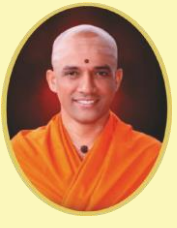




|| Jai Sri Gurudev ||



BGSKH Education Trust(R.) - A unit of Sri Adichunchanagiri Shikshana Trust(R.)

BGS College Of Engineering and Technology



VTU – Dec. 2023 /Jan. 2024 – 5th Sem Question Papers

2022 - Scheme





2022-Scheme - Dec.2025/Jan.2026

Theory Question Papers for 5th Semester

Sl.No	Name of the Subject	Subject Code
1	Software Engineering and Project Management	BCS501
2	Computer Network	BCS502
3	Theory of Computation	BCS503
4	Data Warehousing	BAD515B
5	Artificial Intelligence	BCS515B
6	Cloud Computing	BAD515C
7	Exploratory Data Analysis	BA151E
8	Research Methodology and IPR	BRMK557
9	Environmental Studies and E - Waste Management	BCS508

CBCS SCHEME

BCS501

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Fifth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026 Software Engineering and Project Management

Max. Marks: 100

Time: 3 hrs.

*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 domains of software applications.	08	L2	CO1
	b.	Outline the unique nature of WebApps.	08	L2	CO1
	c.	Explain various software myths. Discuss.	04	L2	CO1
OR					
Q.2	a.	Explain the activities performed in a software process framework?	06	L2	CO1
	b.	Explain the waterfall model along with its pros and cons.	08	L2	CO1
	c.	Explain specialized process models.	06	L2	CO1
Module – 2					
Q.3	a.	Explain how groundwork parameters are established in requirements engineering.	08	L2	CO2
	b.	What is the importance of quality function deployment in eliciting requirements?	06	L1	CO2
	c.	How can we validate requirements?	06	L1	CO2
OR					
Q.4	a.	Explain about scenario based modelling.	10	L2	CO2
	b.	Illustrate regarding how can we create a Behavioral Model.	10	L2	CO2
Module – 3					
Q.5	a.	Explain Agility along with the principles of Agility.	10	L2	CO3
	b.	Explain the Extreme Programming Process.	06	L2	CO3
	c.	Explain about the critics of XP.	04	L2	CO3
OR					
Q.6	a.	Explain the scrum flow process.	08	L2	CO3
	b.	Explain the communication principles guiding framework activity.	08	L2	CO3
	c.	How can we validate and test principles in coding.	04	L1	CO3
Module – 4					
Q.7	a.	Define Project. Show the contrast of software projects with other types of projects.	06	L2	CO4
	b.	Explain the ISO 12207 software development life cycle with a neat diagram.	10	L2	CO4
	c.	What are outsourced projects?	04	L1	CO4
OR					
Q.8	a.	Illustrate the cost benefit evaluation techniques.	10	L2	CO4
	b.	Illustrate the concept of Risk evaluation.	10	L2	CO4
Module – 5					
Q.9	a.	Explain the details to be drafted for achieving quality in software.	06	L2	CO5
	b.	Explain the software quality characteristics of ISO 9126.	08	L2	CO5
	c.	Explain process requirements for the process quality management.	06	L2	CO5
OR					
Q.10	a.	Explain about the decomposition techniques.	10	L2	CO5
	b.	Explain the COCOMO II model.	10	L2	CO5

OR

Q.6	a.	Explain IPv6 packet format in detail.	6	L2	CO2
	b.	Discuss D-V routing highlighting the importance of distance vector.	7	L2	CO2
	c.	Describe BGP protocol in detail.	7	L2	CO4

Module – 4

Q.7	a.	Explain the concept of port numbers mentioning ICANN ranges.	5	L2	CO3
	b.	Explain Go-Back-N protocol.	9	L2	CO4
	c.	Explain TCP segment format with a neat diagram.	6	L3	CO3

OR

Q.8	a.	Discuss the connection establishment in TCP.	8	L2	CO3
	b.	Explain error control in TCP using acknowledgements.	4	L2	CO3
	c.	Discuss three algorithms for handling congestion in TCP.	8	L2	CO3

Module – 5

Q.9	a.	Discuss application layer paradigms with neat diagram.	5	L2	CO3
	b.	Explain the use of sockets in process-to-process communication.	7	L2	CO3
	c.	Discuss the connection types in HTTP along with formats of messages.	8	L2	CO3

OR

Q.10	a.	Explain POP and IMAP protocols.	8	L2	CO4
	b.	Discuss the applications of SSH protocol.	4	L2	CO4
	c.	Explain resolution in DNS.	8	L2	CO3

CBCS SCHEME

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BCS503

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026

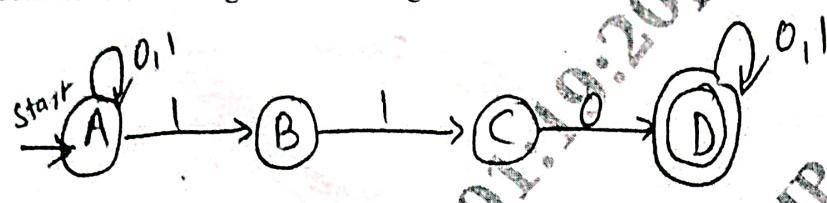
Theory of Computation

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.	Define the following with example: i) Alphabet ii) String iii) Power of an Alphabet iv) Language v) Problem	05	L2	CO1																											
	b.	Design DFA for the following languages. i) DFA to accept string of 0's, 1's and 2's beginning with a '0' followed by odd number of 1's and ending with a '2'. ii) $L = \{ W \in \{0,1\}^* : w \text{ does not have } 001 \text{ as a substring} \}$	08	L3	CO1																											
	c.	Convert the following NFA to DFA.	07	L3	CO1																											
OR																																
Q.2	a.	Design an NFA to recognize the following set of strings 0101, 101 and 011.	05	L2	CO1																											
	b.	Design an DFA to accept binary numbers divisible by 5.	08	L3	CO1																											
	c.	Obtain DFA for the following ϵ -NFA	07	L3	CO1																											
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$\rightarrow p$	ϕ	{p}	{q}	{r}																												
q	{p}	{q}	{r}	ϕ																												
*r	{q}	{r}	ϕ	{p}																												
Module - 2																																
Q.3	a.	Write the Regular Expression for the following languages. i) $L = \{ a^n b^m \mid n \geq 4, m \leq 3 \}$ ii) RE to accept words with two or more letters but beginning and ending with the same letter where $\Sigma = \{ a, b \}$	06	L3	CO2																											
	b.	Obtain ϵ -NFA for given Regular Expression $(a + b)^* aa (a + b)^*$	06	L3	CO2																											
	c.	Find the minimized DFA of the following	08	L3	CO2																											
<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>δ</th> <th>a</th> <th>b</th> </tr> </thead> <tbody> <tr> <td>$\rightarrow A$</td> <td>B</td> <td>F</td> </tr> <tr> <td>B</td> <td>G</td> <td>C</td> </tr> <tr> <td>*C</td> <td>A</td> <td>C</td> </tr> <tr> <td>D</td> <td>C</td> <td>G</td> </tr> <tr> <td>E</td> <td>H</td> <td>F</td> </tr> <tr> <td>F</td> <td>C</td> <td>G</td> </tr> <tr> <td>G</td> <td>G</td> <td>E</td> </tr> <tr> <td>H</td> <td>G</td> <td>C</td> </tr> </tbody> </table>						δ	a	b	$\rightarrow A$	B	F	B	G	C	*C	A	C	D	C	G	E	H	F	F	C	G	G	G	E	H	G	C
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BCS503			
OR			
Q.4	a.	State and prove pumping theorem for regular languages. Show that the language $L = \{a^n b^n \mid n \geq 0\}$ is not regular.	06 L3 CO2
	b.	Convert the following FA to RE using state elimination method. 	06 L3 CO2
	c.	Prove that the Regular Languages are closed under : i) Union ii) Complementation iii) Intersection iv) Difference	08 L3 CO2
Module - 3			
Q.5	a.	Design CFG for the following Languages. i) $L = \{ww^R \mid w \in \{a, b\}^*\}$ ii) $L = \{0^m 1^m 2^n \mid m \geq 1 \text{ and } n \geq 0\}$ iii) $L = \{a^n b^{n+3} \mid n \geq 0\}$	10 L3 CO3
	b.	Consider the grammar G with productions $S \rightarrow aSbS \mid bSaS \mid \epsilon$ Obtain LMD, RMD and parse tree for the string aababb. Is the grammar ambiguous.	10 L3 CO3
OR			
Q.6	a.	Obtain PDA to accept the language $L = \{wCw^R \mid w \in (a+b)^*\}$ and show the moves made by the PDA for the string aabCbaa.	10 L3 CO3
	b.	Convert the following CFG to PDA $S \rightarrow aABC$ $A \rightarrow aB \mid a$ $B \rightarrow bA \mid b$ $C \rightarrow a$	10 L3 CO3
Module - 4			
Q.7	a.	Define CNF. Convert the following CFG to CNF $E \rightarrow E + T \mid T$ $T \rightarrow T * F \mid F$ $F \rightarrow (E) \mid 1$ $I \rightarrow Ia \mid Ib \mid a \mid b$	10 L3 CO4
	b.	State and prove pumping lemma for context Free Grammars. Show that $L = \{0^n 1^n 2^n \mid n \geq 1\}$ is not context free.	10 L3 CO4
OR			
Q.8	a.	Define CNF convert the following CFG to CNF $S \rightarrow AB$ $A \rightarrow aA \mid bB \mid b$ $B \rightarrow b$	10 L3 CO4
	b.	Prove that the context free languages are closed under i) Union ii) Concatenation iii) Homomorphism	10 L3 CO4
Module - 5			
Q.9	a.	Define a Turing Machine. Explain the working of a basic Turing machine with neat diagram.	08 L2 CO5
	b.	Design a Turing Machine to accept the language $L = \{a^n b^n c^n \mid n \geq 1\}$. Draw the transition diagram and show the moves made by TM for the string : aabbcc.	12 L3 CO5
OR			
Q.10	a.	What are the programming Techniques for Turing Machine. Explain.	10 L2 CO5
	b.	Write short notes on : i) Multi-Tape Turing Machine ii) Non-Deterministic Turing Machine	10 L2 CO5

CBCS SCHEME

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BAD515B

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026 Data Warehousing

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 strategies information and explain five types of strategic objectives.	10	L2	CO1
	b.	Explain technology trends for explosive growth of information technology.	10	L2	CO1
OR					
Q.2	a.	Explain the role of metadata, including the source data component and data storage component.	10	L2	CO1
	b.	Describe the management and control component of a data warehouse and information delivery component.	10	L2	CO1
Module – 2					
Q.3	a.	List and explain any four of the development phases in the life cycle of a data warehouse.	10	L3	CO2
	b.	What are the roles and responsibilities of the project team in a data warehouse project?	10	L2	CO2
OR					
Q.4	a.	Describe the key business metrics or facts in dimensional analysis.	10	L3	CO2
	b.	Explain the process of requirements gathering and its significance in the data warehouse lifecycle.	10	L2	CO2
Module – 3					
Q.5	a.	Discuss the components of the architectural framework of a data warehouse.	10	L3	CO3
	b.	Explain the infrastructure required to support a data warehouse architecture.	10	L3	CO3
OR					
Q.6	a.	What is Metadata? Why it is critical in data warehousing? Describe the types of metadata.	10	L3	CO3
	b.	Identify the significance of business metadata and technical metadata in data warehousing.	10	L3	CO3

Module - 4

Q.7	a.	What is STAR Schema? Analyze the star schema with example.	10	L4	CO4
	b.	Explain the concept of aggregate fact tables in dimensional modeling and their use.	10	L4	CO4

OR

Q.8	a.	What is ETL Process? Outline its key steps and importance in data warehousing.	10	L4	CO4
	b.	Explain the significance of metadata in the ETL process and its management.	10	L4	CO4

Module - 5

Q.9	a.	Why is data quality critical for the success of a data ware house? Discuss its challenges.	10	L2	CO5
	b.	Explain the tools available for ensuring data quality in a data warehouse.	10	L2	CO5

OR

Q.10	a.	Discuss the major features and functions of OLAP in a data warehousing.	10	L2	CO5
	b.	Explain the significance of a web-enabled data warehouse in modern enterprises.	10	L2	CO5

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BCS515B

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026

Artificial Intelligence

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 Alan Turing's significant contribution to artificial intelligence and give a brief introduction to the Turing Test in AI.	10	L2	CO1	
	b.	Define agent, agent function and agent program. Explain with a neat diagram how agent interacts with environment through sensors and actuators.	10	L1	CO1	
OR						
Q.2	a.	List the types of Agents. Explain Goal Based and utility based agent with neat diagram.	10	L2	CO1	
	b.	Compare and contrast between i) Deterministic and Stochastic ii) Static and Dynamic iii) Episodic and Sequential iv) Fully observable and partially observable. Give example for each of the nature of environment given above.	10	L2	CO1	
Module - 2						
Q.3	a.	Explain the tree search and graph search algorithms.	10	L2	CO2	
	b.	Explain problems solving agents along with algorithm and illustrate the incremental formulation of 8-Queens problem.	10	L2	CO2	
OR						
Q.4	a.	List and explain the criteria to measure the performance of search strategies.	10	L2	CO2	
	b.	Explain Breadth first search technique as a problem solving strategy with its benefits and shortcomings.	10	L2	CO2	
Module - 3						
Q.5	a.	Explain A* algorithm for shortest path and apply the same for the below graph.	10	L3	CO3	

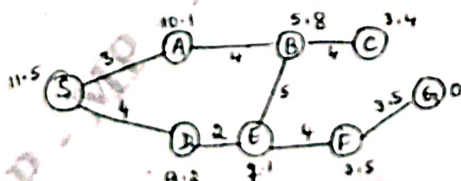


Fig Q5(a)

	b.	Apply heuristic search algorithm on the given 8 puzzle problem to reach the goal state from the initial state	10	L3	CO3																			
		<table style="display: inline-table; margin-right: 20px;"> <tr><td>1</td><td>2</td><td>3</td></tr> <tr><td></td><td>4</td><td>6</td></tr> <tr><td>7</td><td>5</td><td>8</td></tr> </table> Start state	1	2	3		4	6	7	5	8	<table style="display: inline-table;"> <tr><td>1</td><td>2</td><td>3</td></tr> <tr><td>4</td><td>5</td><td>6</td></tr> <tr><td>7</td><td>8</td><td></td></tr> </table> Goal state	1	2	3	4	5	6	7	8				
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	4	6																						
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OR																								
Q.6	a.	Define knowledge based agent. Outline the knowledge based agent program.	10	L1	CO3																			
	b.	Define Propositional Logic. Explain syntax and semantics.	10	L1	CO3																			
Module - 4																								
Q.7	a.	Explain first order logic with its syntax in BNF form.	10	L2	CO4																			
	b.	Explain Quantifiers. Differentiate between Universal and Existential Quantifier.	10	L2	CO4																			
OR																								
Q.8	a.	Illustrate Kinship Domain with an example.	10	L2	CO4																			
	b.	Illustrate unification algorithm used for reasoning with example.	10	L2	CO4																			
Module - 5																								
Q.9	a.	Outline the backward chaining algorithm for definite clauses. Construct a proof tree to prove that "west is a criminal".	10	L2	CO5																			
	b.	Apply Resolution for "west is a criminal" and "curiosity killed the cat" example.	10	L3	CO5																			
OR																								
Q.10	a.	Define Planning. Explain block world problem for the following start state and End state.	10	L2	CO5																			
		<table style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;"> <table border="1" style="border-collapse: collapse;"> <tr><td style="padding: 2px;">B</td><td style="padding: 2px;">A</td></tr> <tr><td style="padding: 2px;">C</td><td style="padding: 2px;"></td></tr> </table> Start state </td> <td style="text-align: center; padding: 0 20px;"> → </td> <td style="text-align: center;"> <table border="1" style="border-collapse: collapse;"> <tr><td style="padding: 2px;">A</td><td style="padding: 2px;"></td></tr> <tr><td style="padding: 2px;">B</td><td style="padding: 2px;"></td></tr> <tr><td style="padding: 2px;">C</td><td style="padding: 2px;"></td></tr> </table> Goal state </td> </tr> </table>	<table border="1" style="border-collapse: collapse;"> <tr><td style="padding: 2px;">B</td><td style="padding: 2px;">A</td></tr> <tr><td style="padding: 2px;">C</td><td style="padding: 2px;"></td></tr> </table> Start state	B	A	C		→	<table border="1" style="border-collapse: collapse;"> <tr><td style="padding: 2px;">A</td><td style="padding: 2px;"></td></tr> <tr><td style="padding: 2px;">B</td><td style="padding: 2px;"></td></tr> <tr><td style="padding: 2px;">C</td><td style="padding: 2px;"></td></tr> </table> Goal state	A		B		C										
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B	A																							
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	b.	Illustrate how planning graph data structure can be used to give a better heuristic for a planning problem.	10	L2	CO5																			

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BAD515C

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026

Cloud Computing

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 concept of multicore CPU's with the memory hierarchy.	5	L2	CO1
	b.	Explain the concept of "System Availability". When a given system is said to be more reliable?	5	L2	CO1
	c.	Identify how the GPU computing contributed to the advancement of high performance computing and what are the key challenges and innovations necessary to achieve exascale computing and beyond.	10	L3	CO1
OR					
Q.2	a.	Explain the concept of multithreading by considering any 2 micro architectures present in the modern CPU.	5	L2	CO1
	b.	What is Service-Oriented Architecture (SOA) and what are its core principles?	5	L2	CO1
	c.	Identify how the advancements in parallel processing and distributed computing contributed to the evolution of High-performance computing and high-throughput computing system? Give the examples of how these systems have adapted to meet modern computational needs?	10	L3	CO1
Module - 2					
Q.3	a.	Apply the concept of virtualization to a data center consolidation scenario where resource utilization is low. Explain how different levels of virtualization could be implemented to increase efficiency.	10	L3	CO2
	b.	Explain hardware assisted virtualization concept by considering Intel X86 processor.	6	L2	CO2
	c.	What is Full Virtualization and Para Virtualization?	4	L2	CO2
OR					
Q.4	a.	In a cloud service environment needing high availability, how live migration could be applied to ensure minimal service interruption. Include the role of memory, file systems and network migration in maintaining service continuity?	10	L3	CO2
	b.	Explain the concept of encapsulation for virtual networking of private cloud.	6	L2	CO2
	c.	What is a Hypervisor? Explain the Xen Hyper visor architecture with Domain O and Domain U?	4	L2	CO2

BAD515C					
Module – 3					
Q.5	a.	Explain the Architectural Design challenges in cloud architecture development.	10	L2	CO3
	b.	Explain Private, Public and Hybrid clouds with example.	6	L2	CO3
	c.	Explain the standard data center networking structure to access the internet.	4	L2	CO3
OR					
Q.6	a.	What are the criteria/requirements to be considered while designing the data center inter connection networks? Explain the FAT-tree interconnection topology used for data-center construction.	10	L2	CO3
	b.	Describe with diagram how the cooling system works in a raised floor data center using hot-cold air circulation?	6	L2	CO3
	c.	Explain the different Resource Provisioning Methods.	4	L2	CO3
Module – 4					
Q.7	a.	Explain the concept of XOAR with neat diagram and list the design goals of XOAR.	10	L2	CO4
	b.	Explain the concept of distributed defense against DDOS flooding attacks and man-in-the middle attacks.	10	L2	CO4
OR					
Q.8	a.	Explain the concept of virtual machine security services provided by the hypervisor and dedicated VM providing security with TCB (Trusted Computing Base).	10	L2	CO4
	b.	Explain the different security challenges for mobile devices in cloud environment. List out the unique security threats affecting mobile devices and the reasons for these security risks.	10	L2	CO4
Module – 5					
Q.9	a.	Explain the Google File Systems (GFS) with its Architecture and Data mutation sequence in GFS.	10	L2	CO5
	b.	Explain the process of Amazon EC2 programming and Amazon Simple Storage Service (S3).	10	L2	CO5
OR					
Q.10	a.	With formal definition of Map Reduce, Explain the Map Reduce framework and Map Reduce Logical Data Flow.	10	L2	CO5
	b.	Explain Dryad framework and its job structure, control and dataflow.	10	L2	CO5

CBCS SCHEME

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BAI515E

Fifth Semester B.E/B.Tech. Degree Examination, Dec.2025/Jan.2026
Exploratory Data Analysis

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.	What is Exploratory Data Analysis? Explain different NumPy array attributes with an example.	5	L1	CO1
	b.	Illustrate NumPy array indexing and slicing operations.	10	L1	CO1
	c.	Explain np.sort(), np.argsort(), and sorting long rows and columns with an example.	5	L1	CO1
OR					
2	a.	Describe partitioning with an example.	5	L2	CO1
	b.	Illustrate different approaches for structured array creation.	10	L2	CO1
	c.	Give character representation and description of NumPy datatypes.	5	L2	CO1
Module – 2					
3	a.	What is a Series? Explain the different ways of constructing series objects.	5	L2	CO2
	b.	What is a DataFrame? Explain the different ways of constructing DataFrame objects.	10	L2	CO2
	c.	With an example, explain fillna().	5	L2	CO2
OR					
4	a.	Explain operating on null values.	5	L1	CO2
	b.	Explain different methods for multiindex creation, with an example.	10	L2	CO2
	c.	Explain the concept of Indexing and Slicing a MultiIndex.	5	L2	CO2
Module – 3					
5	a.	Explain shifting and windowing.	5	L2	CO3
	b.	Explain lower(), len(), startswith(), split() and capitalize() string functions with an appropriate example.	10	L2	CO3
	c.	Explain any 3 methods that uses regular expressions, with an example.	5	L2	CO3

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OR					
6	a.	Explain eval function for column-wise operations.	5	L3	CO3
	b.	Describe fundamental Pandas data structures for working with time series data.	10	L3	CO3
	c.	Describe the following with an example : i) extract ii) findall.	5	L3	CO3
Module – 4					
7	a.	Illustrate the following : i. Labeling plots ii. Adjusting plot axis limit.	10	L3	CO4
	b.	What do you mean by scatter plot? Describe 2 approaches for plotting scatter plot.	10	L4	CO4
OR					
8	a.	Illustrate the following : i. Categorical plots ii. Bar plots.	10	L3	CO4
	b.	Describe how effectively uncertainties or errors visualized through plot.	10	L4	CO4
Module – 5					
9	a.	What is Machine Learning? What are the different categories of ML? Explain.	10	L4	CO5
	b.	Explain the guidelines followed in designing Scikit-Learn API? And also describe the steps in using the Scikit-Learn Estimator API.	10	L5	CO5
OR					
10	a.	Explain the following supervised/unsupervised learning example by using Scikit-Learn. i. Iris classification ii. Iris dimensionality.	10	L4	CO5
	b.	Explain how cross-validation is used to validate the model.	10	L5	CO5

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BRMK557

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026

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.	Define the term Research. Explain the research flow cycle with the help of a neat diagram.	07	L2	CO1
	b.	Interpret the factors that motivate Engineering Research.	07	L2	CO1
	c.	With the help of neat diagram, recall the 3 broad categories of developing and accessing knowledge in research.	06	L1	CO1
OR					
Q.2	a.	What do you mean by Ethics? Recall the importance of practicing ethics in engineering research.	07	L1	CO1
	b.	Write short notes on the following: i) Fabrication ii) Plagiarism	08	L2	CO1
	c.	Explain in brief the 3 ways to credit the Research Contributions.	05	L2	CO1
Module - 2					
Q.3	a.	Explain briefly the goals of conducting literature review in academic research.	10	L2	CO2
	b.	Explain how existing knowledge will act as a foundation for new knowledge.	10	L2	CO2
OR					
Q.4	a.	Define Citation. Mention and explain the types of citations which fail to achieve their goals in benefiting the reader.	10	L2	CO2
	b.	With the help of neat diagram, illustrate how knowledge flows through a citation network.	10	L2	CO2
Module - 3					
Q.5	a.	What is Intellectual Property? Discuss the role of IP in economic and cultural development of the society.	10	L2	CO1
	b.	List the type of inventions which are eligible for patenting and which are not patentable?	10	L1	CO3

BRMK557

OR

Q.6	a.	Define the term Patent. List and explain the conditions that must be met for obtaining a patent protection.	10	L2	CO3
	b.	With the help of neat diagram, explain the process of patenting an invention.	10	L2	CO3
Module – 4					
Q.7	a.	What is Copy Right? Explain the criteria that a work must meet to qualify for Copy Right Protection.	10	L2	CO4
	b.	With the help of flowchart, explain the important steps involved in the process of copy right registration.	10	L2	CO4
OR					
Q.8	a.	What is a Trademark? Explain eligibility criterias for trademark and designation of Trademark Symbols.	10	L2	CO4
	b.	With the help of neat flowchart, explain the process of trademark registration.	10	L2	CO4
Module – 5					
Q.9	a.	What is an Industrial Design? Explain the procedure for registering an industrial design.	10	L2	CO5
	b.	Explain the classification of Industrial Design.	10	L2	CO5
OR					
Q.10	a.	What is GI? Explain the mechanism available for the protection of rights related to GI.	10	L2	CO5
	b.	Discuss the case study of curcuma (turmeric) patent.	10	L2	CO5

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Question Paper Version : B

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026
Environmental Studies and E – Waste Management

Time: 1 hr.

Max. Marks: 50

INSTRUCTIONS TO THE CANDIDATES

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

- What percentage of e-waste is typically recycled Globally?
 a) 10% b) 20% c) 40% d) 60%
- What is the first step in the e-waste recycling process?
 a) Shredding b) Sorting c) Melting d) Crushing
- Which component often contain valuable metals like Gold, Silver and Copper?
 a) Printed circuit boards b) Glass screens c) Power cords d) All of these
- What are the health hazards which can caused by e-waste?
 a) Lung cancer b) DNA Damage c) Brain d) All of these
- Where should syringe Disposed?
 a) Pharma pail b) Sharps container c) Gray tote d) Red pail
- Which is the hazardous pollutant which can caused by e-waste, released from electron?
 a) Arsenic b) Barium c) Cadmium d) Cobalt
- Where should blood product pack to dispose?
 a) Gray tote/yellow pail b) Regular waste c) Pharma pail d) Red pail
- Which one is Municipal Solid Waste?
 a) Toxic b) Hazardous c) Non-Toxic d) Non-Hazardous
- Nickel is released from _____
 a) Display b) Calculator c) Alloy d) None of these

Ver – B I of 4

- BCSS508
- Which is the hazardous pollutant occurs in plastic?
 a) Lithium b) PCB's c) Lead d) Copper
 - Which of the following is an air pollutant?
 a) Carbon b) Oxygen c) Nitrogen d) Particulate matter
 - Demography is the study of
 a) Animals behaviour b) Population growth c) None of these d) River
 - The urban solid waste is known as
 a) Garbage b) Rubbish c) Refuge d) Silt
 - Activated sludge process is
 a) Anaerobic method b) Aerobic method c) Land filling d) Both a) and b)
 - Which toxic component not found in e-waste
 a) Mercury b) Cadmium c) Neon d) Lead
 - Disposal of Bio-medical waste is by
 a) Autoclave and land filling b) Incineration c) Landfilling d) Both a) and b)
 - What does e-waste stands for
 a) Environment waste b) Equipment waste c) None of these d) Electronic waste
 - Which country produces maximum e-waste per year
 a) India b) USA c) China d) France
 - What is the hazardous pollutant released in LED's?
 a) Barium b) Arsenic c) Cobalt d) Cadmium
 - Under the E-Waste Management Rules 2016, who is responsible for the collection of e-waste from end-users
 a) Retailer b) Manufacturers c) Bulk consumers d) Informal cycles
 - Blue baby syndrome is caused by contamination of water due to
 a) Phosphates b) Sulphur c) Arsenic d) Nitrates
 - Major source of Fluoride is
 a) River water b) Ground water c) Food products d) Tooth paste
 - Out of the following Nutrients in Fertilizer which one causes minimum water pollution
 a) Nitrogen b) Phosphorous c) Potassium d) Organic matter
 - Excess fluorides in drinking water is likely to cause
 a) Blue babies b) Fluorosis c) Taste and odour d) Intestinal irritation
 - Disinfection of water is used to remove
 a) Bacteria b) Odour c) Turbidity d) Colour

Ver – B 2 of 4

26. Brackish water is found in
 a) Estuaries b) Salt lake c) Polar ice caps d) Both a) and b)
27. Which one of the following is not a renewable energy?
 a) Fossil Fuels b) Solar energy c) Wind energy d) Tidal wave energy
28. Natural gas consists mainly of
 a) Ethane b) Propane c) Butane d) Methane
29. Which of the following is considered as an alternate promising Fuel?
 a) CNG b) Kerosene c) Coal d) Petrol
30. Bio mass consists of
 a) Lignin b) Hemicellulose c) Cellulose d) All of these
31. Which of the following conceptual spheres of the environment is having the least storage capacity of matter?
 a) Atmosphere b) Lithosphere c) Hydrosphere d) Biosphere
32. In an eco-system, the flow of energy is
 a) Bidirectional b) Cyclic c) Unidirectional d) Multi Directional
33. Which of the following is not a prominent Chemical responsible for a good habitat?
 a) Oxygen b) Carbon dioxide c) SO₂ d) Nutrients
34. In complex eco-systems, the degree of species Diversity is
 a) Poor b) Medium c) High d) None of these
35. World Environment day is on
 a) 5th May b) 5th June c) 18th July d) 14th August
36. Abiotic component includes
 a) Soil b) Temperature c) Water d) All of these
37. The sequence of eating and being eaten in an ecosystem is
 a) Food chain b) Carbon cycle c) Water cycle d) Anthropoco system
38. The organisms which directly feed on producer called
 a) Herbivores b) Carnivores c) Omnivores d) Decomposer
39. In an eco-system biological cycling of materials is maintains by
 a) Producer b) Consumer c) Decomposer d) All of these
40. Which pyramid is always upright
 a) Energy b) biomass c) Numbers d) Food chain
41. Nuclear power is being produced from
 a) Carbon - 14 b) Uranium c) Petroleum combustion d) Natural gas
42. Direct conversion of solar energy is attained by
 a) Solar Photo voltaic system b) Solar diesel hybrid system c) Solar thermal system d) Solar air heater

43. Pollutant waste water discharged from industries is known as
 a) Effluent b) Sludge c) Pathogens d) Contaminant
44. Anaerobiosis makes water
 a) Clear b) Muddy c) Red d) Brownish or blackish
45. Which of the following is causes Eutrophication
 a) Nitrates b) Phosphates c) Heavy metals d) Both a) and b)
46. The word pollution is derived from the latin word
 a) Pollute b) Pollutant c) Pollure d) Poly- tant
47. Which of the following are non-bio degradable?
 a) Plastics b) Domestic sewage c) detergent d) a) and c)
48. Which of the following is secondary air pollutant?
 a) Carbon monoxide b) Ozone c) Sulphur dioxide d) Carbon dioxide
49. Minamata Disease is caused due to
 a) Lead b) Arsenic c) Mercury d) Cadmium
50. Increase in asthma attacks has been linked to high level of
 a) Nitrogen b) Oxygen c) Air-borne particles d) All of these