SSY145 Wireless Networks
Question Bank
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A question can have multiple correct answers.

1 Quiz A1 : Article 02a & 02b

1. A review of prior relevent literature is an essential feature of any academic project. Which of the following is/are true about writing the literature review?

   (a) A literature review is concept-centric.

   (b) A literature review is author-centric.

   (c) Writing a review not only requires an examination of the past research, but also means making a chart for the future research.

   (d) Past tense should always be used when writing about prior research.

2. Which of the below is/are correct about sections in an academic paper?

   (a) The abstract is placed in the beginning of a paper and it should be written at the very beginning of the research process.

   (b) The first paragraph of the introduction should concisely state on the objective of the work, and on why this objective is important.

   (c) A summary of the conclusions should be added to the introduction section.

   (d) It is usually not a good practice to combine results and discussion sections.

3. Which of the following is/are recommended by Jane Webster and Richard T. Watson, to determine the source material for the literature review?

   (a) It makes sense to start with leading journals as they are more likely to have major contributions.

   (b) In order to determine the prior articles, you should consider to go backward by reviewing the citations of the identified articles.

   (c) A complete review is better when the resource materials are confined to one research methodology, one set of journals, or one geographic region.

   (d) All of the above.

4. Which of the following statement is(are) correct about the tense in an academic paper?

   (a) When describing experimental results, use the present tense.

   (b) When attributing a statement or idea to a person, use the past tense.

   (c) When discussing concepts, use the present tense.

   (d) All of the above.

5. What is the primary purpose of an outline?

(a) To act as a detailed draft of the paper with full text.

(b) To serve as a written plan for organizing a paper, including the data on which it rests.

(c) To provide a list of references to be cited in the paper.

(d) None of the above.

6. What is the primary objective of research, and how can understanding the purpose and form of a paper help you in organizing and conducting your research?

(a) The primary objective of research is to collect data, and understanding the purpose and form of a paper can help in organizing the collected data.

(b) The primary objective of research is to formulate and test hypotheses, draw conclusions from these tests, and teach these conclusions to others. Understanding the purpose and form of a paper can be immensely useful in organizing and conducting research.

(c) The primary objective of research is to publish as many papers as possible, and understanding the purpose and form of a paper can help in increasing the number of publications.

(d) The primary objective of research is to collaborate with other researchers, and understanding the purpose and form of a paper can help in building a strong research network.

7. Which of the following statement is(are) correct?

(a) An outline should contain significant amount of text to be readable.

(b) The outline should be organized around text.

(c) One should start to construct an outline after finishing a project.

(d) None of the above.

8. What is/are the correct fact(s) about writing an outline?

(a) It is better to wait until the data collection is completed to start writing the outline.

(b) The outline is a written plan which organizes the paper.

(c) Classical approach in constructing an outline is to write down all important ideas that occur to you concerning the paper.

(d) Exchanging the outline and proposal with the supervisor, as early as possible will help to make the writing more efficient.

9. What is the recommended tone and tense when writing a literature review?

(a) Be constructive and respectful towards previous work, and use the present tense for discussing concepts.

(b) Be overly critical of previous work, and use the past tense for discussing concepts.

(c) Be constructive and respectful towards previous work, but use the past tense for discussing concepts.

(d) Be overly critical of previous work and use the present tense for discussing concepts.

10. Which of the following is/are true about identifying the source material for a review article?

(a) It is better to start with the leading journals as they are likely to make major contributions.

(b) Web of Science can be used to identify the articles that are citing a set of previously selected key articles.

(c) It is important to examine selected conference proceedings, especially the ones with a good reputation for quality.

(d) Examining conference proceedings wastes time and thus is not needed.

2 Quiz A2 : Lecture 02

1. Which of the following best indicate(s) appropriate use(s) of generative artificial intelligence (GAI) in academic writing?

(a) Verifying complex mathematical concepts.

(b) Clarifying complex theoretical concepts.

(c) Aiding with initial comprehension.

(d) Aiding with references for literature review.

2. Which question(s) is/are relevant while reading for a peer review?

(a) Does the paper provide significant contribution?

(b) Are all the technical details correct and sensible?

(c) Are there any serious ambiguities or inconsistencies?

(d) Do the methods used answer the research question?

3. Which of the following is/are **NOT** part of the writing process?

(a) Planning your writing.

(b) Copying intellectual property.

(c) Drafting.

(d) Revision.

4. Which of the following is/are purpose(s) of the introduction section?
   (a) Provide information about context.
   (b) Indicate motivation for the paper.
   (c) Define focus.
   (d) Explain document structure.

5. Which level of prompting involves asking a generative artificial intelligence (GAI) tool to ask you questions about your text?
   (a) Level 1: Immediate correction.
   (b) Level 3: Critical engagement.
   (c) Level 4: Interactive learning.
   (d) Level 2: Educational edit.

6. What are important factors to consider before you start writing a scientific article?
   (a) What research question you are investigating.
   (b) What audience you are writing for.
   (c) What genre the text is.
   (d) The title of the text.

7. How can revision process help with report writing?
   (a) For terminology check.
   (b) For argument support.
   (c) To identify whether the information presented is accurate and precise.
   (d) None of the above.

8. What is/are the purpose(s) of referencing in academic writing?
   (a) To establish the genre of the text.
   (b) To point to further reading options.
   (c) To give credit to the original source of the information/idea.
   (d) To indicate the motivation of the paper.

9. Which of the following is/are feature(s) that an abstract should contain?
   (a) It should persuade the reader.
   (b) It has to be written necessarily at the end of the writing process.
   (c) It should disseminate the information of your work done.
   (d) It should include personal opinions.

10. Which of the following option(s) for assisted reading through generative artificial intelligence (GAI) is/are the correct way(s) to use it?

(a) After reading a lengthy research paper, solely rely on GAI-generated summaries to obtain a quick overview of the main findings and conclusions.

(b) When reading a complex scientific article, use GAI to assist in explaining intricate theories or technical jargon, making the content more understandable for the reader.

(c) Use GAI-generated summaries to swiftly grasp the main findings and recommendations, and then conduct a comprehensive assessment through the relevant literature.

(d) Use GAI to summarize and organize unpublished works, incorporating them into their own report.

3 Quiz A3 : C2 – "Basic Principles of Wireless Networks"

3.1 C2 – "Basic Principles of Wireless Networks"

1. Which of the following statement(s) is/are true about channel coding?

(a) Coding increases the data rates and decreases the bit error rates.

(b) Coding increases both the data rates and the bit error rates.

(c) Coding decreases both the data rates and the bit error rates.

(d) Interleaving can help with burst errors.

2. Which of the following option(s) is/are correct regarding fading and its effects?

(a) Flat Fading (Has Doppler effect), Frequency Selective (No Doppler effect), Slow fading (has ISI), and Fast Fading (No ISI).

(b) Flat Fading (Has ISI), Frequency Selective (No ISI), Slow fading (Has Doppler effect), and Fast Fading (No Doppler effect).

(c) Flat Fading (No Doppler effect), Frequency Selective (Has Doppler effect), Slow fading (No ISI), and Fast Fading (has ISI).

(d) Flat Fading (No ISI), Frequency Selective (has ISI), Slow fading (No Doppler effect), and Fast Fading (Has Doppler effect).

3. Which of the below condition(s) characterize(s) flat fading?

(a) Signal bandwidth is lesser than coherence bandwidth.

(b) Delay spread is greater than symbol period (T_s).

(c) The range of frequencies in the spectrum is equally faded.

(d) Coherence time is small.

4. Which of the following statement(s) is/are delay spread counter measure(s)?

(a) Signal processing at the receiver.

(b) Signal processing at the transmitter.

(c) Change how antennas inject the radio waves into the environment.

(d) Encoding information in a more optimal manner.

5. What technique(s) can be used to "spread" the burst errors over many code words?

(a) Interpolation.

(b) Diversity.

(c) Delay spread.

(d) Inter-leaving.

6. Which of the following is/are **NOT** issue(s) with Multi-carrier Modulation?

(a) Large bandwidth penalty.

(b) Expensive low pass filters to maintain the orthogonality for sub-carrier at Receiver.

(c) The scheme requires N independent RF units and demodulation paths.

(d) The scheme requires a single RF unit and a single demodulation path.

7. Which of the following statement(s) is/are correct regarding wired connections compared to wireless connections?

(a) Each cable is a different channel.

(b) Signal attenuation is low in wired connections.

(c) Small to no interference in wired connections.

(d) Wired connections are always better.

8. Which of the following statement(s) is/are true about delay spread in the time domain interpretation?

(a) If the ratio between delay and period of the signal (τ/T) is small, then the inter-symbol interference is negligible.

(b) If the ratio between delay and period of the signal (τ/T) is large, then the inter-symbol interference is negligible.

(c) Distributed antenna systems can reduce/mitigate the delay spread.

(d) All of the above.

9. Which of the following MIMO gain is/are best relating with the concept of transmitting different information, creating multiple spatial streams to one or several users?

(a) Diversity gain.

(b) Spatial multiplexing gain.

(c) Array gain.

(d) Interference suppression gain.

4 Quiz A4 : C3 - Multi-carrier communications, Article 05a & 05b

4.1 C3 – "Multi-carrier Communications"

1. Which of the following is/are true about adding a cyclic prefix?

   (a) It removes ISI but also affects orthogonality.

   (b) It removes ISI and ICI while preserving orthogonality.

   (c) Regardless of the dekay, orthogonality is preserved.

   (d) It comes at the cost of power and spectral efficiency.

2. In the architecture of Orthogonal Frequency Division Multiplexing (OFDM) systems, which of the following statement(s) accurately reflect(s) the correct understanding of its components and their function(s)?

   (a) The cyclic prefix (CP) in OFDM systems is primarily designed to enhance the system's bandwidth efficiency by allowing for tighter frequency packing of the subcarriers.

   (b) The use of Fast Fourier Transform (FFT) at the OFDM receiver and its inverse (IFFT) at the transmitter is primarily to ensure that the signal occupies the entire available bandwidth, thereby maximizing the spectral efficiency of the system.

   (c) OFDM utilizes the Inverse Fast Fourier Transform (IFFT) at the transmitter to convert the frequency-domain data into a time-domain signal for transmission, and the Fast Fourier Transform (FFT) at the receiver to convert the received time-domain signal back into the frequency domain.

   (d) The orthogonality in OFDM is achieved by transmitting all subcarriers at the same power level, ensuring equal signal strength across the spectrum.

3. Which of the following cause(s) the intersymbol interference to be almost completely eliminated in OFDM?

   (a) Automatic repeat request.

   (b) Guard time.

   (c) Amplifiers.

   (d) None of the above.

4. Which of the following statement(s) about Orthogonal Frequency Division Multiplexing (OFDM) is/are correct?

(a) OFDM implements multi-carrier modulation with virtual carriers using IDFT/DFT.

(b) OFDM is less sensitive to non-linear amplifiers and phase noise than single-carrier.

(c) DFT-precoded OFDMA is a method to implement single- carrier like modulation using an OFDM transceiver.

(d) All of the above.

5. What is/are the reason(s) for splitting up a large bandwidth B into smaller subcarriers?

(a) Getting higher capacity.

(b) Get flat frequency response in each subcarrier.

(c) Avoid needing to use multi-tap equalizers.

(d) Minimzing the inter-symbol-interference (ISI).

6. Which of the below is/are countermeasure(s) for inter-carrier-interference (ICI)?

(a) Send stronger signals.

(b) Adding a cyclic prefix to each subcarrier.

(c) Inserting guard time.

(d) None of the above.

7. Which of the following is/are true about the insertion of a guard time after each OFDM symbol?

(a) Guard time helps eliminating almost completely the inter-symbol interference.

(b) Guard time should be chosen smaller than the delay spread.

(c) The OFDM symbol length should be chosen such that the guard time does not dominate.

(d) All of the above.

4.2 Article 05a - "5G New Radio: Unveiling the Essentials of the Next Generation Wireless Access Technology" and 05b - "5G NR Release 16: Start of the 5G Evolution"

8. What are the two frequency ranges defined in Release 15 for 5G New Radio?

(a) FR1: 100 MHz–1 GHz and FR2: 1 GHz–10 GHz.

(b) FR1: 200 MHz–5 GHz and FR2: 10 GHz–40 GHz.

(c) FR1: 410 MHz–7.125 GHz and FR2: 24.25 GHz–52.6 GHz.

(d) FR1: 300 MHz–3 GHz and FR2: 3 GHz–30 GHz.

9. What is the purpose of Bandwidth Part (BWP) in 5G New Radio?

(a) To increase interference between cells.

(b) To allocate a fixed amount of bandwidth for each user.

(c) To reduce device power consumption by allowing dynamic bandwidth adaptation.

(d) To support only wide bandwidth transmissions.

10. What are the two types of NR synchronization signals?

(a) Primary Synchronization Signal (PSS) and Tertiary Synchronization Signal (TSS).

(b) Primary Synchronization Signal (PSS) and Secondary Synchronization Signal (SSS).

(c) Primary Synchronization Signal (PSS) and Secondary Synchronization Signal (SSS).

(d) Tertiary Synchronization Signal (TSS) and Quaternary Synchronization Signal (QSS).

11. How many layers can the symbols of a single codeword be mapped on for the Physical Downlink Shared Channel (PDSCH)?

(a) One.

(b) Two.

(c) Up to four.

(d) Up to eight.

12. Which of the following enhancement(s) is **NOT** included in Release 16 of 5G NR?

(a) Cross-link interference mitigation.

(b) Multiple-input multiple-output enhancements

(c) UE power savings.

(d) Mobile IAB.

13. Which frequency band is anticipated to be the most relevant for IAB?

(a) Low-frequency spectrum.

(b) Medium-frequency spectrum.

(c) Millimeter-wave spectrum.

(d) Infrared spectrum.

14. In NR Release 16 sidelink, what type(s) of communication is/are supported to provide highly reliable communication links with appropriate QoS characteristics for ITS services?

(a) Unicast only.

(b) Groupcast only.

(c) Broadcast only.

(d) Unicast, groupcast, and broadcast.

15. Which of the following is **NOT** a use case for advanced vehicle-to-anything (V2X) communications in NR Release 16?

(a) Vehicles platooning.

(b) Cooperative communication using extended sensors.

(c) Advanced driving (including collision avoidance and cooperative lane change).

(d) Video streaming for passengers .

5 Quiz A5 : C4 – "5G and beyond - Part I", Article 06 - Connecting a Cyber-Physical World

5.1 C4 – "5G and beyond - Part I"

1. Which of the following statement(s) is/are true for channel depenedent scheduling?
   (a) Fading makes the channel conditions of each user vary with time.
   (b) Needs careful consideration in order to be "fair".
   (c) Downlink channel quality dependent scheduling is done at the base station.
   (d) None of the above.

2. Which of the below component(s) is/are responsible for scheduling downlink based on channel quality?
   (a) Core Network.
   (b) Base Station.
   (c) User equipment (UE).
   (d) None of the above.

3. Which of the following best relate(s) to unlicensed spectrum?
   (a) Exclusive rights to a certain frequency range.
   (b) Anyone can use the radio frequencies.
   (c) No license cost.
   (d) Used in LTE.

4. Which of the following statement(s) is/are true about handling occasional reception errors?
   (a) Handled using ciphering.
   (b) Handled using RLC retransmission as a reliable solution which has a selective repeat protocol, with status reports sent inband.
   (c) Handled using Hybrid-ARQ retransmissions as a fast solution which handles most errors and indicate success/failure outband after the reception of each scheduled data unit.
   (d) All of the above.

5. What statement(s) is/are true regarding beamforming in multi-antenna systems?
   (a) In higher frequency bands, beamforming is mainly used to increase coverage.
   (b) In lower frequency bands, beamforming is mainly used to increase coverage.
   (c) In lower frequency bands, beamforming is mainly used to increase capacity.
   (d) In higher frequency bands, beamforming is mainly used to increase capacity.

6. Which of the below is/are New Radio (NR) characteristics?
   (a) Ultra Lean Design.
   (b) Forward compatability.
   (c) Wide spectrum range.
   (d) Peak data rate is 300 Mbit/s DL, 75 Mbit/s UL.

7. In which state(s) do/does the mobility is controlled by the device in a LTE network?
   (a) RRC_INACTIVE.
   (b) RRC_IDLE.
   (c) RRC_CONNECTED.
   (d) None of the above.

8. Which of the below statement(s) correctly explain(s) 'Paging'?
   (a) The process after establishing a connection where private keys are exchanged to encrypt the channel and prevents eavesdropping.
   (b) A process that allows to switch from the license spectrum to the unlicensed spectrum, whenever possible.
   (c) A mechanism through which the network initiates communication with the UE in an Idle state. The UE must periodically check whether the network is sending the paging messages.
   (d) None of the above.

9. Which of the following is/are true about licensed and unlicensed spectrums for managing the allocation of frequencies in wireless communication systems?
   (a) In licensed spectrum frameworks, entities acquiring licenses are allocated specific frequency ranges, granting them exclusive rights for utilizing those frequencies.
   (b) In unlicensed spectrum frameworks, specific frequency ranges are assigned to the entities that acquire the licenses, in order to have exclusive rights to use those frequencies.
   (c) In unlicensed spectrum frameworks, the quality and reliability of communication can be affected by interference.
   (d) All of the above.

5.2 Article 06 - 6G – Connecting a cyber-physical world

10. Which of the following is a benefit of making device behaviors more programmable in 6G networks?

(a) Slower bug fixing.

(b) Limiting the speed of development.

(c) Faster feature development and time to market.

(d) Relying on hardcoded device behaviors.

11. Which frequency bands will remain important in the 6G era for providing wide-area coverage for 6G services?

(a) Above 100 GHz.

(b) 24 GHz to 52 GHz.

(c) Up to about 6 GHz.

(d) 7–24 GHz.

12. What are some examples of non-terrestrial (NT) access components that could be used to achieve truly global coverage for future wireless connectivity?

(a) Drones.

(b) High-altitude platforms (HAPS).

(c) Low-Earth orbit (LEO) satellites.

(d) All of the above.

13. What are the two ways cognitive networks are expected to help improve energy efficiency, optimize performance, and ensure service availability?

(a) Traditional algorithms and machine reasoning.

(b) Machine learning and machine reasoning.

(c) Traditional algorithms and human input.

(d) Human input and machine learning.

14. Which of the following is/are requirement(s) for applications developed to interact with physical reality?

(a) Centralized deployment.

(b) Limited deployment flexibility.

(c) Highly distributed designs.

(d) Reduced interaction with sensors and actuators.

15. What is/are the purpose(s) of network compute fabric in 6G networks?

(a) To focus solely on connectivity.

(b) To provide computing intertwined with communication for high efficiency and dependability.

(c) To reduce energy efficiency.

(d) To serve as a platform for centralized applications only.

16. What is/are some key aspect(s) required for an autonomous system to be successful and trusted by humans?

(a) Ability to explain its actions.

(b) Technically robust and act ethically.

(c) Involve humans when needed.

(d) All of the above.

6 Quiz A6 : C5 – "5G and beyond - Part II", Article 07 - mmWave-5G

6.1 C5 – "5G and beyond - Part II"

1. Which of the following is/are use case scenario(s) from the ITU wheel diagram?
   (a) Ubiquitous Connectivity.
   (b) Low reliability and hyper latency communication.
   (c) Integrated sensing and communication.
   (d) AI and Communication.

2. Which of the following statement(s) is/are true regarding the technologies for 6G?
   (a) The "cm-wave" spectrum focus for 6G is mainly on 7-15 GHz.
   (b) 6G will not build upon the 5G MIMO framework, but will instead develop a completely new approach.
   (c) Massive MIMO in 6G will support a significantly larger number of antenna elements.
   (d) "sub-THz" spectrum should be part of the first 6G release.

3. Which of the following statement(s) is/are true about Non-Terrestrial Networks (NTN)?
   (a) NTN cannot provide coverage and resilience as a complement to terrestrial access.
   (b) Deployments for NTN focus on Low Earth Orbit (LEO), both handheld and VSAT terminals.
   (c) Basic NTN connectivity is possible with 6G mandatory UE features.
   (d) The main challenges of NTN include short delays and low doppler shift.

4. Which of the below usage scenario(s) is/are to be developed in 6G, with roots from 5G?
   (a) Immersive communication.
   (b) Massive communication.
   (c) Hyper Reliable and Low-Latency Communication.
   (d) Ubiquitous Connectivity.

5. Which of the following is/are correct about Lean design in 6G?

   (a) In order to enhance lean design in time domain, there will be a further reduction of duty cycle for "always on" signals.

   (b) In order to enhance lean design in frequency domain, carriers with different purposes transmit different signals.

   (c) There is no will to extend lean design to Node domain.

   (d) All of the above.

6. Which of the following statement(s) is/are regarding Non-terrestrial networks (NTN)?

   (a) NTN aims to replace terrestrial access technologies entirely.

   (b) NTN deployments primarily focus on geostationary orbit (GEO) satellites.

   (c) Basic NTN connectivity can be achieved with 6G mandatory UE features.

   (d) NTN relies heavily on external technologies such as GNSS.

7. Which of the following statement(s) of Spectrum for 6G is/are true?

   (a) All spectrum currently used by 3GPP systems can be used in 6G.

   (b) The cm-wave spectrum can be used in 6G.

   (c) Waveform and numerology does not align with 5G.

   (d) None of the above.

6.2 Article 07 - "mmWave-5G"

8. What is one of the challenges faced by mm-wave propagation compared to systems operating at lower frequencies?

   (a) The free space path loss increases with the square of the frequency due to the antenna aperture size reducing at the same rate.

   (b) The free space path loss decreases with the square of the frequency due to the antenna aperture size increasing at the same rate.

   (c) The penetration losses through buildings and other clutter decreases with higher frequencies.

   (d) The number of antenna elements that can be packed into a given area decreases with the square of the frequency.

9. What is a possible approach to address the bottleneck of needing a large number of RF chains with high-resolution converters in mm-wave communication systems?

(a) Increase the resolution of the converters.

(b) Employ only fully digital beamforming.

(c) Employ hybrid beamforming, where part of the beamforming operations are performed in the analog domain and the other part in the digital baseband.

(d) Use a network of phase shifters or switches only in the digital domain.

10. Which of the following statements is/are **NOT** correct about 5G?

(a) 5G promises twenty times peak data rates compared to LTE.

(b) 5G is allocated the millimeter wave frequency band (6–100GHz).

(c) 5G will have less number of small cells compared to LTE.

(d) All of the above.

11. Which of the below is/are correct regarding the multi-node cooperation among mm-wave nodes?

(a) It can help to support higher mobility with seamless user experience.

(b) The multi-node coordination in mmWave HetNets potentially do not consume higher amounts of power.

(c) The multi-node coordination in mmWave HetNets is not a trivial task due to the higher degree of complexity needed for its feasibility.

(d) To provide the needed dynamic clustering for multi-node cooperation, a tight interaction and co-design with the backhaul network and network architecture is important.

12. mmWave communication face more challenges than the prior systems that operate at lower frequencies. Which of the following statements relating to their high resolution converters (DAC/ADC) is/are correct?

(a) A small number of high resolution converters are sufficient, due to the increased dimensionality of the transmit/receive antenna arrays and the large bandwidths envisioned for mmWave communication.

(b) Often in the market, the needed converters with a high sampling rate and high resolution are cheap.

(c) Those converters consume higher amount of power and thus the goal to achieve better energy efficiency in future wireless communications is at stake.

(d) By using hybrid beamforming, the large amount of high resolution converters needed can be reduced.

7 Quiz A7 : C6 – "mmWave and sub-THz Communications in 5G and Beyond", Article 08a - Cellular V2X and Article 08b - 6G Hexa-X

7.1 C6 – "mmWave and sub-THz Communications in 5G and Beyond"

1. Which of the following is/are part(s) of METIS overall technical Goals?
   (a) 100 times higher battery life for low power Massive Machine Communication (MMC) devices.
   (b) 10 to 100 times higher number of connected devices.
   (c) 10 times reduced End-to-End Latency.
   (d) 10 to 100 time higher typical user data rates.

2. What is **NOT** hardware impairment(s) for 5G communications?
   (a) Phase noise.
   (b) Ray tracing.
   (c) A/D, D/A converters.
   (d) I/Q Imbalance.

3. Which of the following statements is/are correct about potential(s) of Multi-node Cooperation in mm-wave systems?
   (a) Standalone (homogeneous) systems can increase multipath and thus (distributed) MIMO rank to better support (distributed) spatial multiplexing and massive MIMO gains at sparse mmWave channels.
   (b) Non-standalone (Heterogeneous macro/mm-wave) systems provide high latency and frail out-of-band control.
   (c) Non-standalone (Heterogeneous macro/mm-wave) systems can provide coverage of mm-wave blind spots.
   (d) Standalone (Homogeneous) systems do not provide macro-diversity gains towards shadowing/blocking.

4. What is/are the purpose(s) of Coordinated Multi-Point (CoMP)?
   (a) To get smoother capacity.
   (b) To get a simpler network.
   (c) Lower the interference.
   (d) Avoid macro-diversity.

5. Which of the following is/are type(s) of beamforming search algorithm?

(a) Link-by-link Search.

(b) Two-level Search.

(c) Three-step Search.

(d) Tabu Search.

6. What is adaptive Coordinated Multi Point(CoMP)?

(a) A complex algorithm for optimizing network traffic.

(b) A type of cellular network architecture that uses multiple base stations to cooperatively serve user equipment.

(c) A method for improving data security in cellular networks.

(d) None of the above.

7. Which of the following is/are correct about the approaches to implement Coordinated Multi-Point (CoMP)?

(a) In Coordinate Scheduling or Beamforming, the base station coordinates the process by transmitting the data to a single user by one transmission point.

(b) In Coordinated Joint Transmission the data is transmitted to a single user by multiple transmission points, and therefore user data needs to be exchanged between nodes.

(c) Coordinated Scheduling or Beamforming requires exchange of user data between nodes.

(d) All of the above.

8. Which of the following statement(s) regarding Partial Joint Processing in Adaptive Coordinated Multi-Point (CoMP) is/are true?

(a) Sub-clusters of base stations are defined for each user in the cluster.

(b) Multiuser interference is introduced, so that more requirements on feedback and backhaul are needed.

(c) Possible to find robust close to optimum Partial Joint Processing (PJP) schemes that lowers feedback and backhaul load

(d) Partial Joint Processing (PJP) in Adaptive CoMP aims to optimize resource allocation and signal transmission efficiency.

7.2 Article 08a - Cellular V2X and Article 08b - 6G Hexa-X

9. What is/are the key functionality/ies carried out by the SDN orchestrator in IoT applications?

(a) Resource allocation in distributed fog nodes.

(b) Facilitating to transport large amounts of data from terminals, nodes to distributed computing nodes or core data center.

(c) Make proper decisions based on the collected data, which eventually leads to the concept of cognition.

(d) Handling privacy and security.

10. Which of the below statement(s) is/are true regarding integrated moving networks?

(a) Designing of closed-loop and cooperative interference coordination mechanisms in ultradense HetNets remains as an open research topic.

(b) The sole purpose of the moving base stations is to efficiently serve the users inside the vehicles, but not the users outside.

(c) Integrated moving networks can enable ultra reliable communication links between vehicles and mobile devices in-order to transport intelligent transport systems (ITS) messages.

(d) All of the above.

11. Channel models can be classified into two major types based on the target application and performance metric. Identify the correct statement(s) regarding Geometry-based deterministic (GBD) models.

(a) They can be further classified into system-level and link-level models.

(b) System-level models are concerned about the small scale fading.

(c) They are based on the statistics obtained from measurements for a specific environment.

(d) Most of the prominent GBD models are based on ray tracing.

12. Which of the following initiatives are working on forming the 6G vision?

(a) Hexa-X project.

(b) Next G Alliance.

(c) Smart Networks & Services Joint Undertaking.

(d) Resilient & Intelligent NextG Systems (RINGS).

13. Which of the following research challenges is/are focused on addressing mass-scale deployment, wide-area and specialized networks, and seamless operation?

(a) Connecting intelligence.

(b) Network of networks.

(c) Sustainability.

(d) Global service coverage.

(e) Trustworthiness.

14. Which frequency band is being targeted for 6G to achieve extreme radio performance such as access data rates above 100 Gbps and localization accuracy at 1 cm range?

(a) Low band (< 6 GHz).

(b) Lower mmWave band (30 – 100 GHz).

(c) Upper mmWave band (100 – 300 GHz).

(d) THz band (300 GHz – 1 THz).

15. Which of the following challenges should be carefully studied in the coming years to achieve extreme radio performance in 6G systems?

(a) Network of networks.

(b) Trustworthiness.

(c) Radio technology, hardware capability, and propagation channels.

(d) Sustainability.

16. What are the three main aspects Hexa-X focuses on to enable AI-driven communication and computation co-design holistically for 6G?

(a) Network of networks, trustworthiness, and sustainability.

(b) Propagation channels, hardware capability, and radio technology.

(c) AI enablers, AI governance, and predictive orchestration.

(d) Extreme radio performance, network of networks, and sustainability.

17. In the Hexa-X project, what are the three areas into which the underlying KPIs are proposed to be clustered?

(a) Extreme evolution of capabilities.

(b) Revolution of new end-to-end measures.

(c) New capabilities.

(d) UN SDG targets.

18. In the context of 6G, what are two ways that ICT can contribute to the reduction of greenhouse gas emissions, according to GSMA?

(a) By providing health services to remote areas.

(b) By contributing to a 10 times greater level of avoided emissions than the global carbon footprint of mobile networks themselves.

(c) By reducing the global carbon footprint of mobile networks.

(d) By enabling remote education.

8 Quiz A8 : Article 09

1. Which of the below statement(s) is/are correct about E-band?

   (a) In some countries license fee per hop in E-band is considerably less than that of lower frequencies.

   (b) Main driver for the expansion of the E-band usage is its speed, flexibility and the availability of a lot of spectrum.

   (c) E-band is unique in enabling narrow beams when compared with those of lower frequencies.

   (d) Mast sway in E-band backhaul networks should be considered, but with tools for careful planning and monitoring it is often possible to mitigate the effect.

2. Which of the below statement(s) is/are correct about fixed wireless access (FWA) and microwave?

   (a) When expanding FWA to a site without fiber-connection, E-band microwave can be used as a good alternative.

   (b) Ericsson forecasts FWA connections to represent 25% of global mobile data traffic by 2026.

   (c) Due to its high-latency, microwave is not suitable to support online gaming.

   (d) Transport network is crucial to ensure successful FWA services, and microwave backhaul provides a scalable and future-proof solution in this regards.

3. Which of the below statement(s) is/are correct regarding network slicing and microwave technology?

   (a) Microwave technology supports network slicing using standard packet technologies and Quality of service (QoS) schemes.

   (b) A network slice, or group of network slices, can only contain traffic from one traffic class, and thus a hierarchical identification principle is not needed.

   (c) It is recommended to implement support for network slicing in transport domain using standard packet technologies in order to ensure efficient use of resources.

   (d) It is recommended to implement support for network slicing in transport domain using Time Division Multiplexing (TDM)-like solutions in order to ensure efficient use of resources.

4. What is the primary purpose of using hierarchical identification in network slicing?

   (a) To ensure proper interworking between internal packet and radio link systems.

   (b) To simplify the architecture of the transport domain.

   (c) To handle network slices with multiple traffic classes.

   (d) To minimize the use of resources in the network.

5. What is the main advantage of using wider channel bandwidth in a microwave backhaul network?

(a) Lower rain loss per km.

(b) Higher interference.

(c) Lower transmit power requirements.

(d) Higher SINR.

6. Which of the following can be used as an identifier for a network slice in the packet headers?

(a) DSCP only.

(b) IP-address.

(c) IPv6 flow label.

(d) C-VLAN.

7. According to the Ericsson Outlook report, what is the maximum capacity offered by microwave transport with E-band or Multi-band solutions for new or existing sites?

(a) 1.4 Gbps.

(b) 5 Gbps.

(c) 10 Gbps.

(d) 30 Gbps.

9 Quiz A9: C7– "Cellular V2X and Outlook Towards 6G", C8 - Wireless Backhaul - Introduction and Evolution, Article 10 - "Space Communication"

9.1 C7– "Cellular V2X and Outlook Towards 6G"

1. Which of the following is/are use case(s) of 5GCAR?
   (a) Extend local perception with sensor data shared by surrounding vehicles.
   (b) Interact with other vulnerable road users.
   (c) Remotely control and monitor via the cloud in critical situations.
   (d) Enhance vehicle users' streaming capability to support a fun journey (entertainment purposes).

2. Which of the following best relate(s) to cooperative safety use case in 5GCAR?
   (a) Controlling the different actuators of the car through wireless communication.
   (b) Exchanging the information about detection of the presence of road users.
   (c) Sharing local awareness, driving intentions and negotiating the planned trajectories.
   (d) Exchanging data from different sources from on-board cameras.

3. Which of the following is/are potential mutual benefit(s) of Integrated Moving Networks?
   (a) Better mobile systems efficiency.
   (b) More reliable and secure access to C-V2X services.
   (c) New disruptive business opportunities.
   (d) Increased fuel consumption.

4. What is/are potential function(s) in Intelligent Transportation Systems?
   (a) Forward collision warning.
   (b) Road Works Warning.
   (c) Intersection Movement Assist.
   (d) Lane change warning/blind spot warning.

5. Which of the following is/are correct about mutual opportunities in Integrated Moving Networks?

(a) Better efficiency of mobile systems.

(b) More reliable and secure access to C-V2X services.

(c) Generation of new disruptive business opportunities.

(d) None of the above.

6. What is/are requirement(s) of Moving Networks for V2X communications?

(a) High-data rate, low Latency.

(b) Only high data rate.

(c) Low-medium data-rate, low latency, high reliability.

(d) Low-medium data-rate, low latency, low reliability.

9.2 C8– "Wireless Backhaul - Introduction and Evolution"

7. Which of the following is/are true about the use of MIMO in microwave propagation?

(a) Antenna separation is typically less than 10 wavelengths.

(b) Line of sight (LOS) propagation is exploited.

(c) Exploiting antenna/channel orthogonality, paves way for small antenna separation in wavelengths.

(d) Line-of-Sight (LOS) results in high signal-to-noise ratio (SNR).

8. Which of the following is/are Backhaul licensing scheme(s)?

(a) Individual Licensing.

(b) Block licensing.

(c) Stream licensing.

(d) Light licensing.

9. Which characteristic(s) from higher and lower frequencies is/are combined to improve performance in multi-band boosting?

(a) The higher bandwidth of lower frequencies.

(b) High availability of lower frequency signals.

(c) The high capacity of higher frequency signals.

(d) The high availability of higher frequencies.

10. What are the two main regions that are significantly deploying microwave backhaul between 2023-2028?

(a) North America.

(b) India. backhaul.

(c) China and North East Asia.

(d) Africa.

11. Which of the following is/are advantage(s) of using water repellant antennas?

(a) Prevents rain, snow & ice build up.

(b) Improves system gain performance during rain and snow.

(c) Allows for smaller antennas, longer hops or higher availability.

(d) Only a and b.

12. What is/are the best relate with advantage(s) of a multi-band booster solution in telecommunications?

(a) It reduces rain fading.

(b) It combines the benefits of high availability and high capacity.

(c) It prioritizes traffic during strong fades.

(d) All of the above.

13. What is/are true about pooling base band processing?

(a) It increases the efficiency of processing.

(b) It creates flexibility.

(c) It relaxes the requirements on the fronhaul link.

(d) It allows more base stations (BSs) to be connected.

14. What is/are the main aspect(s) to be considered in order to calculate the optimal antenna seperation in MIMO design?

(a) The number of antennas.

(b) The wavelength (frequency).

(c) Hop length.

(d) All the above.

15. Which of the following is/are correct about Multi-band booster?

(a) Multi-band booster is a solution that combines high availability and high capacity to enhance the coverage and the quality of the signal across multiple frequency bands.

(b) High frequencies have higher availability but narrower bandwidth.

(c) Lower frequencies have higher availability but narrower bandwidth.

(d) All of the above sentences are correct

9.3 Article 10 - Space Communication

16. Identify the correct statement(s) from the below for antenna arrays in satellite-based cellular systems.

(a) Typically, the feed element size of a large deployable reflector system with observation capability in 5 GHz ($\lambda \approx 6$ cm) is in the range of 6 cm to 12 cm.

(b) Typically, the feed element size of a large deployable reflector system with observation capability in 5 GHz ($\lambda \approx 6$ cm) is in the range of 3 cm to 6 cm.

(c) In order to avoid grating lobes, array systems generally need to place their elements far apart (long distance away from each other).

(d) For an array system with observation capability in 5 GHz ($\lambda \approx 6$ cm), the elements need to be placed 3 cm to 6 cm apart in order to avoid grating lobes.

17. Which of the following are feature(s) of a S-UMTS element?

(a) Dual circular polarization.

(b) Integrated with a band-pass filter.

(c) Tx frequency band of 2160-2200 MHz.

(d) High isolation and low mutual coupling.

18. Which of the following statement(s) is/are correct regarding satellite based/space-borne antenna arrays?

(a) Slotted waveguide approach was popular in early days as they enabled fast synthesis and very accurate analysis.

(b) In space-borne systems, antennas with doped dielectrics can be used without any issue due to the fact that they mitigate electrostatic discharge.

(c) Satellite-based cellular systems require a multitude of independent beams that cover separate areas to provide multiple access through frequency re-use.

(d) Diluting the antenna with air can improve the performance in terms of tolerances and losses for ground-based and space-borne arrays.

19. What purpose does the MetOp GRAS serve in the context of Global Navigation Satellite Systems (GNSS)?

(a) It provides real-time sounding of the atmosphere from geostationary orbit.

(b) It mitigates beam overlap level problems in multi-beam systems.

(c) It measures the extra phase delay caused by the atmosphere as the signal is going into occultation.

(d) It introduces undesirable losses at high frequencies.

20. Why would using overlapping sub-arrays of smaller feeds be considered for multi-beam systems?

(a) To create a Y-shaped sparse array.

(b) To form a banana-shaped lobe that will cover the GPS orbits.

(c) To mitigate beam overlap level problems.

(d) To provide real-time sounding of the atmosphere.

21. What characteristic does the envisioned future multi-frequency millimetric radiometer system have?

(a) It integrates low-noise amplifiers (LNAs) with the feeds.

(b) It measures the extra phase delay caused by the atmosphere.

(c) It utilizes overlapping sub-arrays of smaller feeds.

(d) It comprises a rotating Y-shaped sparse array.

10 Quiz A10: C9– "Space Communications", Article 11a "Mobile Positioning Using Wireless Networks" & Article 11b "5G mmWave Positioning for Vehicular Networks"

10.1 C9– "Space Communications"

1. Which of the following characteristic(s) is/are true about high/low frequencies in data downlinks?

   (a) Low frequency: Small antennas, high TX power possible, wide bands.

   (b) Low frequency: Large antennas, high TX power possible, low RX noise.

   (c) High frequency: Large attenuation, difficult to generate high power, wide bands.

   (d) High frequency: Small attenuation, high TX power possible, wide bands.

2. Which of the following is/are requirement(s) for Earth observation satellites in low earth orbits?

   (a) Low Angular rate for the ground station.

   (b) Large coverage and long connection time.

   (c) High angular rate for ground station.

   (d) Small coverage area and short connection time.

3. What was a major feature difference of James Webb Space Telescope (JWST), compared to Hubble telescope?

   (a) Ability to take colored photos.

   (b) High ability to cover the infra-red range.

   (c) High ability to cover UV range.

   (d) Shooting lasers against aliens.

4. What is/are implied in a scenario that says the geostationary orbit is crowded?

   (a) It is crowded in terms of distances, indicating that objects are closely spaced in the orbit.

   (b) The GEO belt is crowded with litter and objects that are in the orbits, posing a risk of collisions.

   (c) It is crowded in terms of frequency allocations.

   (d) All of the above

5. Considering a deep space communication scenario (> 2 million km), which of the following statement(s) is/are correct?

(a) The data rate is high due to the large distance.

(b) Large ground station antennas are required for effective communication.

(c) The angular rate for the ground station is high.

(d) The coverage area is large and the connection time is long.

6. What is/are different in space compared to ground-based communications?

(a) Only line-of-sight.

(b) Shorter distances.

(c) Easier to generate RF-power.

(d) Provides global coverage.

7. Which of these statement(s) is/are correct regarding Polar Orbits?

(a) Satellites for Earth observation often have an orbit that passes over the poles.

(b) Sun synchronous orbits pass over the equator at the same local time each orbit.

(c) These satellites make accurate weather forecasts possible.

(d) Two satellites are kept stationary at each pole.

10.2 Article 11a "Mobile Positioning Using Wireless Networks" & Article 11b "5G mmWave Positioning for Vehicular Networks"

8. Which of the following statement(s) is/are true regarding positioning using wireless networks?

(a) Okumura-Hata model depends only on the relative distance between the mobile station and the known base station.

(b) Non-line-of-sight (NLOS), causes all measurements including, time of arrival (ToA) measurements to become unreliable and thus need to be countered using a robust error distribution.

(c) Time of arrival based positioning does not rely on time synchronization.

(d) Using directionally sensitive antennas, angle of arrival (AOA) information can be obtained.

9. What information can a digital map conducted using a graphical information systems dedicated to network planning, such as TEMS CellPlanner Universa contain?

(a) RSS measurements (predicted or provided from dedicated measurement scans).

(b) TOA measurements (from base stations).

(c) True terrain data.

(d) Realistic base station locations.

10. Which of the following is/are used as reference point(s) in mobile centric positioning?

(a) Position of radio base stations.

(b) Magnetic north.

(c) Nearest space observatory.

(d) Position of satellites.

11. What are the main feature(s) of 5G, which enhances positioning in vehicular networks?

(a) Network densification.

(b) Large bandwidths in 5G signal which results finer delay resolution.

(c) High data rate.

(d) Availability of large number of antennas.

12. Which of the following statement(s) is/are correct regarding 5G positioning for vehicular networks?

(a) Sub 3 GHz signals will also be a part of 5G and thus can give a fallback positioning solution when mmWave signals are unavailable.

(b) The large bandwidth in 5G improves the accuracy of time-of-arrival estimations.

(c) Cooperative positioning allows relative positioning only in the presence of reference stations.

(d) All of the above.

13. How does D2D communication benefit positioning in 5G networks?

(a) Improved coverage and accuracy through cooperative positioning.

(b) Enhanced beamforming capabilities.

(c) Higher antenna gains.

(d) All of the above.

11 Quiz A11: C10 – "5G/6G Radio Localization Basics", Article 13 - "Spectrum Management"

11.1 C10– "5G/6G Radio Localization Basics"

1. Which of the following is/are correct about the type(s) of localization?
   (a) In direct localization, we can infer the position directly but with some information loss.
   (b) In layered localization, we can infer the position directly and without information loss.
   (c) Direct localization has no information loss, but is complex.
   (d) Layered localization is less accurate, but is practical.

2. What is/are some challenge(s) when measuring Time Difference of Arrival (TDOA)?
   (a) Performance depends on the choice of reference base station.
   (b) You need to run to the UE quickly in order to measure.
   (c) Requires tight synchronization among base stations.
   (d) It requires a central processing unit.

3. Which of the below is/are existing Radio-based Localization System(s)?
   (a) Equivalent Fisher Information Matrix (EFIM).
   (b) GLONASS.
   (c) Global navigation satellite system (GNSS).
   (d) Beidou.

4. In the context of near-field localization and sensing, which of the following statement(s) is/are true?
   (a) The rule of thumb always works for all estimation models.
   (b) Delay resolution is inversely proportional to the bandwidth.
   (c) Angular resolution is given by the ratio of wavelength to physical array size.
   (d) In a complicated environment (rich-scattering, non-resolvable), the performance of the rule of thumb improves.

5. What is/are advantage(s) with 5G/6G radio localization?
   (a) Larger bandwidth.
   (b) Smaller bandwidth.
   (c) Less directive antennas.
   (d) More directive antennas.

6. For which of the following case(s), Near field Localization and sensing work(s) best?
   (a) Non-geometrical models.
   (b) Non-Linear phase change.
   (c) Simple estimation models.
   (d) Complicated environments.

11.2 Article 13 - "Spectrum Management"

7. Which of the following statement(s) is/are true?
   (a) WLAN has been operating successfully without evident cases of spectrum pollution.
   (b) Fragmented spectrum will require devices to handle more interference scenarios.
   (c) The downside of spectrum commons approach is imminent congestion and spectrum pollution due to increasing number of users.
   (d) Fragmented spectrum calls for aggregation of narrow frequency bands taken out of a wide cumulative bandwidth.

8. Identify the correct statement(s) from the below regarding spectrum management.
   (a) Spectrum rights should be technology specific at local levels.
   (b) According to the trading model of spectrum management, spectrum can be considered as a good which can be sold in a secondary market.
   (c) According to the trading model of spectrum management, operators can apply to use the spectrum with a certain proposal and if there are more applicants than the available rights, it is referred to as a beauty contest to obtain rights.
   (d) Market laws are solely enough for radio regulatory work.

9. What has been a significant recent driver towards improved spectrum utilization and increased demand for more spectrum?
   (a) Radio broadcasting.
   (b) Satellite communication.
   (c) Mobile data traffic.
   (d) Television broadcasting.

10. What are the three levels of spectrum management?

(a) Global, regional, and local.

(b) Global, regional, and national.

(c) International, regional, and national.

(d) International, regional, and local.

11. Which model allows national regulatory authorities to decide in detail to whom to give rights to use the spectrum, for how long, and for what purpose?

(a) Administrative model.

(b) Trading model.

(c) Free model.

(d) Spectrum allocation model.

12 Quiz A12: Article 15 - "Slicing in 5G Transport Networks"

12.1 Article 15 -"Slicing in 5G Transport Networks"

1. Which of the following statements is/are true about transport network slicing?
   (a) Some splits are designed to withstand long delays while the others time critical.
   (b) Space Division Multiplexing (SDM) techniques can help to increase the capacity of fronthaul traffic.
   (c) Time-Sensitive Networking (TSN) working group intends to introduce a solution for carrying high and low priority traffic together, with no need for time synchronization.
   (d) Radio splits do not depend on the interference.

2. Identify the correct statement(s) from the below regarding resource allocation strategies.
   (a) Slice resource allocation should be based on the peak service requirements of the users in order to guarantee optimum service acceptance levels.
   (b) Slice adaption increases the network load although resource utilization is maximized.
   (c) Virtual Network Embedding helps to optimally place network functions.
   (d) To identify the solutions to slice resource mapping problems, game theory can be used.

3. Which of the below statement(s) is/are true regarding slice management and orchestration?
   (a) An appropriate set of data must be selected and sent to the orchestration layer in order to solve the slice admission and mapping problems optimally.
   (b) An appropriate set of data must be selected and sent to the orchestration layer in order to be able to continuously monitor the Service Level Agreements (SLA)s during the slice lifecycle.
   (c) In general, slices span across multiple administrative domains.
   (d) b & c only.

4. Which of the below statement(s) is/are true regarding machine learning and optical network security?

(a) Supervised learning is mostly useful in cases where it is **NOT** easy to provide a representative and precise set of correctly labeled data for a continuously evolving attack landscape.

(b) In physical layer attacks, machine learning techniques are useful in identifying intricate patterns among different parameters.

(c) In general, in-band and out-of-band attacks insert harmful signals generated by a continuous wave laser into a breached fiber.

(d) All of the above.

5. Which of the following statement(s) is/are true regarding security and vulnarabilities of network infrastructure?

(a) Transport network slices do not get affected by physical layer attacks.

(b) Polarization modulation attacks in fibers induce demultiplexing errors.

(c) Meta data can be used to induce faults or tamper with the system cache.

(d) In network virtualization and softwarization, the separation of the control and the data plane can expose the network to potential attacks.

13 Quiz A13: C11 – "Spectrum Management", C11' - "Presentation Skills", C12 - 'Network Slicing', Article 18 - "Wireless Security"

13.1 C11 – "Spectrum Management"

1. Which of the following is/are part(s) of the 6G perspective future goals for spectrum usage?

   (a) Reduce licensing costs.

   (b) Provide indoor coverage.

   (c) Support mobility.

   (d) Provide additional capacity.

2. Which of the following statement(s) about cognitive radio and spectrum management is/are true?

   (a) Cognitive radio systems can dynamically and autonomously adjust their operational parameters.

   (b) Spectrum management occurs on global, regional, and national levels.

   (c) AI and machine learning are not applicable in the context of cognitive radio.

   (d) Spectrum commons require individual licenses for each device operating within them.

3. Which channel number(s) for mobile bands is/are correctly given below?

   (a) 2G and UARFCN.

   (b) 2G and ARFCN.

   (c) 4G and NR-ARFCN.

   (d) 5G and NR-ARFCN.

4. Which organization is responsible for managing the international radio-frequency spectrum and satellite orbit resources?

   (a) ITU-R.

   (b) CEPT.

   (c) Ofcom.

   (d) FCC.

5. What is/are the level(s) at which Network sharing can be done?
   (a) Site sharing.
   (b) RAN sharing.
   (c) Memory Sharing.
   (d) Shared Core.

6. On what level(s) is/are the spectrum managed today?
   (a) Global level.
   (b) Regional level.
   (c) National level.
   (d) All of the above.

13.2 C11' – "Presentation Skills"

7. Which of the following is/are true regarding the use of presentation visuals?
   (a) They increase the audience's retention of information.
   (b) Some figures are self-explanatory, so they don't need to be motivated.
   (c) The size of text and figures needs to be considered.
   (d) All of the above.

8. Which of the following is/are effective strategy/ies for delivering a group presentation?
   (a) The first speaker should introduce everyone in the group, including himself.
   (b) Each group member should know how the person before them will finish their portion of the presentation to ensure smooth hand-offs.
   (c) It is acceptable for group members to use different slide formats and fonts to showcase their individual styles.
   (d) The final speaker should conclude the entire presentation.

9. Which feature(s) do(es) exist(s) in John B. Bigg's Observed Learning outcomes (SOLO) Taxonomy?
   (a) Multi-structural.
   (b) Uni-structural.
   (c) Relational.
   (d) Extended abstract.

10. Which of the following need(s) to be maintained consistent by the presenters in a group?

(a) Color Scheme, font choice, backgrounds.

(b) Amount of text per slides.

(c) Citation Sources.

(d) Amount of time per presenter.

11. Which of the below is/are building block(s) of a presentation?

(a) Opening, background, main body and conclusion.

(b) Opening, main body and keywords.

(c) Background, main body and keywords.

(d) None of the above.

13.3 C12 - "Network Slicing"

12. Which of the following is/are true regarding MQTT?

(a) The entities involved are Publisher, Broker, Subscriber.

(b) The protocol runs over UDP.

(c) It is a Client Server publish/subscribe messaging protocol.

(d) All of the above.

13. Which of the following is/are true about Network Slicing?

(a) Network slicing allows provisioning of several slices over different 5G infrastructures.

(b) Different use cases can be mapped to the same Network Slice Type.

(c) A network slicer is required for the management and operation of slices and virtual functions.

(d) We need a new network slice for each domain, e.g., Radio,transport, cloud.

14. Which of the following technologies enable(s) the implementation of network slicing in modern telecommunication networks?

(a) Network Function Virtualization (NFV).

(b) Software Defined Networking (SDN).

(c) Dynamic Host Configuration Protocol (DHCP).

(d) Simple Network Management Protocol (SNMP).

15. Which of these statement(s) is/are correct regarding network slices?

(a) It is an end-to-end logical network that runs on a shared physical infrastructure.

(b) A slice should be programmable

(c) A slice should be adaptive.

(d) It is an end-to-end physical network that runs on a shared physical infrastructure.

13.4 Article 18 - Wireless Security

16. Which of the following statement(s) is/are true about security issues in wireless networks?

(a) Jamming and Tampering in wireless sensor networks can be classified as physical layer attacks.

(b) WIMAX is not vulnerable to jamming and scrambling due to its IEEE 802.16 protocol stack organization.

(c) Bluejacking, Bluesnarfing and Bluebugging are common attacks in bluetooth networks.

(d) Wireless sensor networks are vulnerable to Sybil attacks in the Transport layer.

17. Identify the correct statement(s) about security in 4G and 5G networks?

(a) 4G is supposed to operate entirely on the IP architecture and suite of protocols, which increases the security concerns.

(b) An attack which inserts messages during discontinuous reception (DRX) period or by using fake buffer status is known as Bandwidth stealing in LTE.

(c) The security mechanisms in 5G for user identity and confidentiality is vastly different from 4G, and thus they protect users against active attacks.

(d) LTE uses cryptography to protect against modifying or injecting user traffic.

18. Which of the following statement(s) is/are true about security in mobile communication technologies?

(a) In 3G, an attack causing damage by modifying system resources is called Interception.

(b) In 2G, none of the security algorithms used by GSM is available to the public.

(c) 5G will be using cloud computing and virtualization in order to optimize the service, thereby rising a new level of security concerns.

(d) In LTE, the Media *Access (MAC) layer issues* include location tracking, bandwidth stealing, DoS attacks and security issues due to open architecture.

19. Which of the following is/are true about the security concerns of Wireless Mesh Networks (WMNs)?

(a) WMNs are vulnarable to DoS attacks performed at different layers.

(b) Lack of physical protection of the mesh stations leads to compromised mesh stations.

(c) WMNs are single hop networks, and thus are safe from security threats related to routing.

(d) In wormhole attacks, the attackers modify the routing settings such that they can initiate a number of DoS attacks later on.

20. Which of the following attacks can be found in WLAN and WiMAX networks?

(a) Message Replay attack in WiMAX only.

(b) DoS attack in WLAN only.

(c) Both Message Replay attack in WiMAX and DoS attack in WLAN.

(d) Neither Message Replay attack in WiMAX nor DoS attack in WLAN.

21. Which of the following security issues is/are related to the physical layer in WiMAX networks?

(a) Jamming, Scrambling, and Water torture attacks.

(b) Man-in-the-middle attacks and Identity theft.

(c) Rogue Base Station attack.

(d) Parallel session, reflection, and interleaving attacks.

22. Which of the following attacks is/are associated with RFID networks?

(a) Unauthorized access only.

(b) Illicit tracking only.

(c) Both Unauthorized access and Illicit tracking.

(d) Neither Unauthorized access nor Illicit tracking.