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 Dijikstra'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) $L = \{w \in \{a, b\}^* :$ No 2 consecutive characters are same in w$\}$.	10	L3	CO1
	c.	Convert the following NFA to DFA.	7	L2	CO1

	0	1
→ p	{p, q}	{p}
q	{r}	{r}
r	{s}	ϕ
* s	{s}	{s}

OR

			M	L	C
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 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) $L = \{a^n bm , (n + m)$ is even$\}$. iv) $L = \{w : / w / \bmod 3 = 0$, where $w \in \{a, b\}^*\}$.	10	L2	CO2

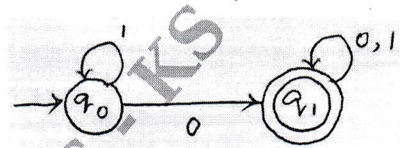
	b.	Minimize the following finite automata using Table filling algorithm :	10	L2	CO2

	δ	a	b
→	A	B	A
	B	A	C
	C	D	B
*	D	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).	6	L3	CO2

Fig. Q4(b)



Using Kleene's theorem.

	c.	State the Pumping Lemma for the Regular Languages. And also prove that the following languages are note regular. i) $L = \{0^n 1^m \mid n \le m\}$ ii) $L = \{0^n 1^m 2^n \mid n, m \ge 1\}$.	8	L1	CO2

Module – 3

Q.5	**a.**	Design CFG for the following languages : i) $L = \{a^n b^{n+3}, n \ge 0\}$ ii) $L = \{a^i b^j c^k, j = i + k, i \ge 0, k \ge 0\}$ iii) $L = \{w / \|w\| \bmod 3 > 0 \text{ where } w \in \{a\}^*\}$ iv) $L = \{a^m b^n / m \ne n\}$ v) Palinderomes over 0 and 1.	10	L3	CO3
	b.	Consider the grammar G with productions. S → A b B / A / B ; A → aA / ε ; B → a B / b B / ε. 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 : $L = \{a^i b^j c^k / i + k = j, i \ge 0, k \ge 0\}$ 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 $L = \{0^n 1^n 2n / n \geq 1\}$ is no 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 : $S \rightarrow ABC / BaB$ $A \rightarrow aA / BaC / aaa$ $B \rightarrow bBb / a / D$ $C \rightarrow CA / AC$ $D \rightarrow \varepsilon$ 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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CBCS SCHEME

BCS508

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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?
    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.

22. 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

23. Which colour bin is used for e – waste?
    a) Blue
    b) Green
    c) Yellow
    d) Black

24. What are the health hazards which can be caused by E – waste?
    a) Lung cancer
    b) DNA damage
    c) Brain
    d) All of these

25. 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

26. What is India's global rank in e –waste?
    a) 3
    b) 13
    c) 23
    d) 33

27. When did the Karnataka State Pollution Control Board for prevention and control of water pollution constituted?
    a) 1974
    b) 1978
    c) 1982
    d) 1986

28. Aerosol consisting of liquid droplets is called as
    a) Mist
    b) Dust
    c) Fog
    d) Aerosol

29. 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

30. When is World Water day celebrated?
    a) January 26th
    b) June 5th
    c) September 22nd
    d) March 22nd

31. _____ is caused by drinking water high in nitrates.
    a) Cholera
    b) Kidney problem
    c) Liver problem
    d) Methomoglobinemia

32. 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

33. The major chemical pollutants in photochemical smog are
    a) NO, NO_2 , VOC , O_3 , PAN
    b) N_2O , NO_2 , VOC, O_3 , PAN
    c) NO, NO_2 , VOC , O_2 , PAN
    d) NO, N_2O_5, VOC, O_3 , PAN

34. The international protocol to protect the Ozone layer is
a) Vienna protocol b) Kyoto protocol
c) Cartagena protocol d) Montreal protocol

35. 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

36. What is called for a Temporary hearing loss?
a) Temporary ear pain b) Temporary hearing problem
c) Temporary threshold shift d) Temporary hearing shift

37. 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

38. 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

39. 'Minamata Disease" is caused due to
a) Lead b) Arsenic c) Mercury d) Cadmium

40. The process of reducing the fluoride content from water is called as
a) Chlorination b) Fluoridation
c) Defluoridation d) Fanning and Lofting

41. Veld type grasslands are located at
a) South Africa b) South America c) Australia d) Britain

42. Which pyramid is always upright?
a) Energy b) Biomass c) Numbers d) Food chain

43. In what form is solar energy is radiated from the Sun?
a) Ultraviolet Radiation b) Infrared Radiation
c) Electromagnetic waves d) Transverse waves

44. 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

45. The 'Miracle Material' that can turn CO_2 into liquid fuel is :
a) Propane b) Copper c) Graphene d) Potassium

46. A tide whose difference between high and low tide is greatest.
a) Diurnal tide b) Neap tide c) Spring tide d) Ebb tide

47. Which of the turbine can be mounted vertically and horizontally.
a) Pelton wheel b) Kaplan turbine c) Gorlov turbine d) Francis turbine

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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CBCS SCHEME

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BCS515B

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) $(A \vee B) \wedge (\neg C \vee \neg D \vee E) F (A \vee B)$ ii) $(A \vee B) \wedge (\neg C \vee \neg D \vee E) F (A \vee B) \wedge (\neg D \vee E)$ iii) $(A \vee B) \wedge \neg (A \Rightarrow B)$ is satistiable 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) $\forall x$ smart$(x) \vee (x = x)$	**7**	**L1**	**CO4**
	b.	Prove that universal Instantiation is sound that existential instanticition 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, $\exists x\, As\, High\, As(x, Everest)$ which of the following are legitimate results of applying existential instantiation? i) AsHighAs(Kilimanjaro, Everest) ii) AsHighAs(Kilimanjaro, Everest) $\wedge$ AsHighAs (Benvevis, 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 connot 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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CBCS SCHEME

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BCS515C

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

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 Kernel and Shell relationship in UNIX operating system with a neat diagram.	10	L1	CO1
	b.	Explain the following UNIX commands with syntax and examples: i) who ii) ls iii) passwd iv) echo v) date	10	L2	CO1
		OR			
Q.2	a.	Explain any five file related commands with syntax and example of each.	10	L2	CO1
	b.	Explain the salient features of UNIX operating system.	04	L1	CO1
	c.	Explain the file types or categories.	06	L2	CO1
		Module – 2			
Q.3	a.	Explain the use of chmod command to change file permission using both absolute and relative methods.	10	L2	CO2
	b.	Explain ls commands with all the options and examples.	10	L2	CO2
		OR			
Q.4	a.	Explain grep commands with all its options.	10	L2	CO2
	b.	Explain three standard files in UNIX.	06	L2	CO2
	c.	Explain the steps of shell interpretive cycle.	04	L2	CO2
		Module – 3			
Q.5	a.	Explain POSIX and SUS (Single UNIX Specification) standards.	04	L2	CO3
	b.	Develop a C program to demonstrate the use of open( ) and read( ) system call in UNIX.	10	L3	CO3
	c.	Explain the use of mkdir( ) and rmdir( ) function in managing directories.	06	L2	CO3
		OR			
Q.6	a.	Differentiate between character special files and block special files.	06	L2	CO3
	b.	Develop a c program to demonstrate the chdir( ) and fchdir( ) functions in UNIX.	10	L3	CO3
	c.	Explain the memory layout of a C program in UNIX.	04	L2	CO3
		Module – 4			
Q.7	a.	Develop both the fork and vfork function in a example program.	10	L3	CO4
	b.	Explain briefly with an example two system v IPC mechanism: i) Message Queues ii) Semaphores	10	L2	CO4
		OR			
Q.8	a.	Explain pipes and its limitations upon developing a program to send data from parent to child over a pipe.	10	L2	CO4
	b.	Explain the client server communication using FIFO with a neat diagram.	10	L2	CO4
		Module – 5			
Q.9	a.	Illustrate signal in UNIX and develop program to setup signal handlers for sigsetsmp( ) and ·abort( ).	10	L3	CO5
	b.	Explain Daemon process by developing program to transform a normal user into a Daemon process.	10	L3	CO5
		OR			
Q.10	a.	Explain implement SIGPROCMASK and SIGCONGJMP functions with examples.	10	L2	CO5
	b.	Explain coding rules and error logging for Daemon process with neat	10	L2	CO5

CBCS SCHEME

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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.	Indentify 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**

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