# PSG COLLEGE OF ARTS & SCIENCE
## (AUTONOMOUS)
## BSc DEGREE EXAMINATION MAY 2025
### (Sixth Semester)

### Branch – ELECTRONICS

### MAJOR ELECTIVE COURSE – II MOBILE TECHNOLOGY

Time: Three Hours                                          Maximum: 50 Marks

## SECTION-A (5 Marks)
### Answer ALL questions
### ALL questions carry EQUAL marks                    (5 x 1 = 5)

1   ----------is the major problem that occurs due to adjacent channel interference
   (i)   Cross talk                        (ii) Missed calls
   (iii) Blocked calls                     (iv)  Near-far effect

2   The major advantage of the CDMA technique is........
   (i)   High signal quality               (ii) Reduced interference
   (iii) Low spectral efficiency            (iv) Power control

3   _____ manages the switching function in GSM.
   (i)   Operation and Support Subsystem    (ii) Base Station and Support system
   (iii) Network and Switching Subsystem   (iv) Mobile Network center

4   GPRS stands for-----------
   (i)   General Process Receiver System    (ii) General Packet Receiver System
   (iii) General Process Radio Service      (iv) General Packet Radio Service

5   The data rate in UMTS Architecture is ------------
   (i)   2 MBPS                            (ii)   12 MBPS
   (iii) 20 MBPS                           (iv)   32 MBPS

## SECTION - B (15 Marks)
### Answer ALL Questions
### ALL Questions Carry EQUAL Marks                    (5 x 3 = 15)

6   a   If 20 MHZ of the total bandwidth is allocated for Duplex channels, in a Cellular wireless system with Frequency Reuse factor 4 and each Simplex channel is 25 KHZ radio frequency bandwidth, then find the number of Duplex Channels and the number of channels per Cell.
                     OR
   b   Summarize the Antennas for Mobile Communication systems.

7   a   Differentiate TDMA and FDMA
                     OR
   b   Describe the Space Division Multiple Access.

8   a   Explain the Authentication and Security in GSM Architecture.
                     OR
   b   Analyze the TDMA scheme used in GSM for Multiple Access.

9   a   Discuss the GPRS Location Management procedures.
                     OR
   b   Interpret the applications of GPRS.

10  a   Draw the diagram for UMTS Interfaces and explain it.
                     OR
   b   Examine the Mobility Management for UMTS Network.

## SECTION -C (30 Marks)
Answer ALL questions
ALL questions carry EQUAL Marks          (5 x 6 = 30)

11  a   Explain the Frequency Reuse concept in Mobile Technology
OR

   b   If the received power at a d0 = 1 km, is equal to 1 μWatt in the city area, find the received power at distances of 2 km from the same transmitter using Okumara–Hata model. Assume the height of transmitting antenna is $h_t$ = 40 m, receiving antenna $h_r$ = 3m, operating frequency f = 1800MHz.

12  a   In a GSM system with a 25-MHz forward link, there are 200 kHz radio Channels allocated for voice communication using TDMA/FDD, and each channel can support 8 simultaneous speech channels each with a time slot of 0.577 ms.
   (i)   What are the total numbers of users that can be supported?
   (ii)  What is the duration of a frame?
   (iii) What is the time gap between two successive transmissions for a particular user?
OR

   b   Discuss the Code Division Multiple Access in Wireless Communication.

13  a   Analyze the Operation Subsystem in GSM Network Architecture.
OR

   b   Describe the GSM protocols and signaling.

14  a   Draw the GPRS Network Architecture and explain.
OR

   b   Summarize the operation of GPRS Roaming.

15  a   With a neat diagram, describe the UMTS Network Architecture.
OR

   b   Describe the UMTS Handover process.

Z-Z-Z                    END