

CBCS SCHEME

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BCS501

Fifth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 Software Engineering and Project Management

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 software process and software engineering practices.	10	L2	CO1
	b.	Explain the waterfall model and incremental model, with diagram.	10	L2	CO1
OR					
Q.2	a.	Explain Boehm Spiral process model with a neat diagram. Mention its advantages and disadvantages.	10	L2	CO1
	b.	Explain the five activities of a generic process framework for software engineering.	10	L2	CO1
Module – 2					
Q.3	a.	Explain the distinct tasks of requirement engineering.	10	L2	CO2
	b.	Illustrate the UML use case diagram for safe home system.	10	L2	CO2
OR					
Q.4	a.	Explain Class-Responsibility-Collaborator(CRC) modeling and data modeling with an example.	10	L2	CO2
	b.	Explain the elements of analysis model in requirement modeling.	10	L2	CO2
Module – 3					
Q.5	a.	Explain the principles of agile process development.	10	L2	CO3
	b.	Explain the following : i) Adaptive software development ii) SCRUM	10	L2	CO3
OR					
Q.6	a.	Explain the concepts of extremes programming with a neat diagram.	10	L2	CO3
	b.	Explain design modeling principles that guide the respective framework activity.	10	L2	CO3
Module – 4					
Q.7	a.	Illustrate the project management life cycle with a neat diagram.	10	L2	CO4
	b.	Explain : i) Different ways of categorizing software projects ii) Smart objectives	10	L2	CO4
OR					
Q.8	a.	Explain the difference between traditional versus modern project management practices along with the role of management.	10	L3	CO4
	b.	Explain software development life cycle (ISO 12207) with a neat diagram.	10	L2	CO4
Module – 5					
Q.9	a.	Explain Quality Management System with principles of BS EN ISO-9001-2000.	10	L2	CO5
	b.	Explain the following : i) McCall model ii) Garvin's Quality Dimensions.	10	L2	CO5
OR					
Q.10	a.	Describe six generic functions allowed in automated estimation techniques of software projects.	10	L3	CO5
	b.	Explain COCOMO II model.	10	L2	CO5

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BCS502

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

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.	What is data communication? List and explain characteristics and components of communication model.	06	L1	CO1	
	b.	Define switching. Explain Circuit Switched Network and Packet Switched Network.	06	L2	CO1	
	c.	With neat sketch, explain different layers of TCP/IP protocol suite.	08	L2	CO1	
OR						
Q.2	a.	What are guided transmission media? Explain twisted pair cable in detail.	06	L1	CO1	
	b.	What is Virtual Circuit Network (VCN)? With neat diagram, explain three phases involved in VCN.	08	L1	CO1	
	c.	Write a note on Encapsulation and decapsulation at Source Host for TCP/IP protocol suite.	06	L2	CO1	
Module – 2						
Q.3	a.	Define Redundancy. Explain CRC encoder and CRC decoder operation with block diagram.	08	L2	CO2	
	b.	Distinguish between Flow Control and Error Control. Explain Stop and Wait Protocol.	08	L2	CO2	
	c.	List and explain Control Fields of I-frames, S-frames and U-frames.	04	L2	CO2	
OR						
Q.4	a.	What is Hamming distance? With example, explain Parity Check Code.	06	L1	CO2	
	b.	Define Framing. Explain character oriented framing and bit-oriented framing.	06	L1	CO2	
	c.	With flow diagram, explain CSMA/CA.	08	L2	CO2	
Module – 3						
Q.5	a.	Explain virtual-circuit approach to route the packets in packet-switched network.	10	L2	CO3	
	b.	Illustrate the working of OSPF and BGP.	10	L3	CO3	
OR						
Q.6	a.	Explain IPv6 datagram format.	10	L2	CO3	
	b.	Write an Dijkstra's algorithm to compute shortest path through graph.	06	L1	CO3	
	c.	Write a note on Routing Information Protocol (RIP) algorithm.	04	L2	CO3	
Module – 4						
Q.7	a.	Explain Go-Back-N protocol working.	10	L2	CO4	
	b.	With neat sketch, explain three-way handshaking of TCP connection establishment.	10	L2	CO4	

OR

Q.8	a.	With an outline, explain selective repeat protocol.	10	L2	CO4
	b.	List and explain various services provided by User Datagram Protocol (UDP).	10	L2	CO4

Module – 5

Q.9	a.	Briefly explain Secure Shell (SSH).	10	L2	CO4
	b.	Write a note on Request message and response message formats of HTTP.	10	L2	CO4

OR

Q.10	a.	With neat diagram, explain the basic model of FTP.	04	L2	CO4
	b.	Describe the architecture of electronic mail (e-mail).	06	L3	CO4
	c.	Briefly explain Recursive Resolution and Iterative Resolution in DNS.	10	L2	CO4

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BCS503

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

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) Language ii) String iii) Power of an alphabet.	3	L1	CO1															
	b.	Define DFA. Draw a DFA to accepts. i) The set of all strings that contain a substring aba. ii) To accept the stings of a's and b's that contain not more than there b's. iii) $L = \{w \in \{a, b\}^* : \text{No 2 consecutive characters are same in } w\}$.	10	L3	CO1															
	c.	Convert the following NFA to DFA. <div style="text-align: center;"><table><tr><td></td><td>0</td><td>1</td></tr><tr><td>→ p</td><td>{p, q}</td><td>{p}</td></tr><tr><td>q</td><td>{r}</td><td>{r}</td></tr><tr><td>r</td><td>{s}</td><td>ϕ</td></tr><tr><td>* s</td><td>{s}</td><td>{s}</td></tr></table></div>		0	1	→ p	{p, q}	{p}	q	{r}	{r}	r	{s}	ϕ	* s	{s}	{s}	7	L2	CO1
	0	1																		
→ p	{p, q}	{p}																		
q	{r}	{r}																		
r	{s}	ϕ																		
* s	{s}	{s}																		
OR																				
Q.2	a.	Define the following with example : i) Alphabet ii) Reversal of string iii) Concatenation of Languages.	3	L1	CO1															
	b.	Design a DFA for the Language : $L = \{w \in \{0, 1\}^* : w \text{ is a string divisible by 5}\}$.	7	L3	CO1															
	c.	Define NFA. Obtain an ε - NFA which accepts strings consisting of 0 or more a's , followed by 0 or more b's followed by 0 or more C's. Also convert it to DFA.	10	L2	CO1															
Module – 2																				
Q.3	a.	Define Regular expression. Write the regular expression for the following languages : i) Strings of a's and b's starting with a and ending with b. ii) Set of strings that consists of alternating 0's and 1's. iii) $L = \{a^n b^m , (n + m) \text{ is even}\}$. iv) $L = \{w : w / \text{mod } 3 = 0 , \text{ where } w \in \{a, b\}^*\}$.	10	L2	CO2															

	b.	Minimize the following finite automata using Table filling algorithm : <div><table><tr><td>δ</td><td>a</td><td>b</td></tr><tr><td>\rightarrow A</td><td>B</td><td>A</td></tr><tr><td>B</td><td>A</td><td>C</td></tr><tr><td>C</td><td>D</td><td>B</td></tr><tr><td>*</td><td>D</td><td>A</td></tr><tr><td>E</td><td>D</td><td>F</td></tr><tr><td>F</td><td>G</td><td>E</td></tr><tr><td>G</td><td>F</td><td>G</td></tr><tr><td>H</td><td>G</td><td>D</td></tr></table></div>	δ	a	b	\rightarrow A	B	A	B	A	C	C	D	B	*	D	A	E	D	F	F	G	E	G	F	G	H	G	D	10	L2	CO2
δ	a	b																														
\rightarrow A	B	A																														
B	A	C																														
C	D	B																														
*	D	A																														
E	D	F																														
F	G	E																														
G	F	G																														
H	G	D																														
OR																																
Q.4	a.	Construct ε - NFA for the following Regular expression : i) $(0 + 1) 0 1(1 + 0)$ ii) $1(0 + 1)^* 0$ iii) $(0 + 1)^* 0 1 1^*$	6	L1	CO2																											
	b.	Obtain the Regular expression that denotes the language accepted by Fig. Q4(b). <div><p>Fig. Q4(b)</p><p>Using Kleene's theorem.</p></div>	6	L3	CO2																											
	c.	State the Pumping Lemma for the Regular Languages. And also prove that the following languages are not regular. i) $L = \{0^n 1^m \mid n \leq m\}$ ii) $L = \{0^n 1^m 2^n \mid n, m \geq 1\}$.	8	L1	CO2																											
Module - 3																																
Q.5	a.	Design CFG for the following languages : i) $L = \{a^n b^{n+3}, n \geq 0\}$ ii) $L = \{a^i b^j c^k, j = i + k, i \geq 0, k \geq 0\}$ iii) $L = \{w \mid w \bmod 3 > 0 \text{ where } w \in \{a\}^*\}$ iv) $L = \{a^m b^n \mid m \neq n\}$ v) Palindromes over 0 and 1.	10	L3	CO3																											
	b.	Consider the grammar G with productions. $S \rightarrow A b B / A / B$; $A \rightarrow aA / \varepsilon$; $B \rightarrow aB / bB / \varepsilon$. Obtain LMD , RMD and parse tree for the string aaabab. Is the given grammar ambiguous?	10	L2	CO3																											
OR																																
Q.6	a.	Define the following with example : i) Context free grammar ii) Left most Derivation iii) Parse tree iv) Ambiguous grammar.	4	L1	CO3																											
	b.	Design PDA for the language : $L = \{a^i b^j c^k \mid i + k = j, i \geq 0, k \geq 0\}$ and show the moves made by the PDA for the string aabbbc.	10	L3	CO3																											

	c.	Convert the following CFG's to PDA : $S \rightarrow aA$; $A \rightarrow aABC / bB / a$; $B \rightarrow b$; $C \rightarrow c$.	6	L2	CO3
Module – 4					
Q.7	a.	Define CNF. Convert the following CFG to CNF $E \rightarrow E + T / T$ $T \rightarrow T * F / F$ $F \rightarrow (E) / I$ $I \rightarrow Ia / Ib / a / b$.	10	L2	CO4
	b.	Show that $L = \{0^n 1^n 2^n / n \geq 1\}$ is not context free.	4	L2	CO4
	c.	Prove that the family of context free languages is closed under union and concatenation.	6	L1	CO4
OR					
Q.8	a.	Define Greibach Normal Form. Convert the following CFG to GNF. $S \rightarrow AB$; $A \rightarrow aA / bB / b$; $B \rightarrow b$.	6	L2	CO4
	b.	Consider the following CFG : $S \rightarrow ABC / BaB$ $A \rightarrow aA / BaC / aaa$ $B \rightarrow bBb / a / D$ $C \rightarrow CA / AC$ $D \rightarrow \epsilon$ i) What are useless symbols? ii) Eliminate ϵ - productions , Unit productions and useless symbols from the grammar.	10	L3	CO4
	c.	Prove that the following languages are not context free. i) $L = \{a^i / i \text{ is prime}\}$ ii) $L = \{a^{n^2} / n \geq 1\}$.	4	L2	CO3
Module – 5					
Q.9	a.	Define a turing machine and explain with neat diagram, the working of a basic turing machine.	6	L1	CO4
	b.	Design a Turing machine to accept the language, $L = \{a^n b^n c^n / n \geq 1\}$. Draw the transition diagram and show the moves for the string aabbcc.	14	L4	CO4
OR					
Q.10	a.	Design a Turing machine to accept palindrome over $\{a, b\}$ and draw the transition diagram.	12	L4	CO5
	b.	Write a short notes on : i) Recursively Enumerable Language. ii) Multitape Turing Machine.	8	L1	CO5

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Question Paper Version : D

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.

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1. 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
 2. 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
 3. 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
 4. Which of the integrated waste management is reduced on an individual level?
a) Source Reduction b) Recycling c) Disposal d) Burning
 5. 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
 6. The process of decomposition of biodegradable solid waste by earthworms is called
a) Landfill b) Vermicomposting c) Composting d) Shredding
 7. _____ is a liquid that passes through solid waste and extracts suspended impurities from it
a) Leachate b) Sludge c) Distilled water d) Municipal
 8. The colour code of plastic bag for disposing of microbial laboratory culture waste
a) black b) red c) blue d) white
 9. 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

10. 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
11. 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
12. 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
13. 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
14. 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
15. Which kind of soil we can find on the surface of Thar desert?
 - a) Rocky b) Moist c) Fertile d) Aeolian
16. 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
17. Hot spots areas have
 - a) Low density of biodiversity b) Only endangered plants
 - c) High density of hot springs d) High density of biodiversity
18. 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
19. 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
20. Algae , green plants and photosynthetic bacteria are
 - a) Autotrophic b) Heterotrophic c) Decomposers d) Consumers

21. What is Extended Producer Responsibility (EPR) as per the e – waste management rules in India?
- The responsibility of consumer to manage e – waste
 - The responsibility of manufactures to manage e – waste throughout the product life cycle
 - The responsibility of retailers to manage e – waste disposal
 - The responsibility of informal recyclers to manage e – waste.
22. Which international agreement regulates the transboundary movements of hazardous waste, including e – waste?
- Kyoto Protocol
 - Paris agreement
 - Montreal Protocol
 - Basel convention
23. Which colour bin is used for e – waste?
- Blue
 - Green
 - Yellow
 - Black
24. What are the health hazards which can be caused by E – waste?
- Lung cancer
 - DNA damage
 - Brain
 - All of these
25. Preparation of Guidelines for Environmentally sound Management of e – waste is a duty assigned to
- Producer
 - Consumer
 - MOEFCC
 - SP CB/PCC
26. What is India's global rank in e – waste?
- 3
 - 13
 - 23
 - 33
27. When did the Karnataka State Pollution Control Board for prevention and control of water pollution constituted?
- 1974
 - 1978
 - 1982
 - 1986
28. Aerosol consisting of liquid droplets is called as
- Mist
 - Dust
 - Fog
 - Aerosol
29. Which of the following is non – point source of water pollution?
- Factories
 - Sewage treatment plant
 - Urban and suburban land
 - All of these
30. When is World Water day celebrated?
- January 26th
 - June 5th
 - September 22nd
 - March 22nd
31. _____ is caused by drinking water high in nitrates.
- Cholera
 - Kidney problem
 - Liver problem
 - Methomoglobinemia
32. Bhopal gas tragedy took place in the year _____ and the gas responsible was _____
- 1964, Hydrogen fluoride
 - 1974, Methyl chloride
 - 1984, methyl ISO – cyanide
 - 1994, Methyl sulphate
33. The major chemical pollutants in photochemical smog are
- NO, NO₂, VOC, O₃, PAN
 - N₂O, NO₂, VOC, O₃, PAN
 - NO, NO₂, VOC, O₂, PAN
 - NO, N₂O₅, VOC, O₃, PAN

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48. 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
49. 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
50. 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

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

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.	Define the following : i) Intelligence ii) Artificial Intelligence iii) Agent iv) Rationality v) Logical reasoning.	5	L2	CO1
	b.	Examine the AI literature to discover whether the following tasks can currently be solved by computers. i) Playing a decent game of table tennis (ping-pong) ii) Discovering and proving new mathematical theorems iii) Giving competent legal advice in a specialized area of law iv) Performing a complex a surgical operation.	8	L2	CO1
	c.	Implement a simple reflex agent for the vacuum environment. Run the environment with this agent for all possible initial dirt configurations and agent locations. Record the performance score for each configuration and the overall score.	7	L3	CO1
OR					
Q.2	a.	Is AI a science, or is it engineering or neither or both? Explain.	5	L2	CO1
	b.	Write pseudocode agent programs for the goal based and utility based agents.	8	L1	CO1
	c.	For each the following activities give a PEAS description. i) Playing a tennis match ii) Performing a high jump iii) Bidding on an item in an auction.	7	L1	CO1
Module – 2					
Q.3	a.	Explain why problem formulation must follow goal transformation.	5	L1	CO1
	b.	Give complete problem formulation for each of the following choose a formulation that is precise enough to be implemented. i) Using only four colors, you have to color a planar graph in such a way that no two adjacent regions have the same color. ii) A 3 – foot – tall monkey is in a room where some bananas are suspended from the 8-foot ceiling. He would like to get the bananas. The room contains two stackable, moveable, climbable 3-foot high crates.	8	L2	CO2
	c.	Prove each of the following statements or given counter example : i) Breadth – first search is a special case of uniform – cost search. ii) Uniform – cost search is a special case of A* search.	7	L2	CO2

OR					
Q.4	a.	Define the following terms with example. i) State space ii) Search node iii) Transition model iv) Branching factor.	8	L2	CO2
	b.	Show that the 8-puzzle states are divided in to two disjoint sets, such that any state is reachable from any other state in the same set, while no state is reachable from any state in the other set. Devise a procedure to decide which set a given state is in and explain why this is useful for generating random state.	7	L2	CO2
	c.	Describe a state space in which iterative deepening search performs much worse than depth first search for example, $O(n^2)$ Vs $O(n)$.	5	L2	CO2
Module – 3					
Q.5	a.	Devise a state space in which A^* using GRAPH-SEARCH returns a suboptimal solution with $h(n)$ function that is admissible but inconsistent.	7	L2	CO3
	b.	Which of the following are correct? i) $(A \vee B) \wedge (\neg C \vee \neg D \vee E) \vee (A \vee B)$ ii) $(A \vee B) \wedge (\neg C \vee \neg D \vee E) \vee (A \vee B) \wedge (\neg D \vee E)$ iii) $(A \vee B) \wedge \neg(A \Rightarrow B)$ is satisfiable iv) $(A \Leftrightarrow B) \Leftrightarrow C$ has the same number of models as $(A \Leftrightarrow B)$	8	L1	CO3
	c.	Consider a vocabulary with only four propositions, A, B, C and D. How many models are there for the following sentences? i) $B \vee C$ ii) $\neg A \vee \neg B \vee \neg C \vee \neg D$ iii) $(A \Rightarrow B) \wedge A \wedge \neg B \wedge C \wedge D$.	5	L1	CO3
OR					
Q.6	a.	Prove that if a heuristic is consistent, it must be admissible. Construct an admissible heuristic that is not consistent.	8	L1	CO3
	b.	Prove each of the following assertions : i) $\alpha \equiv \beta$ if and only if the sentence $(\alpha \Leftrightarrow \beta)$ is valid ii) $\alpha \neq \beta$ if and only if the sentence $\alpha \wedge \neg \beta$ is unsatisfiable.	7	L1	CO3
	c.	Prove, or find a counter example to each of the following assertions. i) If $\alpha \neq (\beta \wedge \gamma)$ then $\alpha \neq \beta$ and $\alpha \neq \gamma$ ii) If $\alpha \neq (\beta \vee \gamma)$ then $\alpha \neq \beta$ and $\alpha \neq \gamma$ (or) both	5	L1	CO3
Module – 4					
Q.7	a.	Which of the following are valid necessary true sentences? i) $(\exists x x = x) \Rightarrow (\forall y \exists z y = z)$ ii) $\forall x P(x) \vee \neg p(x)$ iii) $\forall x \text{ smart}(x) \vee (x = x)$	7	L1	CO4
	b.	Prove that universal Instantiation is sound that existential instantiation produces an inferentially equivalent knowledge base.	5	L1	CO4

	c.	Write down logical representations for the following sentences, suitable for use with generalized modulus ponens : i) Horses, cows and pigs are mammals ii) Bluebeard is Charlie's parent iii) Offspring and parent are inverse relations	8	L1	CO4
OR					
Q.8	a.	Consider a knowledge base containing just two sentence ; P(a) and P(b) does this knowledge base entail $\forall x P(x)$? Explain your answer interms of models.	5	L2	CO4
	b.	Suppose a knowledge base contains just one sentence, $\exists x \text{AsHighAs}(x, \text{Everest})$ which of the following are legitimate results of applying existential instantiation? i) $\text{AsHighAs}(\text{Kilimanjaro}, \text{Everest})$ ii) $\text{AsHighAs}(\text{Kilimanjaro}, \text{Everest}) \wedge \text{AsHighAs}(\text{Benvevis}, \text{Everest})$	8	L2	CO4
	c.	Explain how to write any 3-SAT problem of arbitrary size using a single first order definite clause and no more than 30 ground facts.	7	L2	CO4
Module – 5					
Q.9	a.	i) Give a backward chaining proof of the sentence $7 \leq 3 + 9$. Show only the steps that leads to success ii) Give a forward chaining proof of the sentence $7 \leq 3 + 9$. Show only the steps that leads to success.	8	L1	CO5
	b.	Describe the differences and similarities between problem solving and planning.	5	L2	CO5
	c.	Prove that backward search with PDDL problems is complete.	7	L1	CO5
OR					
Q.10	a.	The following prolog code defines a predicate P $P(x, [x y])$, $P(x, [y z]) :- P(x, z)$ i) Show proof trees and solutions for the queries $P(A, [2, 1, 3])$ and $P(z, [1, A, 3])$ ii) What standard list operation does P represent?	8	L1	CO5
	b.	Explain why dropping negative effects from every action schema in a planning problem results in a relaxed problems.	5	L2	CO5
	c.	Prove the following assertions about planning graphs : i) A literal that does not appear in the final level of the graph cannot be achieved. ii) The level cost of a literal in a serial graph is no greater than the actual cost of an optimal plan for achieving it.	7	L1	CO5

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BCG515D

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

Designing Human Centred System

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 the factors that biases our perception and explain briefly.	4	L1	CO1
	b.	Illustrate the gestalt principle of figure/ground with a neat diagram	6	L2	CO1
	c.	Organize perception biased by goals and experience.	10	L3	CO1
OR					
2	a.	What is gestalt principles?	4	L1	CO1
	b.	Make use of various gestalt principles in designing the interface.	10	L2	CO1
	c.	Illustrate the perception biased by context.	6	L3	CO1
Module – 2					
3	a.	What are the design implications for readings?	4	L1	CO2
	b.	Explain the much of reading required by software is unnecessary.	6	L2	CO2
	c.	Determine the guidelines for using color with examples.	10	L3	CO2
OR					
4	a.	How color blinded people recognize the colors.	4	L1	CO2
	b.	Identify the ability to distinguish colors.	6	L2	CO2
	c.	Choose the different ways of readings and explain with example.	10	L3	CO2
Module – 3					
5	a.	What is information “Scent” towards our goal?	4	L1	CO3
	b.	Illustrate the concept of recognition is easy and recall is hard with examples.	6	L2	CO3
	c.	Organic the implications for UI using recognition or recall and explain with examples.	10	L3	CO3
OR					
6	a.	List the external aids to keep track of achieving goal.	4	L1	CO3
	b.	Explain the implication of short-term memory characteristics for user interface design.	6	L2	CO3
	c.	Organize and explain our thought cycle.	10	L3	CO3
Module – 4					
7	a.	How does the new brain act as brake on impulsive behavior.	4	L1	CO4
	b.	Explain the implication of Fitt's law in UI design.	6	L2	CO4
	c.	Utilize the steering law and explain with example.	10	L3	CO4
OR					
8	a.	What are the factors used to learn faster?	4	L1	CO4
	b.	Explain object action matrix.	6	L1	CO4
	c.	Illustrate the steps involved in design of software, service or application.	10	L3	CO4
1 of 2					

Module – 5

9	a.	List and explain guidelines for achieving responsive interactive system.	4	L1	CO5
	b.	Explain the time deadline for human computer interactions.	6	L2	CO5
	c.	i) Examine and explain the following : ii) Saccade (involuntary eye movement) iii) Flinch reflex (involuntary motor response to possible danger) iv) Subliminal perception v) Perceptual locking of events and sound.	10	L3	CO5
OR					
10	a.	What is fake heavy weight computation?	4	L1	CO5
	b.	Explain the design steps to avoid slips.	6	L2	CO5
	c.	Explain relationship of mistakes and slips using examples.	10	L4	CO5

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
