Code No: 157FM **R18**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, December-2023/January-2024

5G TECHNOLOGIES

(Computer Science and Engineering - Cyber Security)

Time: 3 Hours **Max.Marks:75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	What is LTE?	[2]
b)	What are 5G requirements?	[3]
c)	What is MIMO stand for in 5G?	[2]
d)	How is security efficiency is measured?	[3]
e)	Define filter bank multi carrier.	[2]
f)	What is non-orthogonal multiple access Noma for 5G radio technology?	[3]
g)	What is machine to machine communication?	[2]
h)	Illustrate radio resource management.	[3]
i)	Define millimeter communication?	[2]
j)	Give a brief note on the spectrum regulations.	[3]

PART – B

(50 Marks)

2.a) List out the advantages of 5G technology over 4G and 3G.
b) Which 5G band is used in India? Draw the clear spectrum allocation [5+5]

OR

3. Explain in detail about the various reforms evolved from 1G to 4G mobile technologies. [10]

4. Describe the concept of mm wave spectrum allocation in 5G. What are the unique characteristics of mm wave frequencies, and how do they impact 5G network performance and coverage? [10]

OR

5. List and explain in detail about the requirements of channel modeling. [10]

6. With a neat diagram explain the concept of Universal Filtered Multi-Carrier (UFMC) in detail. [10]

OR

7. What are the various concepts involved in generalized frequency division multiple accesses? Explain. [10]

8. Describe in detail about the various extensions of 4G device to device communication standardization to 5G. [10]

OR

9. Define multi hop transmission. Explain in detail about the multi-hop and multioperator Device to device communications. [10]

10. With the help of an example explain how channel estimate is calculated in massive MIMO. [10]

OR

11. Describe in detail about the concept of interference and mobility management. [10]

---ooOoo---