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| [Time:2.30 Hrs]   |   | [ Marks:75 ] |
| Please check whether you have got the right question paper. |   |              |
| N.B:  | 1. All question are compulsory.<br>2. Figures to the right indicate full marks.<br>3. Students answering in the regional language should refer in case of doubt to the main text of the paper in English. |              |

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| Q.1 | Attempt <b>any four</b> of the following.<br><br>A. Explain transition and its properties.<br>B. Explain DFA through example.<br>C. Explain Chomsky classification of grammar and languages.<br>D. Explain Acceptability by finite automaton using example.<br>E. Write a short note on mealy machine with example.<br>F. What are the operations on Languages? | 20 |
| Q.2 | Attempt <b>any four</b> of the following.<br><br>A. Explain regular sets and regular grammar.<br>B. Write a short note on regular expression.<br>C. Explain pumping lemma and its applications.<br>D. Write a short note on derivation tree.<br>E. Define PDA. Explain its acceptance.<br>F. Describe all the closure properties.                               | 20 |
| Q.3 | Attempt <b>any four</b> of the following.<br><br>A. Explain universal Turing machine.<br>B. Explain various variants of Turing machine.<br>C. Write a short note on halting problem.<br>D. Explain representations of Turing machine.<br>E. How language will be prepared using linear bound automata.<br>F. What is linear bound automata model?               | 20 |
| Q.4 | Attempt <b>any three</b> of the following.<br><br>A. Write a short note on ambiguity of grammar.  | 15 |

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|  |  | <p>B. Write a short note on Moore machine.</p> <p>C. Explain context-free language.</p> <p>D. What is Turing machine construction?</p> <p>E. Explain NDFA using example.</p> <p>F. Write a short note on church-Turing thesis.</p> |  |
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