**Printed Page:-03** Subject Code:- AEC0603 Roll. No: NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA (An Autonomous Institute Affiliated to AKTU, Lucknow) **B.Tech** SEM: VI - THEORY EXAMINATION (2024 - 2025) Subject: 5G Technology **Time: 3 Hours** Max. Marks: 100 **General Instructions: IMP:** *Verify that you have received the question paper with the correct course, code, branch etc.* 1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice *Questions (MCQ's) & Subjective type questions.* 2. Maximum marks for each question are indicated on right -hand side of each question. 3. Illustrate your answers with neat sketches wherever necessary. 4. Assume suitable data if necessary. 5. Preferably, write the answers in sequential order. 6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked. \_. (CO1) 20 **SECTION-A** 1. Attempt all parts:-1-a. In a 5G network, cell tower is known as 1 dNodeB (a) eNodeB (b) (c) gNodeB hNodeB (d) 1-b. In 5G technology, the NR stands for? (CO1) 1 New Radio (a) (b) New Reach (c) New Range None of the above (d) 1 1-c. What is channel modelling? (CO2) The process of designing a communication channel (a) The process of simulating a communication channel (b) The process of optimizing a communication channel (c) (d) The process of testing a communication channel What is the significance of the time delay spread of the channel? (CO2) 1-d. 1 (a) It determines the frequency selectivity of the channel (b) It determines the coherence bandwidth of the channel (c) It determines the multipath effect in the channel

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	(d) It determines the Donnler spread of the channel	
1 .	Dropagetion within building is not influenced by (CO2)	1
1-e.	(CO3)	1
	(a) Layout of the building	
	(b) Construction materials	
	(c) Building type (d) Trace outside the building	
1.6	(d) These outside the building	1
I-I.	(CO3)	1
	(a) Large scale propagation model	
	(b) Small scale propagation model	
	(c) Fading model	
	(d) Okumura model	
1-g.	What is the definition of QoS?(CO4)	1
	(a) The process by which network resources are controlled to implement a give for a given user	en policy
	(b) A set of rules specifying the user plane services and functions available to a particular user, supplied by the network	ì
	(c) A value assigned to specific packets transmitted to/from a user that determine relative importance of transmitting those packets during the upcoming opportunit the medium	nes the y to use
	(d) The measurable end-to-end performance properties of a network service, we be guaranteed in advance by a service-level agreement (SLA) between a user and service provider	hich can a
1-h.	The handover in 5G is (CO4)	1
	(a) A mechanism that transfers the ongoing communication from one base statianother base station.	ion to
	(b) A mechanism that manages the interference between base stations.	
	(c) A mechanism that manages the interference between user equipments.	
	(d) A mechanism that transfers the ongoing communication from one user equipant another user equipment.	ipment to
1-i.	What is the purpose of network slicing? (CO5)	1
	(a) To provide customized network services to different types of applications a	nd users.
	(b) To reduce network latency.	
	(c) To increase network throughput.	
	(d) None of the above.	
1 <b>-</b> j.	Which of the following is not a benefit of SDN? (CO5)	1

- (a) Simplifies network management
- (b) Increases network latency

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(c) Enhances network agility and scalability

(0	l) Improves network security	
2. Attemp	pt all parts:-	
2.a.	What are the two main components of 5G? (CO1)	2
2.b.	What is the role of small cells in 5G propagation? (CO2)	2
2.c.	How do propagation channel models account for the effects of fading? (CO3)	2
2.d.	Explain the importance of handover in 5G? (CO4)	2
2.e.	What are the benefits of network slicing? (CO5)	2
<b>SECTIO</b>	DN-B	30
3. Answe	er any <u>five</u> of the following:-	
3-a.	Define use cases of 5G NR. (CO1)	6
3-b.	What is the function of protocol stack in 5G? (CO1)	6
3-c.	What are the key parameters of a mm Wave channel model?(CO2)	6
3-d.	How does 5G improve network coverage compared to 4G? (CO2)	6
3.e.	What is Massive MIMO and how does it differ from traditional MIMO? (CO3)	6
3.f.	What is Centralized Mobility Management? (CO4)	6
3.g.	What are the key components of a network slicing architecture? (CO5)	6
<u>SECTIO</u>	<u>N-C</u>	50
4. Answe	er any <u>one</u> of the following:-	
4-a.	What are key RAN components and functions in 5G network? (CO1)	10
4-b.	What is AMF? What is the essential function of AMF in 5G NR? (CO1)	10
5. Answe	er any <u>one</u> of the following:-	
5-a.	How does 5G impact IoT devices? Explain in detail.(CO2)	10
5-b.	How does the propagation of mm waves differ from that of lower frequency waves? (CO2)	10
6. Answe	er any <u>one</u> of the following:-	
б-а.	How does beamforming enhance the performance of wireless communication systems? Explain. (CO3)	10
6-b.	How does the number of array elements affect the performance of beamforming? Explain. (CO3)	10
7. Answe	er any <u>one</u> of the following:-	
7-a.	How is interference managed during handover in 5G networks? Explain. (CO4)	10
7-b.	Explain the IPv6 addresses with suitable diagram. (CO4)	10
8. Answe	er any <u>one</u> of the following:-	
8-a.	What is network slicing, and how does it work? (CO5)	10
8-b.	What are the main components of an SDN architecture, and how do they work together to create a programmable network? (CO5)	10

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