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Reg. No.:	16				80	40

Question Paper Code: 40918

B.E./B.Tech. DEGREE EXAMINATION, APRIL/MAY 2018
Seventh/Eighth Semester
Computer Science and Engineering
CS 6702 – GRAPH THEORY AND APPLICATIONS

(Common to : Information Technology)
(Regulations 2013)

Time: Three Hours Maximum: 100 Marks

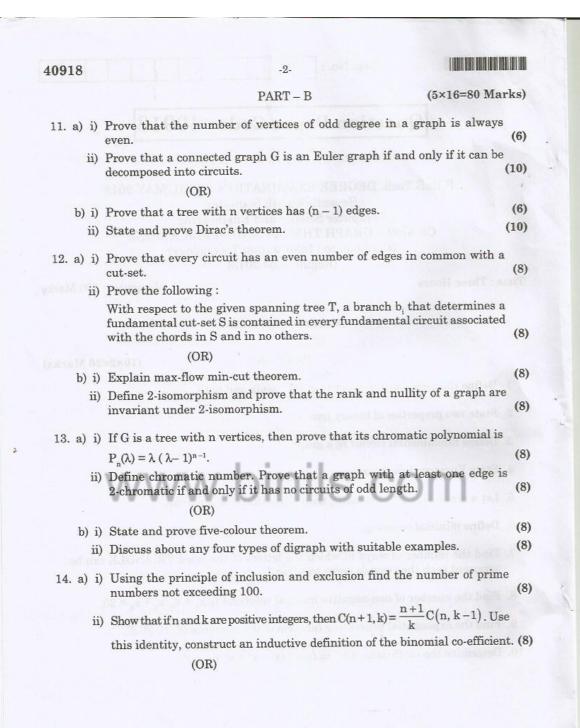
Answer ALL questions

PART - A

(10×2=20 Marks)

1. Define the terms with respect to graph: walk and path.

- 2. State two properties of binary tree.
- 3. Define fundamental circuit in a graph.
- 4. State Kuratowski's theorem.
- 5. Let a graph G is 2- chromatic, then prove that it is bipartite.
- 6. Define minimal covering.
- 7. Find the number of ways in which the letters of the word TRIANGLE can be arranged such that vowels occur together?
- 8. Find the number of non-negative integral solutions to  $x_1 + x_2 + x_3 + x_4 = 20$ .
- 9. Find the exponential generating function of the sequence 0!, 1!, 2!, 3!, ...
- 10. Determine the coefficient of  $x^{15}$  in  $f(x) = (x^2 + x^3 + x^4 + \dots)^4$ .



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b) i)	A survey of 150 college students reveals that 83 own cars, 97 own bikes, 28 own motorcycles, 53 own a car and a bike, 14 own a car and motorcycle, 7 own a bike and a motorcycle and 2 own all the three. How many students own a bike and nothing else and how many students do not own any of the three?	(8)
ii)	Five professors $P_1$ , $P_2$ , $P_3$ , $P_4$ , $P_5$ are to be made class advisor for five sections $C_1$ , $C_2$ , $C_3$ , $C_4$ , $C_5$ , one professor for each section. $P_1$ and $P_2$ do not wish to become the class advisors for $C_1$ or $C_2$ , $P_3$ and $P_4$ for $C_4$ or $C_5$ and $P_5$ for $C_3$ or $C_4$ or $C_5$ . In how many ways can the professors be assigned the work (without displacing any professor)?	(8)
15. a) i)	Obtain the fractional de-composition and identify the sequence having the expression $\frac{3-5z}{1-2z-3z^2}$ as a generating function.	(8)
ii)	Find the generating function of the sequence 7, 8, 9, 10,	(4)
	Find the number of distinct summands of the integer 6.  (OR)	(4)
b) i)	Solve the recurrence relation $y_{n+2} - 6y_{n+1} + 8y_n = 3n+5$ .	(8)
	If $a_n$ denotes the sum of the first n positive integers, find a recurrence relation for $a_n$ and then solve it.	(8)

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