(2 Hours 30 min) **(Total Marks:75)**

N.B:

1. **AII questions are compulsory.**
2. **Figures to the right indicate marks.**
3. **Illustration, in-depth answers and diagrams will be appreciated.**
4. **Mixing of sub-questions is not allowed. Each question carries 5 marks.**

1		**Attempt any Three**	**15**
	a	Explain Dijkstra's algorithm	
	b	Explain Social networks vs. link analysis	
	c	Explain Ego-centric and socio-centric density.	
	d	Briefly Explain Adjacency matrices	
	e	What is Edge-lists?	
	f	Explain Social Network Analysis?	
2		**Attempt any Three**	**15**
	a	How do you calculate Centralization and graph centers?	
	b	Discuss the bottom-up network structures in detail.	
	c	Explain the cutpoints with its advantages and disadvantages.	
	d	Explain about K-plexes and K-cores.	
	e	How do N-cliques and N-clans "relax" the definition of a clique?	
	f	Write the Google PageRAnk Algorithm ?	
3		**Attempt any Three**	**15**
	a	If the adjacency matrix for a network can be blocked into perfect sets of structurally equivalent actors, all blocks will be filled with zeros or with ones. Why is this?	
	b	If two actors have identical geodesic distances to all other actors, they are (probably) automorphically equivalent. Why does having identical distances to all other actors make actors "substitutable" but not necessarily structurally equivalent?	
	c	How are network roles and social roles different from network "substructures" as ways of describing social networks?	
	d	Explain the differences among structural, automorphic, and regular equivalence.	
	e	Actors who are structurally equivalent have the same patterns of ties to the same other actors. How do correlation, distance, and match measures index this kind of equivalence or similarity?	
	f	Regularly equivalent actors have the same pattern of ties to the same kinds of other actors -but not necessarily the same distances to all other actors, or ties to the same other actors. Why is this kind of equivalence particularly important in sociological analysis?	

4		**Attempt any Three**	**15**
	a	Illustrate how the results of correspondence analysis can be interpreted	
	b	Describe the quantitative analysis in social network using suitable example.	
	c	Compare SVD with two-mode factor analysis	
	d	What are the two alternative methods used in bipartite network?	
	e	State the purpose of visualising data	
	f	What is two-mode network? Explain with example	
5		**Attempt any Three**	**15**
	a	How the bipartite network is managed? Give example.	
	b	Write short note on quality analysis.	
	c	Explain Brute Force and Tabu Search	
	d	How does the idea of a "block" relax the strict definition of a component?	
	e	Compare Connectivity with reciprocity	
	f	Write a short on Graph traversals and distances	

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