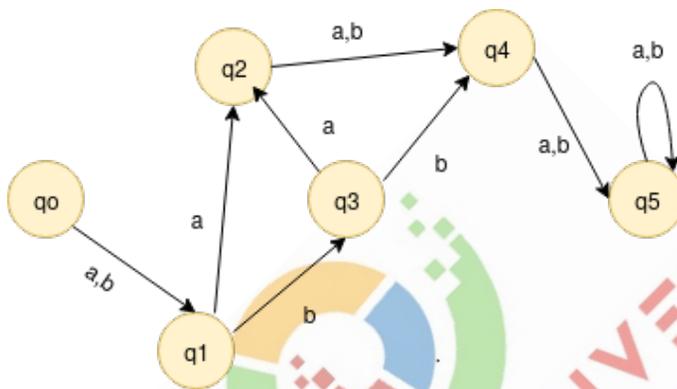


SECTION-B

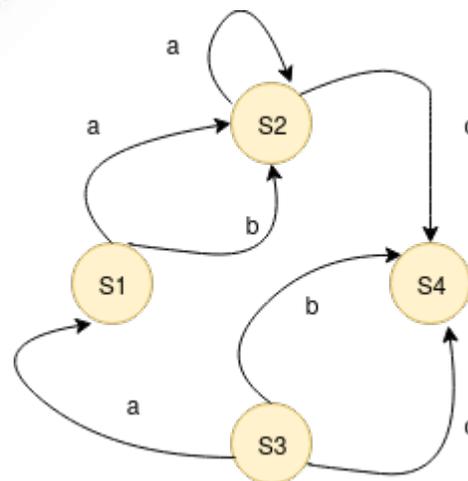
- Q. No. 6.** John rides a Van service from new square (S) to the city harbor (T). The van service charges Rs 10 per Km. There are numerous routes between the two points.
- (a) In order to rip off his customers, John always wanted to use the longest path. To find the longest path, John evaluates all the possible paths and selects the longest path. Write an algorithm to select the longest path using this approach. (7)
 - (b) Compute the complexity of this algorithm and determine that whether it is in P, NP, or NP-complete. (3)
 - (c) Write an algorithm to find a minimum distance between 'S' and 'T'. (7)
 - (d) Derive the complexity of this algorithm. (3)

- Q. No. 7.**
- (a) How many tokens are there in in this C code : (5)
`printf("k = %d, &k = %x", k, &k);`
 - (b) Create State Transition Table from the following graph (5)



- (c) Draw Finite State Automata which accepts following input. (4)
 - i. JIM
 - ii. JMI
 - iii. JJIIM
 - iv. JJMMII
- (d) Determine which of these inputs are valid for the FSM shown below: (6)

- i. aaaaa
- ii. ababa
- iii. abcabc
- iv. abccba
- v. acbcd
- vi. acbedcd



- Q. No. 8.**
- (a) Is $P = NP$? Comment (4)
 - (b) Suppose you are representing a social network (such as facebook) as a graph. Devise an algorithm through which you can determine friends of friends. (7)
 - (c) Explain the complexity of this algorithm (5)
 - (d) Optimal problems are generally NP hard problems. Is it appropriate to use heuristics based approaches? (4)
