



**BRAINWARE UNIVERSITY**  
**Ph.D. Course Work Examinations**

Programme – Ph.D. in Computer Science and Engineering  
 Course Name – Wireless Sensor Network and Network Security  
 Course Code – PHD-CSE01B  
 (Semester – 1)

Time allotted: 4 hrs.

Full Marks: 100

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

**Group – A**

(Multiple Choice Type Questions)

1 x 10 = 10

1. Choose the correct alternative from the following :
  - i) State about Mobile communication
 

<ol style="list-style-type: none"> <li>a Allows to communicate from different locations without the use of physical medium</li> <li>c Allows to communicate from same locations without the use of physical medium</li> </ol>	<ol style="list-style-type: none"> <li>b Allows to communicate from different locations with the use of physical medium</li> <li>d Allows to communicate from same locations with the use of physical medium</li> </ol>
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  - ii) Identify the following is not an example of wireless communication.
 

<ol style="list-style-type: none"> <li>a Wi-Fi</li> <li>c Landline</li> </ol>	<ol style="list-style-type: none"> <li>b Mobiles</li> <li>d Wireless Computer Parts</li> </ol>
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  - iii) State \_\_\_\_\_ is a transmission method used in MIMO wireless communications to transmit encoded data signals independently.
 

<ol style="list-style-type: none"> <li>a MU-MIMO</li> <li>c SM</li> </ol>	<ol style="list-style-type: none"> <li>b STTD</li> <li>d Collaborative Uplink MIMO</li> </ol>
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  - iv) State about two channels are responsible for initiating mobile calls
 

<ol style="list-style-type: none"> <li>a FCC and RVC</li> <li>c FVC and RVC</li> </ol>	<ol style="list-style-type: none"> <li>b FVC and FCC</li> <li>d FCC and RCC</li> </ol>
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  - v) Select the following is not a TDMA standard of 2.5G network.
 

<ol style="list-style-type: none"> <li>a GPRS</li> <li>c HSCSD</li> </ol>	<ol style="list-style-type: none"> <li>b GSM</li> <li>d EDGE</li> </ol>
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  - vi) Select the following specifies a set of media access control (MAC) and physical layer specifications for implementing WLANs.
 

<ol style="list-style-type: none"> <li>a IEEE 802.11</li> <li>c IEEE 802.15</li> </ol>	<ol style="list-style-type: none"> <li>b IEEE 802.16</li> <li>d IEEE 802.3</li> </ol>
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- vii) Select which of the modulation scheme is used by Bluetooth.
- |   |      |   |       |
|---|------|---|-------|
| a | GFSK | b | DQPSK |
| c | BPSK | d | MSK   |
- viii) Relate the following explains the concept of diffraction loss.
- |   |                           |   |                    |
|---|---------------------------|---|--------------------|
| a | Archimedes' Principle     | b | Fresnel zone       |
| c | Principle of Simultaneity | d | Pascal's Principle |
- ix) Relate the following is not an effect caused by multipath in radio channel
- |   |                                  |   |                       |
|---|----------------------------------|---|-----------------------|
| a | Random frequency modulation      | b | Time dispersion       |
| c | Rapid changes in signal strength | d | Power of base station |
- x) Select the following is not a linear modulation technique.
- |    |              |    |       |
|----|--------------|----|-------|
| a. | $\pi/4$ QPSK | b. | OQPSK |
| c. | BPSK         | d. | FSK   |

### Group – B

(Short Answer Type Questions)

5 x 6 = 30

Answer the following questions :

2. Describe Characteristics of wireless sensor networks.
3. Explain the classification of MAC protocols.
4. Illustrate about various type of Security Attacks.
5. Explain the Public key cryptography principles.
6. Explain the Event Detection application.
7. Explain about Fault Tolerance.

### Group – C

(Long Answer Type Questions)

10 x 6 = 60

Answer the following questions :

8. Discuss Issues in designing a routing protocol.
9. Explain the note on: digital signatures, digital Certificates.
10. Briefly explain the current approaches of sensors.
11. Briefly explain the characteristics of wireless sensor network.
12. Explain the components of a sensor node
13. Explain the challenges in wireless sensor network.