Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 70015

M.E. / M.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2025
Third Semester
VLSI Design
P23VDE20 – WIRELESS ADHOC AND SENSOR NETWORKS
(Regulation 2023)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Mention the challenges in auto-configuration of nodes in ad-hoc networks.	2	K1	CO1
2.	Compare and contrast IEEE 802.3 and IEEE 802.11 standards in terms of medium access.	2	K2	CO1
3.	Classify routing protocols based on route discovery technique.	2	K2	CO2
4.	Relate classification of routing protocols with network topology changes.	2	K1	CO2
5.	Define multicast routing in the context of Ad Hoc wireless sensor networks.	2	K1	CO3
6.	Outline the role of multicast core in distributed multicast routing.	2	K2	CO3
7.	List key objectives of topology control in wireless sensor networks.	2	K1	CO4
8.	Relate localization techniques to accuracy in event detection.	2	K1	CO4
9.	Recall passive and active security attacks in Ad Hoc networks.	2	K1	CO5
10.	Classify key management approaches for wireless networks.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	With a neat diagram, explain the TCP protocol operation in conventional wired networks. How does TCP behave differently in MANETs, and what are the proposed solutions?	13	K2	CO1
		(OR)			
	b)	Explain the role of self-configuration and auto-configuration in establishing a fully operational Ad Hoc network with minimal human intervention.	13	K2	CO1
12.	a)	Analyze table-driven, on-demand, and hybrid routing strategies and compare their trade-offs in terms of overhead, delay, and reliability.	13	K4	CO2
		(OR)			
	b)	Analyze the impact of efficient flooding mechanisms on routing overhead and network lifetime with suitable illustrations.	13	K4	CO2
13.	a)	Examine the operational steps of a multicast routing protocol and relate them to performance in dynamic topologies.	13	K2	CO3
		(OR)			
	b)	Explain classification of multicast routing protocols (tree-based, mesh-based, zone-based) with examples and compare their overhead.	13	K2	CO3
14.	a)	Summarize various topology control protocols, comparing their ability to minimize interference, maintain connectivity, and balance energy consumption.	13	K4	CO4
		(OR)			
	b)	Analyze localization and positioning approaches (range-based vs range-free) and relate them to node deployment density and cost efficiency.	13	K4	CO4
15.	a)	Interpret the issues and challenges in security provisioning considering mobility, lack of infrastructure, and energy constraints.	13	K2	CO5
		(OR)			
	b)	Discuss the key management schemes such as threshold cryptography and identity-based cryptography with respect to scalability and resilience.	13	K2	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	In a large-scale smart agriculture deployment, hundreds of sensor nodes must multicast soil moisture data to different control centers. Design a hierarchical multicast routing strategy that minimizes energy consumption and control overhead. Include a flow diagram for your solution.	15	K2	CO3
		(OR)			
	b)	A rescue mission deploys a MANET to connect teams spread across a disaster-hit area with no infrastructure support. High mobility and frequent disconnections are observed. Analyze the issues in routing design for this scenario and recommend an appropriate routing approach with justification.	15	K4	CO2