

315339

25226

3 Hours / 70 Marks

Seat No. 

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- Instructions* – (1) All Questions are *Compulsory*.  
(2) Answer each next main Question on a new page.  
(3) Illustrate your answer with neat sketches wherever necessary.  
(4) Figures to the right indicate full marks.  
(5) Use of Non-programmable Electronic Pocket Calculator is permissible.  
(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

1. **Attempt any FIVE of the following:** **10**
- a) List the sensors used in mobile phone unit.
  - b) Define co-channel and Adjacent channel interference.
  - c) List any four features of 4G and 4G LTE.
  - d) State frequency range for following 5G Spectrum:
    - i) Mid band
    - ii) Ultra High band.
  - e) State any four applications of Bluetooth.
  - f) Draw neat labelled diagram of GSM architecture.
  - g) List features of IMT 2020 standard. (Any two)

P.T.O.

**2. Attempt any THREE of the following: 12**

- a) Draw set up of mobile phone unit. State function of each block.
- b) Compare GSM and IS-95 standards with following parameters:
  - i) Forward channel frequency
  - ii) Channel Bandwidth
  - iii) Multiple Access
  - iv) Sim card.
- c) Describe beam forming process in MIMO.
- d) Describe 5G radio spectrum and list the services provided by it.
- e) For covering large area, Wi-Max is used compared to WLAN. Justify the answer with the help of advantages of Wi-MAX.

**3. Attempt any THREE of the following: 12**

- a) State different wireless communication system and explain any one in detail.
- b) Describe Mobile originated call procedure with the help of diagram.
- c) Compare 3G, 4G and 5G on basis of following parameters.
  - i) Data rate
  - ii) Operating spectrum
  - iii) Services
  - iv) Bandwidth.
- d) With help of neat sketch, describe network slicing in 5G technology.
- e) Draw the system architecture of IEEE.802.11 standard. Also write down its features.

4. Attempt any THREE of the following: 12
- a) Define frequency Reuse and draw frequency Reuse pattern for  $N = 7$ .
  - b) Describe the function of GSM and control channels.
  - c) State the vision and services of IMT 2020 with its spectrum requirement.
  - d) List four application of vehicular communication and describe any one in detail.
5. Attempt any TWO of the following: 12
- a) List any four features of third generation (3G) cellular standard. State various 3G standards (TDMA and CDMA used.)
  - b) Draw a neat labelled diagram of GSM architecture and describe how it works in detail.
  - c) What is NFC? State any four NFC services. Describe any one NFC service in detail.
  - d) State the significance of 5G technology. Describe 5G enable technology in detail.
6. Attempt any TWO of the following: 12
- a) State the types of interference in cellular system. Explain any one type in detail.
  - b) Compare LTE and LTE-A on the basis of following parameters:
    - i) Generation
    - ii) Channel B.W.
    - iii) Data rate
    - iv) Frequency spectrum
    - v) Carrier frequency
    - vi) Services
  - c) Describe 5G network. List different function used in 5G network. State advantages of 5G network over 4G.
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