SUBJECT CODE NO:- P-8039
FACULTY OF ENGINEERING AND TECHNOLOGY
M.E. (Comp.Sci.& Engg.) Examination May/June 2017
Advanced Algorithm
(Revised)

[Time : Three Hours]   **[Max Marks :80]**

N.B   1) Attempt any two questions from each section
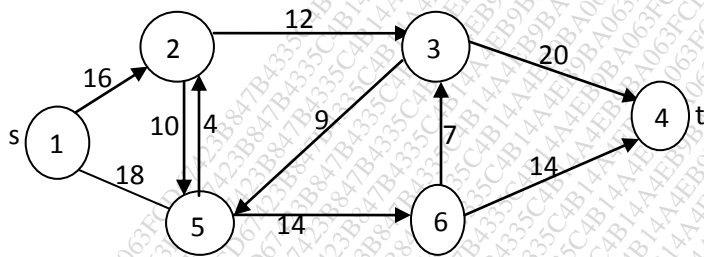   Section A

Q.1   a)   What is a greedy algorithm? Solve the following activity selection problem.   15

i	1	2	3	4	5	6	7	8	9	10	11
S_i	1	3	0	5	3	5	6	8	8	2	12
f_i	4	5	6	7	8	9	10	11	12	12	14

         b)   Explain dynamic programming with suitable example.   05

Q.2   a)   What is hiring problem? How to solve it using probabilistic analysis.   10
         b)   Explain maximum flow problem for the following graph.   10

Q.3   a)   Sort the given data using heap sort & comment on complexity   10
              80 20 30 60 90 50 100 40 40
         b)   How to measure performance of an algorithm? Prove comparison sort methods have complexity   10
              O (n log n)

                                        Section B

Q.4   a)   Find the position tree for abababa $ 07
         b)   Explain iterative FFT.   07
         c)   Explain extended Euclid's algorithm   06

Q.5   a)   Draw a Hamiltonian circuit for the following Boolean expression   12
              $$(x1 + \overline{x}2 + x3)(x1 + x2 + x3)(\overline{x}1 + x2 + \bar{x}3)$$
         b)   Prove that vertex cover problem is NP-Complete.   08

Q.6   a)   Draw a state transition diagram of finite automata for the following regular expression over the 12
              alphabet
              $f = \{a, b, c\}$
              1) $bc^* (abc + b)a^*$
              2) $(a + bc^*)ab (bb + cc)$
         b)Prove that 3 – SAT is NP – complete   08

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