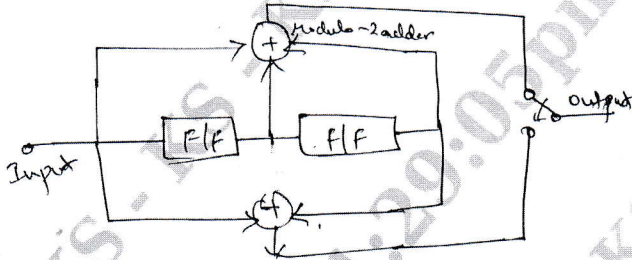
Module – 4

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|-----|----|--|---|----|-----|
| Q.7 | a. | Indicate the advantages and disadvantages of error control coding. Also differentiate between block code and convolution code. | 8 | L2 | CO4 |
| | b. | If 'C' is a valid code vector then show that $CH^T = 0$ where H is parity check matrix of code. | 5 | L2 | CO4 |
| | c. | Design an encoder for the (7, 4) binary cyclic code generated by : $g(x) = 1 + x + x^3$ for the message vector [1001]. | 7 | L3 | CO4 |

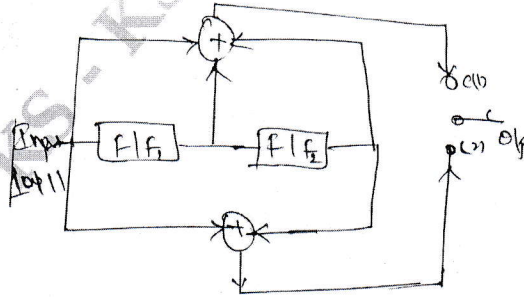
OR

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|-----|----|--|----|----|-----|
| Q.8 | a. | Describe the block diagram of generator and parity check matrix with equation. Also write the syndrome equation and list its properties. | 10 | L2 | CO4 |
| | b. | A (7, 4) Linear block code has : $P = \begin{bmatrix} 1 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix}$ i) All possible code vector ii) Determine the Hamming weight of each code word iii) If the received vector is [1100010]. Determine its syndrome correct the codeword. | 10 | L3 | CO4 |

Module – 5

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|-----|----|---|----|----|-----|
| Q.9 | a. | For a given convolutional encoder shown in Fig.Q9(a), with D = 10011. Compute output sequence using transform domain approach. Also draw the code tree diagram. | 10 | L3 | CO5 |
| | |  <p>Fig.Q9(a)</p> | 10 | L3 | CO5 |
| | b. | Describe the recursive systematic convolutional code encoder with an example. | 10 | L3 | CO5 |

OR

| | | | | | |
|------|----|---|----|----|-----|
| Q.10 | a. | A convolution encoder has two flip-flop with two states, three modulo – 2 adders and an output multiplexer. The generator sequences of the encoder. $g^{(1)} = (1, 0, 1)$, $g^{(2)} = (1, 1, 0)$, $g^{(3)} = (1, 1, 1)$. i) Generator matrix [G] ii) Draw the encoder block diagram iii) Calculate the codeword for the message input vector 11101. | 10 | L3 | CO5 |
| | b. | For a given convolution encoder shown in Fig.Q10(b). Build state table, state transaction table, sketch diagram and describe the Trellis diagram for the input message vector (10111). | 10 | L3 | CO5 |
| | |  <p>Fig.Q10(b)</p> | | | |

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Question Paper Version : B

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025
Environmental Studies and E – Waste Management

Time: 1 hr.]

[Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

1. Answer all the **fifty** questions, each question carries one mark.
2. Use only **Black ball point pen** for writing / darkening the circles.
3. **For each question, after selecting your answer, darken the appropriate circle corresponding to the same question number on the OMR sheet.**
4. Darkening two circles for the same question makes the answer invalid.
5. **Damaging/overwriting, using whiteners** on the **OMR** sheets are strictly prohibited.

-
1. What is Extended Producer Responsibility (EPR) as per the e – waste management rules in India?
 - a) The responsibility of consumer to manage e – waste
 - b) The responsibility of manufactures to manage e – waste throughout the product life cycle
 - c) The responsibility of retailers to manage e – waste disposal
 - d) The responsibility of informal recyclers to manage e – waste.
 2. Which international agreement regulates the transboundary movements of hazardous waste, including e – waste?
 - a) Kyoto Protocol
 - b) Paris agreement
 - c) Montreal Protocol
 - d) Basel convention
 3. Which colour bin is used for e – waste?
 - a) Blue
 - b) Green
 - c) Yellow
 - d) Black
 4. What are the health hazards which can be caused by E – waste?
 - a) Lung cancer
 - b) DNA damage
 - c) Brain
 - d) All of these
 5. Preparation of Guidelines for Environmentally sound Management of e – waste is a duty assigned to
 - a) Producer
 - b) Consumer
 - c) MOEFCC
 - d) SP CB/PCC
 6. What is India's global rank in e – waste?
 - a) 3
 - b) 13
 - c) 23
 - d) 33
 7. When did the Karnataka State Pollution Control Board for prevention and control of water pollution constituted?
 - a) 1974
 - b) 1978
 - c) 1982
 - d) 1986

8. Aerosol consisting of liquid droplets is called as
a) Mist b) Dust c) Fog d) Aerosol
9. Which of the following is non – point source of water pollution?
a) Factories b) Sewage treatment plant
c) Urban and suburban land d) All of these
10. When is World Water day celebrated?
a) January 26th b) June 5th c) September 22nd d) March 22nd
11. What is the Dissolved oxygen value required for the survival of aquatic species?
a) 7 mg/L b) 8.2 mg/L c) 6.5 mg/L d) 4 mg/L
12. Which among the following is used to dump the waste collected in the cities?
a) Land fills b) Ocean c) River d) All of these
13. Which type of waste includes items such as leftover food, fruit peels and yard trimmings?
a) Hazardous waste b) Organic waste
c) Bio – medical waste d) Electronic waste
14. Which of the integrated waste management is reduced on an individual level?
a) Source Reduction b) Recycling c) Disposal d) Burning
15. What is called for the process of burning municipal solid waste in a properly designed furnace under suitable temperature and operating conditions?
a) Landfill b) Recycling c) Vermicomposting d) Incineration
16. The process of decomposition of biodegradable solid waste by earthworms is called
a) Landfill b) Vermicomposting c) Composting d) Shredding
17. ____ is a liquid that passes through solid waste and extracts suspended impurities from it
a) Leachate b) Sludge c) Distilled water d) Municipal
18. The colour code of plastic bag for disposing of microbial laboratory culture waste
a) black b) red c) blue d) white
19. Average hospital waste produced per bed per day in Government hospital is
a) 1.5 to 2 kg b) 0.5 – 4 kg c) 0.5 to 1 kg d) 0.5 – 2 kg
20. Which of the following are the main contributors of the e –waste in the world?
I. Refrigerators / freezers , washing machines , dishwashers.
II. Small household appliances
III. Personal computers, telephones , laptops , printers.
IV. Gas cylinders, chimneys and home appliances
a) Only I, II, III b) Only I & II c) Only I, III , IV d) All of these
21. Veld type grasslands are located at
a) South Africa b) South America c) Australia d) Britain
22. Which pyramid is always upright?
a) Energy b) Biomass c) Numbers d) Food chain

23. In what form is solar energy is radiated from the Sun?
 - a) Ultraviolet Radiation
 - b) Infrared Radiation
 - c) Electromagnetic waves
 - d) Transverse waves
24. What does MHD stands for in the energy field?
 - a) Magneto Hydro Dynamic
 - b) Metal Hydrogen Detox
 - c) Micro Hybrid Drive
 - d) Metering Head Differential
25. The 'Miracle Material' that can turn CO₂ into liquid fuel is :
 - a) Propane
 - b) Copper
 - c) Graphene
 - d) Potassium
26. A tide whose difference between high and low tide is greatest.
 - a) Diurnal tide
 - b) Neap tide
 - c) Spring tide
 - d) Ebb tide
27. Which of the turbine can be mounted vertically and horizontally.
 - a) Pelton wheel
 - b) Kaplan turbine
 - c) Gorlov turbine
 - d) Francis turbine
28. Which type of fuel is removed from the reactor core after reaching end of core life service?
 - a) Burnt fuel
 - b) Spent fuel
 - c) Engine oil
 - d) Radioactive fuel
29. What is a fuel cell?
 - a) Converts heat energy to chemical energy
 - b) Converts heat energy to electrical energy
 - c) Converts chemical energy to electrical energy
 - d) Converts kinetic energy to heat energy
30. Which one of the following is the apex organization in our country in the field of pollution control?
 - a) Water Pollution Control Board
 - b) State Pollution Control Board
 - c) Central Pollution Control Board
 - d) Air Pollution Control Board
31. Which of the following conceptual spheres of the environment is having the least storage capacity for matter?
 - a) Atmosphere
 - b) Lithosphere
 - c) Hydrosphere
 - d) Biosphere
32. The ratio between energy flows at different points in a food chain is known as
 - a) Ecological capacity
 - b) Ecological efficiency
 - c) Ecological assimilation
 - d) Ecological potential
33. A predator is
 - a) An animal that is fed upon another animal
 - b) Animal that feeds upon both plants and animals
 - c) An animal that feeds upon another animal
 - d) A primary consumer
34. Why Rann of Kutch attracts aquatic birds in monsoon season?
 - a) Because desert land is converted to forest land
 - b) Because desert land is converted to snow
 - c) Because desert land do not convert
 - d) Because desert land is converted to salt marshes

35. Which kind of soil we can find on the surface of Thar desert?
 a) Rocky b) Moist c) Fertile d) Aeolian
36. Which of the following type of forest important for watersheds?
 a) Tropical Evergreen forests b) Tropical Deciduous forests
 c) Tropical Montana forests d) Grassland forest
37. Hot spots areas have
 a) Low density of biodiversity b) Only endangered plants
 c) High density of hot springs d) High density of biodiversity
38. Sustainable Development means
 a) meeting present needs without compromising on future needs
 b) progress of human beings
 c) balance between human needs and the ability of earth to provide the resources
 d) all of these
39. The term Alpha diversity refers to
 a) Genetic diversity b) Community and ecosystem diversity
 c) Species diversity within a community or ecosystem
 d) Diversity among the plant
40. Algae, green plants and photosynthetic bacteria are
 a) Autotrophic b) Heterotrophic c) Decomposers d) Consumers
41. _____ is caused by drinking water high in nitrates.
 a) Cholera b) Kidney problem
 c) Liver problem d) Methomoglobinemia
42. Bhopal gas tragedy took place in the year _____ and the gas responsible was _____
 a) 1964, Hydrogen fluoride b) 1974, Methyl chloride
 c) 1984, methyl ISO – cyanide d) 1994, Methyl sulphate
43. The major chemical pollutants in photochemical smog are
 a) NO, NO₂, VOC, O₃, PAN b) N₂O, NO₂, VOC, O₃, PAN
 c) NO, NO₂, VOC, O₂, PAN d) NO, N₂O₅, VOC, O₃, PAN
44. The international protocol to protect the Ozone layer is
 a) Vienna protocol b) Kyoto protocol
 c) Cartagena protocol d) Montreal protocol
45. Which is the best and the worst method of plume behavior for pollution dispersion?
 a) Lofting and fumigation b) Trapping and fanning
 c) Conning and fumigation d) Fanning and Lofting
46. What is called for a Temporary hearing loss?
 a) Temporary ear pain b) Temporary hearing problem
 c) Temporary threshold shift d) Temporary hearing shift
47. What timings loud speakers shouldn't use in public areas?
 a) 10.00 pm to 5.00 am b) 11.00 pm to 6.00 am
 c) 1.00 am to 7.00 am d) 10.00 pm to 6.00 am

48. In which section, if a person violates the noise pollution regulations , is liable for penalty according to Environmental Protection Act, 1986.
a) Section 12 b) Section 15 c) Section 18 d) Section 19
49. 'Minamata Disease' is caused due to
a) Lead b) Arsenic c) Mercury d) Cadmium
50. The process of reducing the fluoride content from water is called as
a) Chlorination b) Fluoridation
c) Defluoridation d) Fanning and Lofting

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BEC515C

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025

Data Structures using C++

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.*

| Module – 1 | | | M | L | C |
|-------------------|----|--|----|----|-----|
| Q.1 | a. | Explain four phases of software development process. | 8 | L1 | CO1 |
| | b. | Explain the following with suitable example, (i) new operator (ii) delete operator (iii) friend function (iv) virtual function | 8 | L2 | CO1 |
| | c. | Explain the properties of constructors and destructors. | 4 | L2 | CO1 |
| OR | | | | | |
| Q.2 | a. | Develop a C++ program to define base class rectangleType and the members to implement the properties of a rectangle. (i) Set Dimension (ii) Get length (iii) Get width (iv) Area (v) Perimeter (vi) Print (vii) Default constructor and constructor with parameters of the baseclass. And also define class BOXType which is delivered from the class rectangleType and implement the properties of a box. (i) Set Dimension (ii) Get Length (iii) Get Width (iv) Get Height (v) Area (vi) Volume (vii) Print (viii) Default constructor and constructor with parameters of derived class. | 12 | L1 | CO1 |
| | b. | Explain class inheritance as, (i) Public inheritance (ii) Private inheritance (iii) Protected inheritance | 8 | L1 | CO1 |
| Module – 2 | | | | | |
| Q.3 | a. | Consider the linked list shown in Fig. Q3 (a). Assume that the nodes are in the usual info-link form. Find the output of each of the following C++ statements. <div style="text-align: center;"> </div> <div style="text-align: center;">Fig. Q3 (a)</div> <div style="list-style-type: none;"> <div>(i) Current</div> <div>(ii) Current → info</div> <div>(iii) Current → link</div> <div>(iv) Current → link → info</div> <div>(v) Head → link → link</div> <div>(vi) Head → link → link → info</div> <div>(vii) Head → link → link → link</div> <div>(viii) Current → link → link → link</div> <div>(ix) Current → link → link → link → info</div> </div> | 5 | L1 | CO2 |

| | | | | | |
|-------------------|-----------|---|----|----|-----|
| | b. | Define a class stackADT, which performs basic operations of stack: (i) Initialize stack (ii) isEmptyStack (iii) isFullStack (iv) push (v) top (vi) pop | 10 | L2 | CO2 |
| | c. | Write difference between arrays and linked lists. | 5 | L2 | CO2 |
| OR | | | | | |
| Q.4 | a. | (i) Define a class orderedLinkedList, which specifies the members to implement the basic properties of linked list. (ii) Draw the UML class diagram, of the class orderedLinkedList and inheritance hierarchy. | 6 | L1 | CO2 |
| | b. | Write a C++ code, to insert an item in an ordered linked list. | 6 | L2 | CO2 |
| | c. | Implement basic operation on a stack as linked list. | 8 | L3 | CO2 |
| Module – 3 | | | | | |
| Q.5 | a. | Define a queue and explain various queue operations. | 7 | L1 | CO3 |
| | b. | Explain the working of binary search algorithm. | 8 | L1 | CO3 |
| | c. | Define the following functions for queue, (i) Initialize queue. (ii) Delete queue | 5 | L2 | CO3 |
| OR | | | | | |
| Q.6 | a. | Define the following hash functions : (i) Mid-square (ii) Folding (iii) Division | 6 | L1 | CO3 |
| | b. | Explain various collision resolution techniques. | 10 | L1 | CO3 |
| | c. | Write a C++ program to implement selection sort. | 4 | L2 | CO3 |
| Module – 4 | | | | | |
| Q.7 | a. | Define : (i) Binary tree (ii) Use struct to define a node of a binary trees. (iii) Level of a node. (iv) Height of a binary tree. | 5 | L1 | CO4 |
| | b. | Explain three different binary tree traversals in detail. | 10 | L2 | CO4 |
| | c. | Write an algorithm for non-recursive post order traversal. | 4 | L3 | CO4 |
| OR | | | | | |
| Q.8 | a. | Define a class binarysearchtree, and implement the following operations : (i) Insert (ii) Delete | 10 | L1 | CO4 |
| | b. | What is a B-tree of order m and explain its properties and explain an algorithm to insert an item in a B-tree. | 10 | L3 | CO4 |
| Module – 5 | | | | | |
| Q.9 | a. | Explain how to represent a graph in computer memory. | 10 | L1 | CO5 |
| | b. | Explain shortest path algorithm in detail. | 10 | L1 | CO5 |
| OR | | | | | |
| Q.10 | a. | Explain Prim's minimum spanning tree algorithm. | 10 | L2 | CO5 |
| | b. | Explain Eulers circuits. | 4 | L2 | CO4 |
| | c. | Explain Breadth first topological ordering algorithm. | 6 | L2 | CO4 |

CBCS SCHEME

USN

1 K S 2 3 A I 4 0 2

BRMK557

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025

Research Methodology and IPR

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. M : Marks , L: Bloom's level , C: Course outcomes.

| Module – 1 | | | M | L | C |
|------------|----|--|----|----|-----|
| Q.1 | a. | Identify the meaning of Research and brief out the objective and motivation in engineering research. | 10 | L1 | CO1 |
| | b. | Explain brief about research cycle and verify with the research flow diagram. | 10 | L1 | CO1 |
| OR | | | | | |
| Q.2 | a. | Identify the types of engineering research and briefly explain them. | 10 | L1 | CO1 |
| | b. | Explain about the different types of research misconduct. | 10 | L1 | CO1 |
| Module – 2 | | | | | |
| Q.3 | a. | Explain about the importance of literature review and technical reading. | 10 | L2 | CO2 |
| | b. | Mention the various benefits of bibliographic databases. | 10 | L1 | CO2 |
| OR | | | | | |
| Q.4 | a. | Identify the impact of technical reaction and brief about it. | 10 | L1 | CO2 |
| | b. | Enumerate the impact of title and keywords on citation with example. | 10 | L2 | CO2 |
| Module – 3 | | | | | |
| Q.5 | a. | Define Intellectual properties and explain about its types. | 10 | L1 | CO3 |
| | b. | Explain about the key aspect of patent law. | 10 | L2 | CO3 |
| OR | | | | | |
| Q.6 | a. | Explain about the assessment of novelty. | 10 | L1 | CO3 |
| | b. | Brief about the patent procedure in India. | 10 | L1 | CO4 |
| Module – 4 | | | | | |
| Q.7 | a. | Mention and brief about the justification for copyright law. | 10 | L2 | CO4 |
| | b. | Explain about the basic concepts of under lying copyright law. | 10 | L1 | CO4 |
| OR | | | | | |
| Q.8 | a. | Brief about the various representations of sound recordings. | 10 | L2 | CO5 |
| | b. | Explain about TRIPS agreement in detail. | 10 | L1 | CO5 |

| Module – 5 | | | | | |
|------------|----|--|----|----|-----|
| Q.9 | a. | Explain about the justification of protection designs. | 10 | L2 | CO5 |
| | b. | Brief about the excluded subjected matter in the context of design protection. | 10 | L1 | CO5 |
| OR | | | | | |
| Q.10 | a. | What are the rights of the owner of designs? Explain. | 10 | L1 | CO5 |
| | b. | Brief about the Assignment of Design Rights. | 10 | L1 | CO5 |
