SNS COLLEGE OF ENGINEERING

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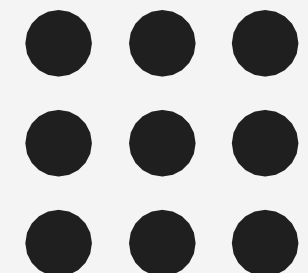
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Approved by AICTE, Recognized by UGC & Affiliated to Anna University, Chennai
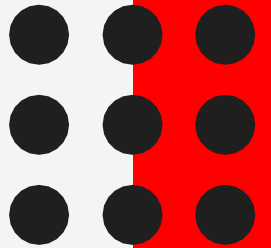
19EC701 - ADHOC NETWORKS

Unit -2 – DATALINK LAYER – CONTENTION BASED PROTOCOLS WITH DIRECTIONAL ANTENNA

Contention-based Protocols with directional antenna

- Advantages
  - Reduced signal interference, increase system throughput, and improved channel reuse

- Assumptions
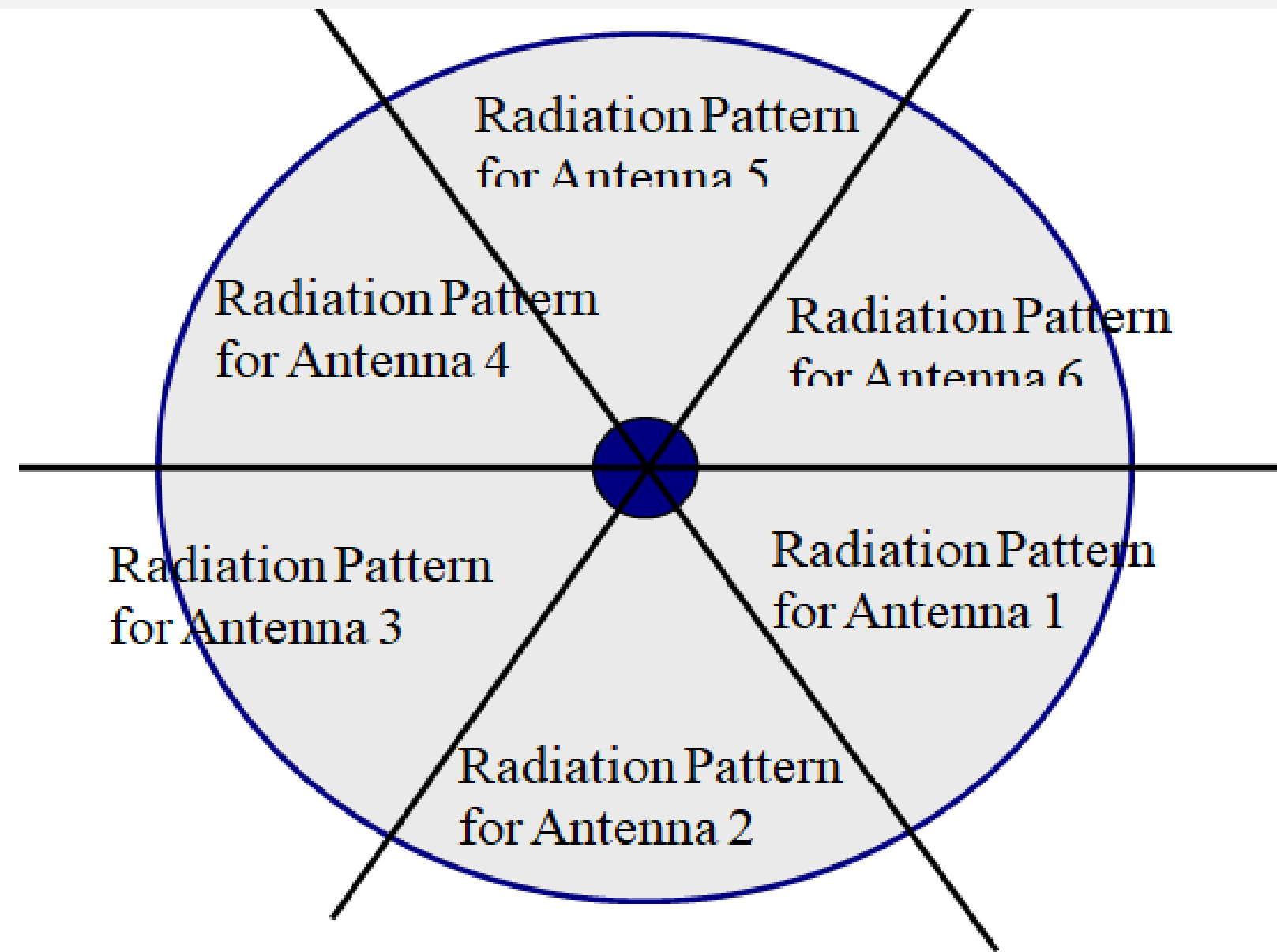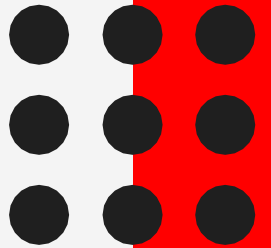 - Only one radio transceiver can transmit and receive only one packet at any given time

  - M directional antennas, each antennas having a conical radiation pattern, spanning an angle of $2/M$ radians

  - Adjacent antennas never overlap

- If a node transmits when all its antennas are active, then the transmission's radiation pattern is similar to that of an omni- directional antennas
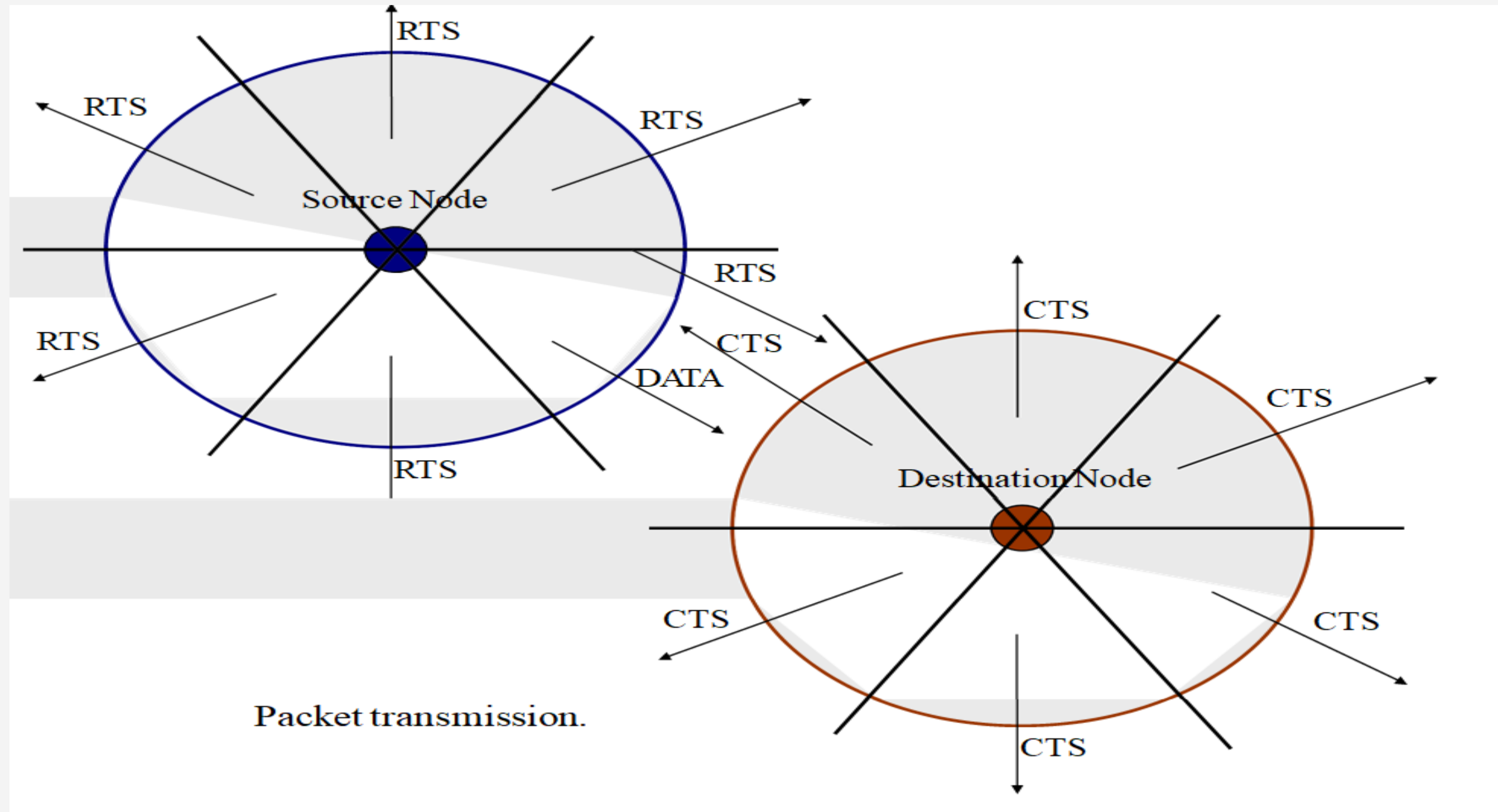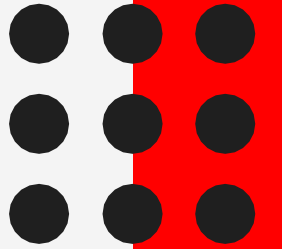
  - Packet transmission

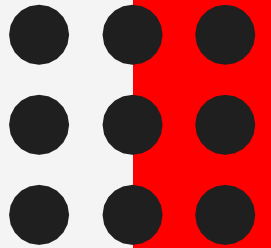Node with 6 antennas ($M = 6$)
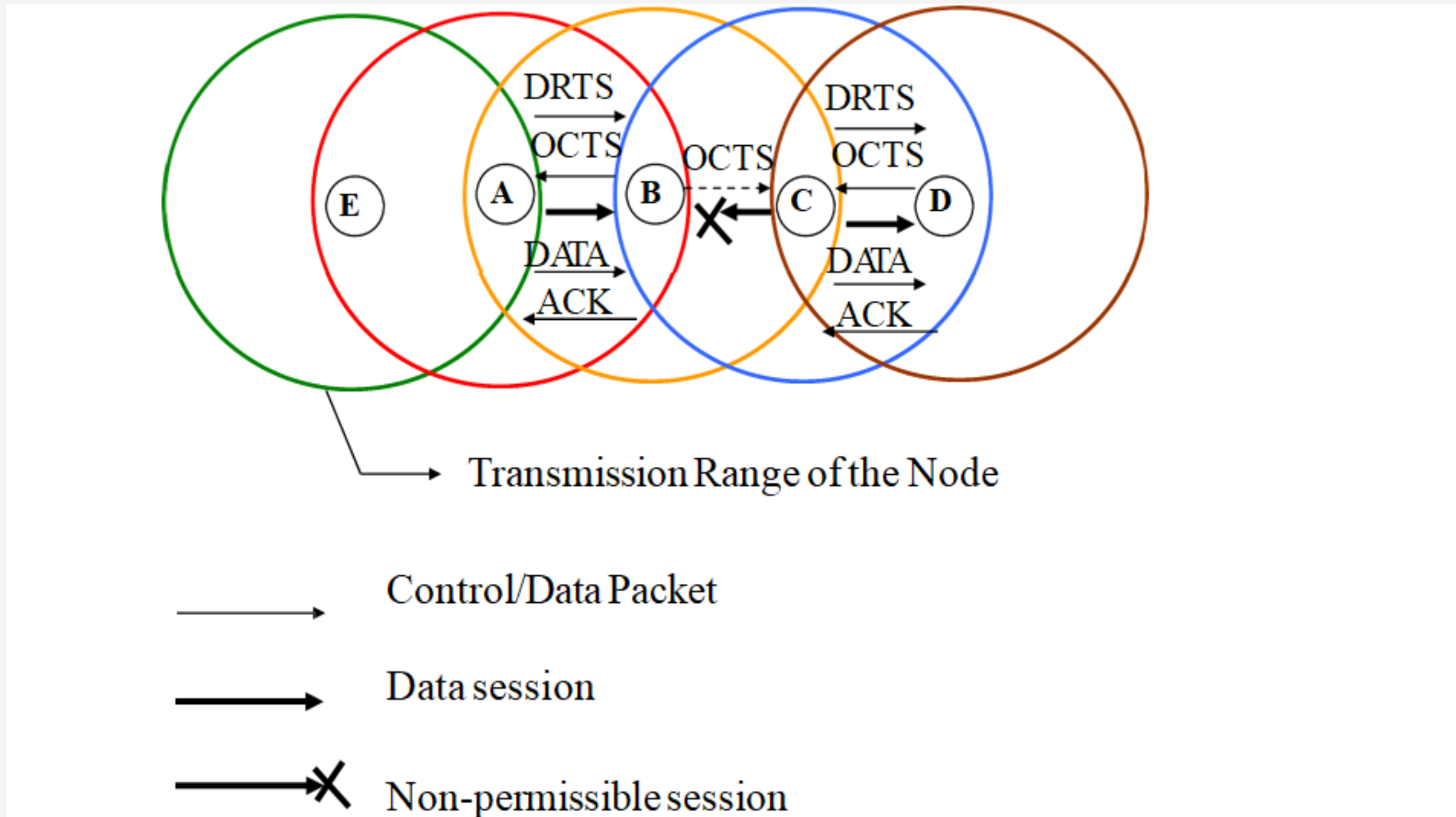
Radiation patterns of directional antennas.
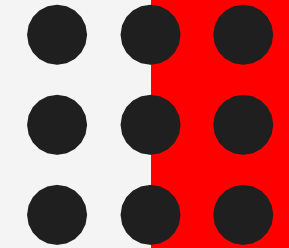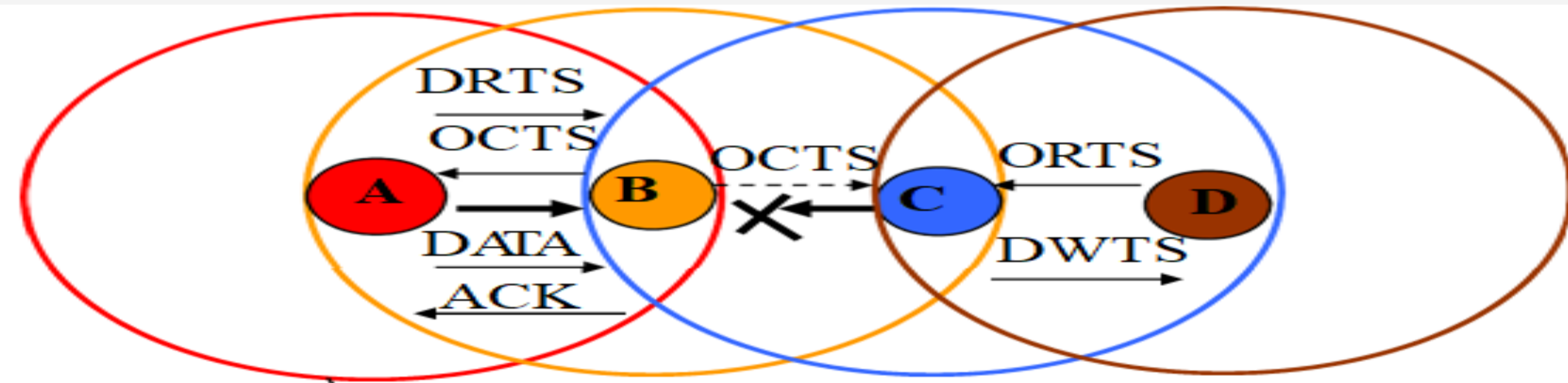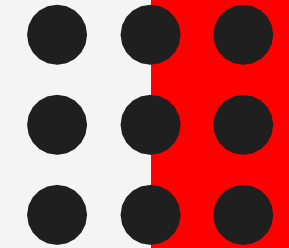
Packet transmission.

Directional MAC Protocols for Ad Hoc Wireless Networks

- D-MAC: assume each node knows about the location of neighbors
- In the first directional MAC scheme (DMAC-1)

  - Directional RTS (DRTS) omni-directional CTS (OCTS) Directional DATA

  (DDATA) Directional ACK(DACK)
  - May increase the probability of control packet collisions
  - (if node E send a packet to node A, it will collide the OCTS or DACK)
- In the second directional MAC scheme (DMAC-2)
  - Both the directional RTS (DRTS) and omni-directional RTS (ORTS) transmissions are used
    - Reduced control packet collisions
- Rules for using DRTS and ORTS:
  - ORTS: none of the directional antennas are blocked
  - DRTS : otherwise
  - Another packet called directional wait-to-send (DWTS) is used in this scheme

Transmission Range of the Node

Control/Data Packet

Data session

Non-permissible session

Operation of DMAC protocol.

Assessment

List out the assumptions of Contention based protocol using directional antenna?

THANK YOU