

Table 1 – Retrieval from Glossary

ID	Query	Expected answer	Use full sentence	Use defined word	Use definition	Observations
1.	Explain EIRP	effective isotropic radiated power (EIRP): The equivalent power of a transmitted signal in terms of an isotropic (omnidirectional) radiator. The EIRP equals the product of the transmitter power and the antenna gain (reduced by any coupling losses between the transmitter and antenna).	Effective isotropic radiated power (EIRP): The equivalent power of a transmitted signal in terms of an isotropic (omnidirectional) radiator. The EIRP equals the product of the transmitter power and the antenna gain (reduced by any coupling losses between the transmitter and antenna). (0.614)	Effective isotropic radiated power (EIRP): The equivalent power of a transmitted signal in terms of an isotropic (omnidirectional) radiator. The EIRP equals the product of the transmitter power and the antenna gain (reduced by any coupling losses between the transmitter and antenna) (0.478)	Effective isotropic radiated power (EIRP): The equivalent power of a transmitted signal in terms of an isotropic (omnidirectional) radiator. The EIRP equals the product of the transmitter power and the antenna gain (reduced by any coupling losses between the transmitter and antenna) (0.669)	The retriever obtains the correct definition by all 3. Also keyword at beginning of sentence is picked up with high similarity in full sentence mode.
			Emergency alert system (EAS): A U.S. national public warning system. (0.372)	Emergency alert system (EAS): A U.S. national public warning system. (0.337)	IEEE 802.1X authentication', ' Extensible Authentication Protocol (EAP) authentication transported by the IEEE 802.1X protocol. (0.360)	
			Received channel power indicator (RCPI): An indication of the total channel power (signal, noise, and interference) of a received frame measured on the channel and at the antenna connector used to receive the frame. (0.362)	Extended service area (ESA): The area within which members of an extended service set (ESS) can communicate. An ESA is larger than or equal to a basic service area (BSA) and might involve several basic service sets (BSSs) in overlapping, disjointed, or both configurations. (0.322)	Master session key (MSK): Keying material that is derived between the Extensible Authentication Protocol (EAP) peer and exported by the EAP method to the Authentication Server (AS) (0.291)	
2	Why do we need a beam steering matrix	beamforming steering matrix: A matrix determined using knowledge of the channel between a transmitter and an intended receiver that maps from space-time streams to transmit antennas with the goal of improving the signal power or	beamformee: A station (STA) that receives a physical layer (PHY) protocol data unit (PPDU) that was transmitted using a beamforming steering matrix. (0.626)	beamforming: A spatial filtering mechanism used at a transmitter to improve the received signal power or signal-to-noise ratio (SNR) at an intended receiver. Syn beam steering. (0.745)	beamformer: A station (STA) that transmits a physical layer (PHY) protocol data unit (PPDU) using a beamforming steering matrix. (0.426)	the top-1 does not return the correct answer using the defined word. The definition does not return it in top-3. The full definition returns it in 3rd position. However top sim in definition > correct answer in defined word. Similarly wrong 2 answers in the full definition have higher sim than correct answer in full sentence

		<p>signal-to-noise ratio (SNR) at the intended receiver</p>	<p>beamforming: A spatial filtering mechanism used at a transmitter to improve the received signal power or signal-to-noise ratio (SNR) at an intended receiver. Syn beam steering. (0.458)</p>	<p>beamforming steering matrix: A matrix determined using knowledge of the channel between a transmitter and an intended receiver that maps from space-time streams to transmit antennas with the goal of improving the signal power or signal-to-noise ratio (SNR) at the intended receiver. (0.443)</p>	<p>beamforming: A spatial filtering mechanism used at a transmitter to improve the received signal power or signal-to-noise ratio (SNR) at an intended receiver. Syn beam steering. (0.367)</p>	
			<p>beamforming steering matrix: A matrix determined using knowledge of the channel between a transmitter and an intended receiver that maps from space-time streams to transmit antennas with the goal of improving the signal power or signal-to-noise ratio (SNR) at the intended receiver. (0.398)</p>	<p>directed frame: See individually addressed. (0.309)</p>	<p>unknown_definition_18:NOTE These uses include calculation of transmit steering, calculation of recommended modulation and coding scheme (MCS), and calculation of calibration parameters. (0.359)</p>	
3	<p>Which framework supports higher precision traffic under a condition of limited resources</p>	<p>multi-level precedence and preemption (MLPP): A framework used with admission control for the treatment of traffic streams based on precedence, which supports the preemption of an active traffic stream by a higher precedence traffic stream when resources are limited. Preemption is the act of forcibly removing a traffic stream in progress in order to free up resources for another higher precedence traffic stream.</p>	<p>traffic category (TC): A label for medium access control (MAC) service data units (MSDUs) that have a distinct user priority (UP), as viewed by higher layer entities, relative to other MSDUs provided for delivery over the same link. Traffic categories are meaningful only to MAC entities that support quality of service (QoS) within the MAC data service. These MAC entities determine the UP for MSDUs belonging to a particular traffic category using the priority value provided with those MSDUs at the MAC service access point (MAC SAP). (0.456)</p>	<p>traffic classification (TCLAS): The specification of one of several types of matching filter to classify protocol data units (PDUs) or medium access control (MAC) service data units (MSDUs) as belonging to a particular traffic stream (TS). Depending on the type of classification, the filter is applied within the MAC sublayer management entity (MLME), above the MAC, or within the MAC itself. (0.535)</p>	<p>admission control: An algorithm intended to prevent the violation of parameterized service commitments made by the network to admitted flows by controlling the admittance of a new flow into a resource constrained network. (0.405)</p>	<p>Only the definition can extract the correct answer but similarity for the correct answer via definition is lesser than even the 3rd result from the other methods</p>

			<p>traffic specification (TSPEC): The quality-of-service (QoS) characteristics of a data flow to and from a QoS station (STA). (0.437)</p>	<p>traffic specification (TSPEC): The quality-of-service (QoS) characteristics of a data flow to and from a QoS station (STA). (0.489)</p>	<p>multi-level precedence and preemption (MLPP): A framework used with admission control for the treatment of traffic streams based on precedence, which supports the preemption of an active traffic stream by a higher precedence traffic stream when resources are limited. Preemption is the act of forcibly removing a traffic stream in progress in order to free up resources for another higher precedence traffic stream. (0.398)</p>	
			<p>traffic stream (TS): A set of medium access control (MAC) service data units (MSDUs) to be delivered subject to the quality-of-service (QoS) parameter values provided to the MAC in a particular traffic specification (TSPEC). TSs are meaningful only to MAC entities that support QoS within the MAC data service. These MAC entities determine the TSPEC applicable for delivery of MSDUs belonging to a particular TS using the priority parameter provided with those MSDUs at the MAC service access point (MAC SAP). (0.411)</p>	<p>traffic stream (TS): A set of medium access control (MAC) service data units (MSDUs) to be delivered subject to the quality-of-service (QoS) parameter values provided to the MAC in a particular traffic specification (TSPEC). TSs are meaningful only to MAC entities that support QoS within the MAC data service. These MAC entities determine the TSPEC applicable for delivery of MSDUs belonging to a particular TS using the priority parameter provided with those MSDUs at the MAC service access point (MAC SAP). (0.461)</p>	<p>traffic specification (TSPEC): The quality-of-service (QoS) characteristics of a data flow to and from a QoS station (STA). (0.396)</p>	
4.	How is Ethertype protocol discrimination (EPD) identified?	<p>medium access control (MAC) service tuple: The collection of a MAC service data unit (MSDU) along with the associated source address, destination addresses, priority, drop eligibility, service class, optional set of service_access_point_identifiers, and optional indication of</p>	<p>unknown_definition_2: NOTE See IETF RFC 3610. (0.434)</p>	<p>peer-to-peer traffic specification (PTP TSPEC): The quality-of-service (QoS) characteristics of a data flow between non-access point (non-AP) QoS stations (STAs). (0.413)</p>	<p>frame: A unit of data exchanged between peer protocol entities. (0.418)</p>	<p>Unable to identify this despite it being available as a keyword in the actual definition</p>

		<p>whether the supplied MSDU is in Ethertype protocol discrimination (EPD) or logical link control (LLC) protocol discrimination (LPD) format, which are all passed as parameters across the MAC service access point (SAP) and are all except the <code>service_access_point_identifiers</code> delivered across the distribution system between access points (APs), mesh gates, and the portal of an extended service set (ESS).</p>	<p>frame: A unit of data exchanged between peer protocol entities. (0.432)</p>	<p>protocol instance: An execution of a particular protocol that consists of the state of the communicating parties as well as the messages exchanged. (0.380)</p>	<p>unknown_definition_9: NOTE See IETF RFC 4282. (0.407)</p>	
			<p>unknown_definition_9: NOTE See IETF RFC 4282. (0.404)</p>	<p>traffic classification (TCLAS): The specification of one of several types of matching filter to classify protocol data units (PDUs) or medium access control (MAC) service data units (MSDUs) as belonging to a particular traffic stream (TS). Depending on the type of classification, the filter is applied within the MAC sublayer management entity (MLME), above the MAC, or within the MAC itself. (0.370)</p>	<p>traffic classification (TCLAS): The specification of one of several types of matching filter to classify protocol data units (PDUs) or medium access control (MAC) service data units (MSDUs) as belonging to a particular traffic stream (TS). Depending on the type of classification, the filter is applied within the MAC sublayer management entity (MLME), above the MAC, or within the MAC itself. (0.383)</p>	
5	What does GAS stand for?	<p>registered location query protocol (RLQP): The query protocol for registered location information that is received and transported by generic advertisement service (GAS) Public Action frames.</p>	<p>unknown_definition_1:NOTE See IETF RFC 2903 [B35]. (0.384)</p>	<p>unknown_definition_8: NOTE IEEE Std 802.11 supports only downlink (DL) MU-MIMO. See downlink multi-user multiple input, multiple output (DL-MU-MIMO) (in 3.2). (0.343)</p>	<p>distribution system medium (DSM): The medium or set of media used by a distribution system (DS) for communications between access points (APs), mesh gates, and the portal of an extended service set (ESS). (0.357)</p>	<p>Unable to identify this despite it being available as a keyword in the actual definition</p>
			<p>unknown_definition_2:NOTE See IETF RFC 3610. (0.376)</p>	<p>unknown_definition_13: NOTE For the purposes of this Standard, there is at most one portal in a given extended service set@s (ESS@s) infrastructure. In an implementation, a single logical portal function may be provided by multiple devices that provide integration services for the ESS. How such</p>	<p>service hash: A value used for representing a service. This value is formed from a hash of the service name. (0.322)</p>	

				multiple devices coordinate to appear as a single logical portal is implementation dependent. (0.337)		
			unknown_definition_9:NOTE See IETF RFC 4282. (0.370)	unknown_definition_18: NOTE These uses include calculation of transmit steering, calculation of recommended modulation and coding scheme (MCS), and calculation of calibration parameters. (0.334)	subscription service provider (SSP): An organization (operator) offering connection to network services, perhaps for a fee. (0.304)	
6	What is derived between EAP peer	master session key (MSK): Keying material that is derived between the Extensible Authentication Protocol (EAP) peer and exported by the EAP method to the Authentication Server (AS).	IEEE 802.1X authentication: Extensible Authentication Protocol (EAP) authentication transported by the IEEE 802.1X protocol. (0.491)	peer mesh station (STA): A mesh STA to which a mesh peering has been established. (0.460)	frame: A unit of data exchanged between peer protocol entities. (0.625)	The keyword is relatively at the beginning of the sentence and is therefore picked up wherever available (it is not available in the defined word)
			master session key (MSK): Keying material that is derived between the Extensible Authentication Protocol (EAP) peer and exported by the EAP method to the Authentication Server (AS). (0.434)	peer-to-peer link: A direct link within a quality-of-service (QoS) basic service set (BSS), a tunneled direct-link setup (TDLS) link, or a station-to-station (STA-to-STA) communication in an independent basic service set (IBSS). (0.401)	IEEE 802.1X authentication: Extensible Authentication Protocol (EAP) authentication transported by the IEEE 802.1X protocol. (0.476)	
			peer-to-peer traffic specification (PTP TSPEC): The quality-of-service (QoS) characteristics of a data flow between non-access point (non-AP) QoS stations (STAs). (0.410)	peer-to-peer traffic specification (PTP TSPEC): The quality-of-service (QoS) characteristics of a data flow between non-access point (non-AP) QoS stations (STAs). (0.373)	master session key (MSK): Keying material that is derived between the Extensible Authentication Protocol (EAP) peer and exported by the EAP method to the Authentication Server (AS). (0.451)	

Table 2 – Retrieval from full document

Query ID	Query	Expected answer	Search for paragraph	Search by sentence retrieve paragraph	Observations
F1	What do the values of RAW Group Indication subfield in RPS element indicate?	<p>The RAW Group Indication subfield indicates whether the RAW Group subfield is present in the RAW Assignment subfield and is interpreted as follows:</p> <ul style="list-style-type: none"> — When the RAW type is generic RAW, sounding RAW, or triggering frame RAW, the RAW Group Indication subfield indicates whether the RAW group defined in the current RAW assignment is the same RAW group as defined in the previous RAW assignment. When the RAW Group Indication subfield is equal to 0, the RAW group defined in the current RAW assignment is the same as the RAW group defined in the previous RAW assignment and the RAW Group subfield is not present in this RAW assignment. When the RAW Group Indication subfield is equal to 1, the RAW Group subfield is present in this RAW assignment. The RAW Group Indication subfield in the first RAW assignment is set to 0 to indicate the RAW group in the first RAW assignment is the same as the range of AIDs in all the TIM bitmaps in the S1G Beacon frame. — When the RAW is a non-TIM RAW, the RAW Group Indication subfield is set to 0 and the RAW Group subfield is not present. — When the RAW is an AP PM RAW, the RAW Group Indication subfield equal to 0 indicates that the RAW group does not include any of the non-AP STAs, and the RAW Group subfield is not present. When the RAW Group Indication subfield is equal to 1, the RAW Group subfield is present. 	<p>The format of the RAW Group subfield is shown in Figure 9-672</p> <p>When the RAW is an AP PM RAW, the RAW Group Indication subfield equal to 0 indicates that the RAW group does not include any of the non-AP STAs, and the RAW Group subfield is not present. When the RAW Group Indication subfield is equal to 1, the RAW Group subfield is present.</p> <p>The RAW Group Indication subfield indicates whether the RAW Group subfield is present in the RAW Assignment subfield and is interpreted as follows:</p>	<p>When the RAW is an AP PM RAW, the RAW Group Indication subfield equal to 0 indicates that the RAW group does not include any of the non-AP STAs, and the RAW Group subfield is not present. When the RAW Group Indication subfield is equal to 1, the RAW Group subfield is present.</p> <p>The RAW Group Indication subfield indicates whether the RAW Group subfield is present in the RAW Assignment subfield and is interpreted as follows:</p> <p>When the RAW type is generic RAW, sounding RAW, or triggering frame RAW, the RAW Group Indication subfield indicates whether the RAW group defined in the current RAW assignment is the same RAW group as defined in the previous RAW assignment. When the RAW Group Indication subfield is equal to 0, the RAW group defined in the current RAW assignment is the same as the RAW group defined in the previous RAW assignment and the RAW Group subfield is not present in this RAW assignment. When the RAW Group Indication subfield is equal to 1, the RAW Group subfield is present in this RAW assignment. The RAW Group Indication subfield in the first RAW assignment is set to 0 to indicate the RAW group in the first RAW assignment is the same as the range of AIDs in all the TIM bitmaps in the S1G Beacon frame.</p>	<p>It is clear that similarity search at sentence level and retrieval at paragraph level gives significantly better results. Since we retrieve 3 distinct paragraphs there is far more context available at the generator create good responses</p>

Table 3 – Generator Performance

Query ID	Query	Expected answer	Generated response – similarity by paragraph	Generated Response – similarity by sentence, retrieve paragraph	Observations
F1	What do the values of RAW Group Indication subfield in RPS element indicate?	<p>The RAW Group Indication subfield indicates whether the RAW Group subfield is present in the RAW Assignment subfield and is interpreted as follows:</p> <ul style="list-style-type: none"> — When the RAW type is generic RAW, sounding RAW, or triggering frame RAW, the RAW Group Indication subfield indicates whether the RAW group defined in the current RAW assignment is the same RAW group as defined in the previous RAW assignment. When the RAW Group Indication subfield is equal to 0, the RAW group defined in the current RAW assignment is the same as the RAW group defined in the previous RAW assignment and the RAW Group subfield is not present in this RAW assignment. When the RAW Group Indication subfield is equal to 1, the RAW Group subfield is present in this RAW assignment. The RAW Group Indication subfield in the first RAW assignment is set to 0 to indicate the RAW group in the first RAW assignment is the same as the range of AIDs in all the TIM bitmaps in the S1G Beacon frame. — When the RAW is a non-TIM RAW, the RAW Group Indication subfield is set to 0 and the RAW Group subfield is not present. — When the RAW is an AP PM RAW, the RAW Group Indication subfield equal to 0 indicates that the RAW group does not include any of the non-AP STAs, and the RAW Group subfield is not present. <p>When the RAW Group Indication subfield is equal to 1, the RAW Group subfield is present.</p>	<p>'According to the given paragraphs, the values of the RAW Group Indication subfield in the RPS (Radio Parameter Set) element indicate whether the RAW Group subfield is present or not in the RAW Assignment subfield.</p>	<p>According to the given paragraphs, the values of the RAW Group Indication subfield in the RPS (Radio Path Selection) element indicate whether the RAW Group subfield is present in the RAW Assignment subfield. If the value of RAW Group Indication subfield is equal to 0, it means that the RAW group defined in the current RAW assignment is the same as the RAW group defined in the previous RAW assignment, and the RAW Group subfield is not present in this RAW assignment. If the value of RAW Group Indication subfield is equal to 1, it means that the RAW Group subfield is present in this RAW assignment</p>	<p>A much broader context in general being available for the LLM because of multiple retrieved paragraphs helps it in create good long form question answering.</p>
F2	What is IGTK	<p>integrity group temporal key (IGTK): A random value, assigned by the broadcast/multicast source station (STA), which is used to protect group addressed medium access control (MAC) management protocol data units (MMPDUs) from that source STA.</p>	<p>Sure! Based on the given paragraphs, the answer to your question is:\n\nIGTK stands for "integrity group temporal key"</p>	<p>According to the given paragraphs, the answer to question 1 is: IGTK stands for "integrity group temporal key"</p>	<p>Very often the generated response is a trivial answer giving the full form of an abbreviated technical term but not giving it's definition</p>
F3	What is idle power indicator	<p>idle power indicator (IPI): A physical layer (PHY) indication of the total channel power (noise and interference) as measured in the channel at the receiving antenna connector while the station (STA) is idle, i.e., neither transmitting nor receiving a frame.</p>	<p>IPI - idle power indicator</p>	<p>IPI - idle power indicator</p>	<p>Very often a term is just abbreviated in a response. This can sometimes be reduced if a user a question like "Define Idle Power Indicator" but since this is left to the user can create issues</p>

Table 4 : Battery Standards Terminology

ID	Query	Expected Answer	Use Full Sentence	Use Defined Word	Use Definition	Observations
B1	What is ampere-hour rating	The capacity assigned to a cell by its manufacturer for a given constant-current discharge, at a specified electrolyte temperature, to a given end-of-discharge voltage, for a specified duration.	<p>ampere-hour rating: The capacity assigned to a cell by its manufacturer for a given constant-current discharge, at a specified electrolyte temperature, to a given end-of-discharge voltage, for a specified duration. 0.966</p> <p>charge ampere-hours (Ah) to load Ah ratio (C:L) The total available charge ampere-hours (Ah) divided by the load Ah. 0.641</p> <p>watt-hour capacity: See battery capacity. watt-hour density See energy density. watt-hour efficiency See energy efficiency. 0.579</p>	<p>ampere-hour rating: The capacity assigned to a cell by its manufacturer for a given constant-current discharge, at a specified electrolyte temperature, to a given end-of-discharge voltage, for a specified duration. 0.82</p> <p>charge ampere-hours (Ah) to load Ah ratio (C:L) The total available charge ampere-hours (Ah) divided by the load Ah. 0.608</p> <p>n-hour rate: The rated current for an n-hour discharge. 0.601</p>	<p>charge ampere-hours (Ah) to load Ah ratio (C:L) The total available charge ampere-hours (Ah) divided by the load Ah. 0.649</p> <p>C-rate: A current that is numerically equivalent to the rated ampere-hour capacity. See also n-hour rate. 0.625</p> <p>n-hour rate: The rated current for an n-hour discharge. 0.613</p>	They presence of the keyword in the beginning gives accurate retrieval.
B2	Why do we need an expander	Expander is added to the active material of an electrode to maintain its porosity. (Context: equalizing voltage: The voltage at which an equalizing charge is performed. See also equalizing charge. expander A substance added to the active material of an electrode to maintain its porosity.)	<p>available energy: The total watt-hours that can be withdrawn from a cell based upon a specific set of operating conditions (including initial state of charge, discharge rate, initial cell temperature, and end voltage) and the state of health of the cell. 0.23</p> <p>electrolyte pumping: The release of electrolyte through the electrolyte withdrawal tubes due to pressure differential. 0.226</p> <p>energy efficiency: The ratio of the energy output on discharge to the energy input required to charge a cell or battery to the same state of charge at which the discharge began. 0.223</p>	<p>aging margin: An allowance to compensate for loss of capacity over time. 0.432</p> <p>unknown_definition_44:NOTE—This term is normally applied to containers to optimize footprint. 0.35</p> <p>equalizing voltage: The voltage at which an equalizing charge is performed. See also equalizing charge. expander A substance added to the active material of an electrode to maintain its porosity. 0.312</p>	<p>unknown_definition_8:NOTE—Use this term in place of actual capacity. 0.293</p> <p>unknown_definition_44:NOTE—This term is normally applied to containers to optimize footprint. 0.254</p> <p>unknown_definition_81:NOTE—This is an older term. The term container is preferred. 0.247</p>	Using definition helps, but presence of keyword towards the end yields low similarity score.
B3	What is used to gel the electrolyte in a lithium-ion polymer cell	A polymer additive. (Context: lithium-ion polymer cell: A lithium-ion cell, contained in a soft pouch, in which the electrolyte is gelled using a polymer additive. See also lithium-ion cell.)	<p>gelled-electrolyte cell: A cell in which the electrolyte is immobilized by addition of a gelling agent. See also valve-regulated lead-acid cell; gelled electrolyte. 0.797</p> <p>lithium-ion polymer cell: A lithium-ion cell, contained in a soft pouch, in which the electrolyte is gelled using a polymer additive. See also lithium-ion cell. 0.757</p>	<p>lithium-ion polymer cell: A lithium-ion cell, contained in a soft pouch, in which the electrolyte is gelled using a polymer additive. See also lithium-ion cell. 0.589</p> <p>lithium-metal polymer cell: A cell in which the electrolyte is a conductive solid polymer and the negative</p>	<p>lithium-ion polymer cell: A lithium-ion cell, contained in a soft pouch, in which the electrolyte is gelled using a polymer additive. See also lithium-ion cell. 0.662</p> <p>lithium-metal polymer cell: A cell in which the electrolyte is a conductive solid polymer and</p>	Keyword is present towards the end, though other keywords in the beginning help retrieval with higher score.

			<p>polymer-electrolyte lithium-ion cell: A lithium-ion cell in which the electrolyte is a conductive solid polymer. See also lithium-ion cell; lithium-ion polymer cell; lithium-metal polymer cell. 0.711</p>	<p>electrode is metallic lithium. See also polymer-electrolyte lithium-ion cell. 0.576</p> <p>polymer-electrolyte lithium-ion cell: A lithium-ion cell in which the electrolyte is a conductive solid polymer. See also lithium-ion cell; lithium-ion polymer cell; lithium-metal polymer cell. 0.55</p>	<p>the negative electrode is metallic lithium. See also polymer-electrolyte lithium-ion cell. 0.613</p> <p>polymer-electrolyte lithium-ion cell: A lithium-ion cell in which the electrolyte is a conductive solid polymer. See also lithium-ion cell; lithium-ion polymer cell; lithium-metal polymer cell. 0.598</p>	
B4	Why is maintenance-free battery not defined	<p>This is not an accepted term as all battery systems require periodic inspection and cleaning. (Context: unknown_definition_86:NOTE— This is not an accepted term as all battery systems require periodic inspection and cleaning.)</p>	<p>battery conditioning: A corrective action for restoring a battery to its full capacity. 0.704</p> <p>maintenance-free battery: << deliberately not defined >>. 0.465</p> <p>stationary battery: A battery designed for service in a permanent location. 0.464</p>	<p>unknown_definition_41:NOTE— This term should not be used with rechargeable stationary batteries. 0.567</p> <p>unknown_definition_86:NOTE— This is not an accepted term as all battery systems require periodic inspection and cleaning. 0.565</p> <p>state of health (SOH): A measurement representing the present state of battery available capacity or remaining service life relative to rated capacity or specifications. 0.55</p>	<p>unknown_definition_41:NOTE— This term should not be used with rechargeable stationary batteries. 0.844</p> <p>maintenance-free battery: << deliberately not defined >>. 0.566</p> <p>unknown_definition_86:NOTE— This is not an accepted term as all battery systems require periodic inspection and cleaning. 0.534</p>	<p>Retrieval confidence is not high, part of the question terms are present in the preceding sentence of the document.</p>
B5	What does EDLC stand for	electric double-layer capacitor	<p>electric double-layer capacitor (EDLC): A device that has characteristics of both conventional capacitors and electrochemical cells, storing charge electrostatically at voltages similar to those of secondary cells. 0.501</p> <p>NOTE— There are generally two types of LVD as follows: Low-voltage load disconnect (LVLD) and low-voltage battery disconnect (LVBD). 0.31</p> <p>sodium-metal chloride: A generic name for a family of sodium-based cells using one or more chlorinated metal compounds as the positive electrode material. 0.252</p>	<p>unknown_definition_46:NOTE— EDLCs are commonly known as ultracapacitors, ultracaps, supercaps, or supercapacitors. EDLCs have orders of magnitude more surface area for the same physical size as conventional capacitors, and thus have orders of magnitude greater capacitance values. 0.547</p> <p>NOTE— There are generally two types of LVD as follows: Low-voltage load disconnect (LVLD) and low-voltage battery disconnect (LVBD). 0.247</p> <p>performance test: A constant-current or constant-power discharge capacity test, made on a battery after being in</p>	<p>electric double-layer capacitor (EDLC): A device that has characteristics of both conventional capacitors and electrochemical cells, storing charge electrostatically at voltages similar to those of secondary cells. 0.666</p> <p>unknown_definition_46:NOTE— EDLCs are commonly known as ultracapacitors, ultracaps, supercaps, or supercapacitors. EDLCs have orders of magnitude more surface area for the same physical size as conventional capacitors, and thus have orders of magnitude greater capacitance values.</p>	<p>Acronym is present, though retrieval score is not high.</p>

				service. See also acceptance test; modified performance test. 0.215	0.563 sodium-metal chloride: A generic name for a family of sodium-based cells using one or more chlorinated metal compounds as the positive electrode material. 0.261	
B6	What is the discharge duration for a general-purpose cell	1-3 hours (Context: general-purpose cell: A cell designed for discharges of medium duration (typically 1–3 hours) or duty cycles that include both high-rate discharges and long-duration discharges.)	discharge rate: The rate, in amperes (or watts), at which current (or power) is delivered by a battery. See also hour rate. 0.674 long-duration discharge: Removal of a low to moderate current (i.e., relative to cell size) over a long period of time (normally 3 hours or longer). 0.665 self-discharge rate: The amount of capacity reduction occurring per unit of time in a battery as the result of self-discharge. 0.638	full cycle: A battery discharge where 80% or more of the cell's design capacity is removed followed by a complete recharge. 0.742 general-purpose cell: A cell designed for discharges of medium duration (typically 1–3 hours) or duty cycles that include both high-rate discharges and long-duration discharges. 0.665 n-hour rate: The rated current for an n-hour discharge. 0.579	general-purpose cell: A cell designed for discharges of medium duration (typically 1–3 hours) or duty cycles that include both high-rate discharges and long-duration discharges. 0.794 long-duration discharge: Removal of a low to moderate current (i.e., relative to cell size) over a long period of time (normally 3 hours or longer). 0.725 n-hour rate: The rated current for an n-hour discharge. 0.642	Retrieval scores are close across cases, but keywords are present in the beginning, so context is retrieved.
B7	Which graph describes a cell's discharge characteristics	S-curve (Context: S-curve: A graph that contains a set of curves used to describe a cell's discharge characteristics.)	discharge rate: The rate, in amperes (or watts), at which current (or power) is delivered by a battery. See also hour rate. 0.623 high-rate discharge: Removal of a large current (i.e., relative to cell size) over a short period of time. 0.538 self-discharge rate: The amount of capacity reduction occurring per unit of time in a battery as the result of self-discharge. 0.528	fan curve: A graph that contains a set of curves used to describe a cell's discharge characteristics. See also 0.781 general-purpose cell: A cell designed for discharges of medium duration (typically 1–3 hours) or duty cycles that include both high-rate discharges and long-duration discharges. 0.781 S-curve: A graph that contains a set of curves used to describe a cell's discharge characteristics. See also 0.645	high-rate discharge: Removal of a large current (i.e., relative to cell size) over a short period of time. 0.664 long-duration discharge: Removal of a low to moderate current (i.e., relative to cell size) over a long period of time (normally 3 hours or longer). 0.627 S-curve: A graph that contains a set of curves used to describe a cell's discharge characteristics. See also 0.573	Most keywords are present at the end, retrieval scores are not high.
B8	What is LOI	limiting oxygen index (LOI): The minimum concentration of oxygen in an oxygen/nitrogen mixture, expressed as percentage by volume, that will support candle-	limiting oxygen index (LOI): The minimum concentration of oxygen in an oxygen/nitrogen mixture, expressed as percentage by volume, that will support candle-like combustion of a specified material.	lithium nickel-cobalt-aluminum oxide (NCA): A chemical compound (LiNi _{1-x} Co _y Al _z O ₂) used in the positive electrode of one type of lithium-ion cell. See also lithium-ion cell.	limiting oxygen index (LOI): The minimum concentration of oxygen in an oxygen/nitrogen mixture, expressed as percentage by volume, that will	Result is retrieved but similarity scores are not significantly high.

		like combustion of a specified material.	<p>0.435</p> <p>lithium iron phosphate (LFP): A chemical compound (LiFePO4) used in the positive electrode of one type of lithium-ion cell. See also lithium-ion cell. 0.312</p> <p>NOTE—There are generally two types of LVD as follows: Low-voltage load disconnect (LVLD) and low-voltage battery disconnect (LVBD). 0.304</p>	<p>0.305</p> <p>lithium titanate (LTO): A chemical compound (Li4Ti5O12) used in the negative electrode of one type of lithium-ion cell. See also lithium-ion cell. 0.282</p> <p>NOTE—There are generally two types of LVD as follows: Low-voltage load disconnect (LVLD) and low-voltage battery disconnect (LVBD). 0.274</p>	<p>support candle-like combustion of a specified material. 0.599</p> <p>lithium cobalt oxide (LCO): A chemical compound (LiCoO2) used in the positive electrode of one type of lithium-ion cell. See also lithium-ion cell. 0.32</p> <p>lithium iron phosphate (LFP): A chemical compound (LiFePO4) used in the positive electrode of one type of lithium-ion cell. See also lithium-ion cell. 0.299</p>	
B9	What are the positive and negative electrodes made of in a nickel-cadmium cell	nickel-cadmium (Ni-Cd) cell: A secondary cell in which the active material of the positive electrode is nickel oxyhydroxide, the active material of the negative electrode is cadmium, and the electrolyte is a dilute solution of potassium hydroxide.	<p>nickel-cadmium (Ni-Cd) battery electrolyte: A dilute solution of potassium hydroxide. 0.799</p> <p>nickel-cadmium (Ni-Cd) cell: A secondary cell in which the active material of the positive electrode is nickel oxyhydroxide, the active material of the negative electrode is cadmium, and the electrolyte is a dilute solution of potassium hydroxide. 0.744</p> <p>partially recombinant nickel-cadmium cell: A vented nickel-cadmium cell providing an internal means for the recombination of internally generated oxygen and suppression of hydrogen gas evolution to limit water consumption, typically operating with a recombination efficiency of 90% or higher. 0.708</p>	<p>unknown_definition_96:NOTE—The metal M in the negative electrode of a Ni-MH cell is one of many different intermetallic compounds. 0.689</p> <p>sodium-nickel chloride: A sodium-based cell using nickel chloride as the main material in the positive electrode. 0.685</p> <p>unknown_definition_145:NOTE—Most designs also include iron chloride in the positive so they are technically sodium-nickel-iron chloride cells. 0.648</p>	<p>nickel-cadmium (Ni-Cd) battery electrolyte: A dilute solution of potassium hydroxide. 0.746</p> <p>nickel-cadmium (Ni-Cd) cell: A secondary cell in which the active material of the positive electrode is nickel oxyhydroxide, the active material of the negative electrode is cadmium, and the electrolyte is a dilute solution of potassium hydroxide. 0.693</p> <p>sodium-nickel chloride: A sodium-based cell using nickel chloride as the main material in the positive electrode. 0.643</p>	Result is not retrieved at top index, similarity scores are close.
B10	How is a ripple expressed	ripple: A periodic waveform riding in the dc circuit, normally expressed as peak, peak-to-peak, or root-mean square (rms) voltage or current.	<p>float effect: A lowering of the average discharge voltage of a nickel-cadmium battery following long-term float operation. 0.602</p> <p>ripple: A periodic waveform riding in the dc circuit, normally expressed as peak, peak-to-peak, or root-mean square (rms) voltage or current. 0.594</p> <p>NOTE—Do not use the term ac ripple. ripple current: See ripple. ripple voltage See ripple.</p>	<p>oxygen-recombination efficiency: The amount of oxygen ultimately converted to water at the negative plates, expressed as a percentage of the total amount of oxygen produced at the positive plates. 0.612</p> <p>ripple: A periodic waveform riding in the dc circuit, normally expressed as peak, peak-to-peak, or root-mean square (rms) voltage or current.</p>	<p>ripple: A periodic waveform riding in the dc circuit, normally expressed as peak, peak-to-peak, or root-mean square (rms) voltage or current. 0.629</p> <p>NOTE—Do not use the term ac ripple. ripple current: See ripple. ripple voltage See ripple. 0.628</p>	Using the definition helped retrieval, though similarity scores are close with next retrieved result.

			0.343	0.327 NOTE—Do not use the term ac ripple. ripple current: See ripple. ripple voltage See ripple. 0.315	series string: See string. 0.275	
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Table 5: Generator Performance (Battery Terminology)

ID	Query	Expected Answer	Use Full Sentence	Use Defined Word	Use Definition
B1	What is ampere-hour rating	The capacity assigned to a cell by its manufacturer for a given constant-current discharge, at a specified electrolyte temperature, to a given end-of-discharge voltage, for a specified duration.	Ampere-hour rating: The capacity assigned to a cell by its manufacturer for a given constant-current discharge, at a specified electrolyte temperature, to a given end-of-discharge voltage, for a specified duration.	Ampere-hour rating: The capacity assigned to a cell by its manufacturer for a given constant-current discharge, at a specified electrolyte temperature, to a given end-of-discharge voltage, for a specified duration.	Ah rating refers to the total available charge ampere-hours (Ah).
B2	Why do we need an expander	Expander is added to the active material of an electrode to maintain its porosity. (Context: equalizing voltage: The voltage at which an equalizing charge is performed. See also equalizing charge. expander A substance added to the active material of an electrode to maintain its porosity.)	To expand a package's contents.	To expand the volume of the electrolyte solution in the cell.	To maintain the porosity of the electrode's active material.
B3	What is used to gel the electrolyte in a lithium-ion polymer cell	A polymer additive. (Context: lithium-ion polymer cell: A lithium-ion cell, contained in a soft pouch, in which the electrolyte is gelled using a polymer additive. See also lithium-ion cell.)	In a lithium-ion polymer cell, the electrolyte is gelled using a polymer additive.	In a lithium-ion polymer cell, the electrolyte is gelled using a polymer additive.	In a lithium-ion polymer cell, the electrolyte is gelled using a polymer additive.
B4	Why is maintenance-free battery not defined	This is not an accepted term as all battery systems require periodic inspection and cleaning. (Context: unknown_definition_86:NOTE— This is not an accepted term as all battery systems require periodic inspection and cleaning.)	Because it requires periodic inspection and cleaning, according to the given passage.	Because it was deliberately left undefined in the passage.	Maintenance-free battery is not defined because it "should not be used with rechargeable stationary batteries."
B5	What does EDLC stand for	electric double-layer capacitor	EDLC stands for Electric Double-Layer Capacitor.	EDLC stands for "electric double-layer capacitor."	EDLC stands for Electrochemical Double Layer Capacitor.

B6	What is the discharge duration for a general-purpose cell	1-3 hours (Context: general-purpose cell: A cell designed for discharges of medium duration (typically 1–3 hours) or duty cycles that include both high-rate discharges and long-duration discharges.)	Medium duration (typically 1–3 hours)	General-purpose cells have a discharge duration of 3 hours or longer.	Medium duration (typically 1–3 hours).
B7	Which graph describes a cell's discharge characteristics	S-curve (Context: S-curve: A graph that contains a set of curves used to describe a cell's discharge characteristics.)	An S-curve	High-rate discharge graph	Fan curve
B8	What is LOI	limiting oxygen index (LOI): The minimum concentration of oxygen in an oxygen/nitrogen mixture, expressed as percentage by volume, that will support candle-like combustion of a specified material.	Limiting Oxygen Index (LOI).	Limiting Oxygen Index (LOI)	LOI stands for Lithium Iron Phosphate.
B9	What are the positive and negative electrodes made of in a nickel-cadmium cell	nickel-cadmium (Ni-Cd) cell: A secondary cell in which the active material of the positive electrode is nickel oxyhydroxide, the active material of the negative electrode is cadmium, and the electrolyte is a dilute solution of potassium hydroxide.	Positive electrode: Nickel oxyhydroxide Negative electrode: Cadmium	Positive electrode: Nickel oxyhydroxide Negative electrode: Cadmium	Positive electrode: Nickel oxide (NiOx) Negative electrode: Cadmium (Cd)
B10	How is a ripple expressed	ripple: A periodic waveform riding in the dc circuit, normally expressed as peak, peak-to-peak, or root-mean square (rms) voltage or current.	Peak, peak-to-peak, or root-mean-square (rms).	Peak-to-peak.	As a peak, peak-to-peak, or root-mean-square (rms) voltage or current.

Table 6 - Retrieval from Glossary (Additional Questions)

ID	Query	Expected Answer	Use Full Sentence	Use Defined Word	Use Definition
7	What are possible TID values	There are 16 possible TID values; eight identify traffic categories (TCs), and the other eight identify parameterized traffic streams (TSs). The TID is assigned to an MSDU in the layers above the MAC.	traffic classification (TCLAS): The specification of one of several types of matching filter to classify protocol data units (PDUs) or medium access control (MAC) service data units (MSDUs) as belonging to a particular traffic stream (TS). Depending on the type of classification, the filter is applied within the MAC sublayer management entity (MLME), above the MAC, or within the MAC itself. 0.528	traffic classification (TCLAS): The specification of one of several types of matching filter to classify protocol data units (PDUs) or medium access control (MAC) service data units (MSDUs) as belonging to a particular traffic stream (TS). Depending on the type of classification, the filter is applied within the MAC sublayer management entity (MLME), above the MAC, or within the MAC itself. 0.626	traffic classification (TCLAS): The specification of one of several types of matching filter to classify protocol data units (PDUs) or medium access control (MAC) service data units (MSDUs) as belonging to a particular traffic stream (TS). Depending on the type of classification, the filter is applied within the MAC sublayer management entity (MLME), above the MAC, or within the MAC itself. 0.507 traffic filter: A set of traffic specifications defined by the use of traffic classification (TCLAS) elements that are utilized by

			<p>unknown_definition_20:NOTE There are 16 possible TID values; eight identify traffic categories (TCs), and the other eight identify parameterized traffic streams (TSs). The TID is assigned to an MSDU in the layers above the MAC. 0.522</p> <p>traffic stream (TS): A set of medium access control (MAC) service data units (MSDUs) to be delivered subject to the quality-of-service (QoS) parameter values provided to the MAC in a particular traffic specification (TSPEC). TSs are meaningful only to MAC entities that support QoS within the MAC data service. These MAC entities determine the TSPEC applicable for delivery of MSDUs belonging to a particular TS using the priority parameter provided with those MSDUs at the MAC service access point (MAC SAP). 0.496</p>	<p>traffic identifier (TID): Any of the identifiers usable by higher layer entities to distinguish medium access control (MAC) service data units (MSDUs) to MAC entities that support quality of service (QoS) within the MAC data service. 0.575</p> <p>traffic stream (TS): A set of medium access control (MAC) service data units (MSDUs) to be delivered subject to the quality-of-service (QoS) parameter values provided to the MAC in a particular traffic specification (TSPEC). TSs are meaningful only to MAC entities that support QoS within the MAC data service. These MAC entities determine the TSPEC applicable for delivery of MSDUs belonging to a particular TS using the priority parameter provided with those MSDUs at the MAC service access point (MAC SAP). 0.542</p>	<p>the traffic filtering service (TFS) to identify specific allowed frames. 0.46</p> <p>unknown_definition_20:NOTE There are 16 possible TID values; eight identify traffic categories (TCs), and the other eight identify parameterized traffic streams (TSs). The TID is assigned to an MSDU in the layers above the MAC. 0.45</p>
8	What checks FILS authentication?	Integrity check key is used to for FILS authentication	<p>authentication: The service used to establish the identity of one station (STA) as a member of the set of STAs authorized to associate with another STA. 0.389</p> <p>Authentication Server (AS): An entity that provides an authentication service to an Authenticator. This service determines, from the credentials provided by the Supplicant, whether the Supplicant is authorized to access the services provided by the Authenticator. (IEEE Std 802.1X-201016) 0.383</p> <p>IEEE 802.1X authentication: Extensible Authentication Protocol (EAP) authentication transported by the IEEE 802.1X protocol. 0.366</p>	<p>authentication: The service used to establish the identity of one station (STA) as a member of the set of STAs authorized to associate with another STA. 0.444</p> <p>Authentication Server (AS): An entity that provides an authentication service to an Authenticator. This service determines, from the credentials provided by the Supplicant, whether the Supplicant is authorized to access the services provided by the Authenticator. (IEEE Std 802.1X-201016) 0.375</p> <p>Authenticator: An entity at one end of a point-to-point local area network (LAN) segment that facilitates authentication of the entity attached to the other end of that link. (IEEE Std 802.1X-2010) 0.369</p>	<p>Authentication Server (AS): An entity that provides an authentication service to an Authenticator. This service determines, from the credentials provided by the Supplicant, whether the Supplicant is authorized to access the services provided by the Authenticator. (IEEE Std 802.1X-201016) 0.419</p> <p>IEEE 802.1X authentication: Extensible Authentication Protocol (EAP) authentication transported by the IEEE 802.1X protocol. 0.383</p> <p>network access identifier (NAI): The user identity submitted by the Supplicant during IEEE 802.1X authentication. 0.368</p>

9	What is difference between MFB requestor and response	MFB requestor that transmits a physical layer (PHY) protocol data unit (PPDU) containing an HT Control field in which the MCS request (MRQ) subfield is equal to 1 while MFB responder transmits a physical layer (PHY) protocol data unit (PPDU) containing an HT Control field with the MFB field containing an MCS index or the value 127 in response to a PPDU containing an HT Control field in which the MCS request (MRQ) subfield is equal to 1	distribution system access function (DSAF): A function within an access point (AP) or mesh gate that uses the medium access control (MAC) service and distribution system service (DSS) to provide access between the distribution system (DS) and the wireless medium (WM). Within a general link (GLK) AP or GLK mesh station (STA), the DSAF also switches GLK traffic to the GLK convergence function and from there to the IEEE 802.1Q bridge port. 0.394 medium access control (MAC) frame: The unit of data exchanged between MAC entities. Syn medium access control (MAC) protocol data unit (MPDU). 0.325 remote request broker (RRB): The component of the station management entity (SME) of an access point (AP) that supports fast basic service set (BSS) transitions over the distribution system (DS). 0.312	distribution system access function (DSAF): A function within an access point (AP) or mesh gate that uses the medium access control (MAC) service and distribution system service (DSS) to provide access between the distribution system (DS) and the wireless medium (WM). Within a general link (GLK) AP or GLK mesh station (STA), the DSAF also switches GLK traffic to the GLK convergence function and from there to the IEEE 802.1Q bridge port. 0.365 medium access control (MAC) service data unit (MSDU): Information that is delivered as a unit between MAC service access points (SAPs). 0.295 remote request broker (RRB): The component of the station management entity (SME) of an access point (AP) that supports fast basic service set (BSS) transitions over the distribution system (DS). 0.295	individually addressed: When applied to a medium access control (MAC) service data unit (MSDU), it is an MSDU with an individual address as the destination address (DA). When applied to a MAC protocol data unit (MPDU), it is an MPDU with an individual address in the Address 1 field. Syn directed, unicast. 0.328 multiple basic service set identifier (BSSID) capability: The capability to advertise information for multiple BSSIDs using a single Beacon or Probe Response frame instead of using multiple Beacon or Probe Response frames, each corresponding to a single BSSID, and the capability to indicate buffered frames for these multiple BSSIDs using a single traffic indication map (TIM) element in a single Beacon or TIM frame. 0.326 traffic identifier (TID): Any of the identifiers usable by higher layer entities to distinguish medium access control (MAC) service data units (MSDUs) to MAC entities that support quality of service (QoS) within the MAC data service. 0.317
10	What is adjacent channel rejection	Adjacent channel rejection refers to the ability of a wireless network to reject signals from neighboring channels and operate only on its intended channel	channel spacing: The difference between the center frequencies of two nonoverlapping and adjacent channels of the radio transmitter. 0.467 clear channel assessment (CCA) function: The logical function in the physical layer (PHY) that determines the current state of use of the wireless medium (WM). 0.388 nonoperating channel: A channel that is not the operating channel of the basic service set (BSS) of which the station (STA) is a member. 0.359	channel spacing: The difference between the center frequencies of two nonoverlapping and adjacent channels of the radio transmitter. 0.516 nonoperating channel: A channel that is not the operating channel of the basic service set (BSS) of which the station (STA) is a member. 0.463 primary channel: The common channel of operation for all stations (STAs) that are members of the basic service set (BSS). For example, in a 20 MHz, 40 MHz, 80 MHz, 160 MHz or 80+80 MHz BSS the primary channel is a primary 20 MHz channel. 0.442	channel spacing: The difference between the center frequencies of two nonoverlapping and adjacent channels of the radio transmitter. 0.429 hidden station (STA): A STA whose transmissions are not detected using carrier sense (CS) by a second STA, but whose transmissions interfere with transmissions from the second STA to a third STA 0.407 multiple input, multiple output (MIMO): A physical layer (PHY) configuration in which both transmitter and receiver use multiple antennas. 0.370
11	Why is nonce used	Nonce is a numerical value, used in cryptographic operations	nonce: A numerical value, used in cryptographic operations associated with a given cryptographic key, that	nonce: A numerical value, used in cryptographic operations associated with a given cryptographic key, that is not to be	unknown_definition_2:NOTE@See IETF RFC 3610. 0.573

		associated with a given cryptographic key, that is not to be reused with that key, including over all reinitializations of the system through all time.	is not to be reused with that key, including over all reinitializations of the system through all time. 0.747 noncontiguous transmission: A transmission that uses nonadjacent frequency segments. 0.371 non-quality-of-service (non-QoS) access point (AP): An AP that does not support the quality-of-service (QoS) facility. 0.332	reused with that key, including over all reinitializations of the system through all time. 0.706 noncontiguous transmission: A transmission that uses nonadjacent frequency segments. 0.265 non-quality-of-service (non-QoS) access point (AP): An AP that does not support the quality-of-service (QoS) facility. 0.231	unknown_definition_9:NOTE@See IETF RFC 4282. 0.262 pseudorandom function (PRF): A function that hashes various inputs to derive a pseudorandom value. In order to ensure liveness of a communication in which a pseudorandom value is used, a nonce is used as one of the inputs to the function. 0.253
12	What is RLQP	RLQP is the query protocol for registered location information that is received and transported by generic advertisement service (GAS) Public Action frames.	registered location query protocol (RLQP): The query protocol for registered location information that is received and transported by generic advertisement service (GAS) Public Action frames. 0.682 registered location secure server (RLSS): An entity that accesses and manages a database that organizes storage of information by geographic location and securely holds the location and some operating parameters of one or more basic service sets (BSSs). 0.372 remote request broker (RRB): The component of the station management entity (SME) of an access point (AP) that supports fast basic service set (BSS) transitions over the distribution system (DS). 0.344	registered location query protocol (RLQP): The query protocol for registered location information that is received and transported by generic advertisement service (GAS) Public Action frames. 0.471 remote request broker (RRB): The component of the station management entity (SME) of an access point (AP) that supports fast basic service set (BSS) transitions over the distribution system (DS). 0.329 subscription service provider (SSP): An organization (operator) offering connection to network services, perhaps for a fee. 0.271	effective isotropic radiated power (EIRP): The equivalent power of a transmitted signal in terms of an isotropic (omnidirectional) radiator. The EIRP equals the product of the transmitter power and the antenna gain (reduced by any coupling losses between the transmitter and antenna). 0.321 quality-of-service (QoS) access point (AP): An AP that supports the QoS facility. 0.301 quality-of-service (QoS) station (STA): A STA that implements the QoS facility. 0.268
13	What is MAC SAP	MAC SAP is the service addressable points for MAC layer	medium access control (MAC) service data unit (MSDU): Information that is delivered as a unit between MAC service access points (SAPs). 0.546 medium access control (MAC) service tuple: The collection of a MAC service data unit (MSDU) along	medium access control (MAC) protocol data unit (MPDU): The unit of data exchanged between two peer MAC entities using the services of the physical layer (PHY). Syn medium access control (MAC) frame. 0.395 medium access control (MAC) service data unit (MSDU): Information that is delivered as	medium access control (MAC) frame: The unit of data exchanged between MAC entities. Syn medium access control (MAC) protocol data unit (MPDU). 0.599 medium access control (MAC) service data unit (MSDU): Information that is delivered as a unit between MAC service access points (SAPs). 0.454

			<p>with the associated source address, destination addresses, priority, drop eligibility, service class, optional set of service_access_point_identifiers, and optional indication of whether the supplied MSDU is in Ethertype protocol discrimination (EPD) or logical link control (LLC) protocol discrimination (LPD) format, which are all passed as parameters across the MAC service access point (SAP) and are all except the service_access_point_identifiers delivered across the distribution system between access points (APs), mesh gates, and the portal of an extended service set (ESS). 0.467</p> <p>multiple medium access control (MAC) station management entity (SME) (MM-SME): Component of station management that manages multiple cooperating stations (STAs). 0.459</p>	<p>a unit between MAC service access points (SAPs). 0.395</p> <p>multiple medium access control (MAC) station management entity (SME) (MM-SME): Component of station management that manages multiple cooperating stations (STAs). 0.369</p>	<p>medium access control (MAC) service tuple: The collection of a MAC service data unit (MSDU) along with the associated source address, destination addresses, priority, drop eligibility, service class, optional set of service_access_point_identifiers, and optional indication of whether the supplied MSDU is in Ethertype protocol discrimination (EPD) or logical link control (LLC) protocol discrimination (LPD) format, which are all passed as parameters across the MAC service access point (SAP) and are all except the service_access_point_identifiers delivered across the distribution system between access points (APs), mesh gates, and the portal of an extended service set (ESS). 0.438</p>
14	What is CMMG	CMMG is China Millimeter Wave Multi Gigabyte Physical Specification	<p>counter mode with cipher-block chaining message authentication code (CCM): A symmetric key block cipher mode providing confidentiality using counter mode (CTR) and data origin authenticity using cipher- block chaining message authentication code (CBC-MAC). 0.429</p> <p>group master key (GMK): An auxiliary key that might be used to derive a group temporal key (GTK). 0.333</p> <p>multiple medium access control (MAC) station management entity (SME) (MM-SME): Component of station management that manages multiple cooperating stations (STAs). 0.333</p>	<p>Gaussian frequency shift keying (GFSK): A modulation scheme in which the data are first filtered by a Gaussian filter in the baseband and then modulated with a simple frequency modulation. 0.307</p> <p>group temporal key (GTK): A random value, assigned by the group source, which is used to protect group addressed medium access control (MAC) protocol data units (MPDUs) from that source. The GTK might be derived from a group master key (GMK). 0.225</p> <p>network allocation vector (NAV): An indicator, maintained by each station (STA), of time periods when transmission onto the wireless medium (WM) is not initiated by the STA regardless of whether the STA's clear channel assessment (CCA) function senses that the WM is busy. 0.223</p>	<p>Gaussian frequency shift keying (GFSK): A modulation scheme in which the data are first filtered by a Gaussian filter in the baseband and then modulated with a simple frequency modulation. 0.307</p> <p>group temporal key (GTK): A random value, assigned by the group source, which is used to protect group addressed medium access control (MAC) protocol data units (MPDUs) from that source. The GTK might be derived from a group master key (GMK). 0.225</p> <p>network allocation vector (NAV): An indicator, maintained by each station (STA), of time periods when transmission onto the wireless medium (WM) is not initiated by the STA regardless of whether the STA's clear channel assessment (CCA) function senses that the WM is busy. 0.223</p>

15	What is ERP in RFC 6696	RFC 6696 uses "ERP" for the abbreviation of EAP reauthentication protocol;	<p>unknown_definition_2:NOTE@See IETF RFC 3610. 0.523</p> <p>unknown_definition_9:NOTE@See IETF RFC 4282. 0.518</p> <p>registered location query protocol (RLQP): The query protocol for registered location information that is received and transported by generic advertisement service (GAS) Public Action frames. 0.473</p>	<p>extended service area (ESA): The area within which members of an extended service set (ESS) can communicate. An ESA is larger than or equal to a basic service area (BSA) and might involve several basic service sets (BSSs) in overlapping, disjointed, or both configurations. 0.411</p> <p>registered location query protocol (RLQP): The query protocol for registered location information that is received and transported by generic advertisement service (GAS) Public Action frames. 0.404</p> <p>remote request broker (RRB): The component of the station management entity (SME) of an access point (AP) that supports fast basic service set (BSS) transitions over the distribution system (DS). 0.367</p>	<p>unknown_definition_2:NOTE@See IETF RFC 3610. 0.523</p> <p>effective isotropic radiated power (EIRP): The equivalent power of a transmitted signal in terms of an isotropic (omnidirectional) radiator. The EIRP equals the product of the transmitter power and the antenna gain (reduced by any coupling losses between the transmitter and antenna). 0.51</p> <p>unknown_definition_9:NOTE@See IETF RFC 4282. 0.456</p>
16	What is difference between HT beamformer and HT beamformee	A HT beamformer is an HT station (STA) that receives an HT physical layer (PHY) protocol data unit (PPDU) that was transmitted using a beamforming steering matrix and that supports a HT transmit beamforming feedback mechanism. Whereas a HT Beamformee is a HT station (STA) that transmits an HT physical layer (PHY) protocol data unit (PPDU) using a beamforming steering matrix.	<p>unknown_definition_5:NOTE@In this standard, this key is at least 64 octets in length. 0.305</p> <p>unknown_definition_7:NOTE@This is traditionally called a message authentication code (MAC), but the acronym MAC is already reserved for another meaning in this standard. 0.181</p> <p>unknown_definition_11:NOTE@The method of distribution of a password to the units in the system is outside the scope of this standard. 0.169</p>	<p>beamformee: A station (STA) that receives a physical layer (PHY) protocol data unit (PPDU) that was transmitted using a beamforming steering matrix. 0.599</p> <p>beamformer: A station (STA) that transmits a physical layer (PHY) protocol data unit (PPDU) using a beamforming steering matrix. 0.597</p> <p>beamforming: A spatial filtering mechanism used at a transmitter to improve the received signal power or signal-to-noise ratio (SNR) at an intended receiver. Syn beam steering. 0.442</p>	<p>beamforming: A spatial filtering mechanism used at a transmitter to improve the received signal power or signal-to-noise ratio (SNR) at an intended receiver. Syn beam steering. 0.266</p> <p>fast session transfer (FST): The transfer of a session from a channel to another channel, in the same or different frequency bands. The term "session" refers to non-physical layer state information kept by a pair of stations (STAs) that communicate directly (i.e., excludes forwarding). 0.26</p> <p>received channel power indicator (RCPI): An indication of the total channel power (signal, noise, and interference) of a received frame measured on the channel and at the antenna connector used to receive the frame. 0.259</p>
17	What is IQMF	IQMF is An individually addressed Management frame that is transmitted using the quality-of-service management frame (QMF) service. It stands for individually addressed quality-of-service management frame	idle power indicator (IPI): A physical layer (PHY) indication of the total channel power (noise and interference) as measured in the channel at the receiving antenna connector while the station (STA) is idle, i.e., neither transmitting nor receiving a frame. 0.343	distribution system access function (DSAF): A function within an access point (AP) or mesh gate that uses the medium access control (MAC) service and distribution system service (DSS) to provide access between the distribution system (DS) and the wireless medium (WM). Within a general link (GLK) AP or GLK mesh station (STA), the DSAF also switches GLK traffic to the GLK convergence	<p>quadrature binary phase shift keying (QBPSK): A binary phase shift keying modulation in which the binary data is mapped onto the imaginary (Q) axis. 0.279</p> <p>quality-of-service (QoS) independent basic service set (IBSS): An IBSS in which one or more of its stations (STAs) support the QoS facility. 0.255</p>

			<p>integrity group temporal key (IGTK): A random value, assigned by the broadcast/multicast source station (STA), which is used to protect group addressed medium access control (MAC) management protocol data units (MMPDUs) from that source STA. 0.327</p> <p>message integrity code (MIC): A value generated by a cryptographic function. If the input data are changed, a new value cannot be correctly computed without knowledge of the cryptographic key(s) used by the cryptographic function. 0.291</p>	<p>function and from there to the IEEE 802.1Q bridge port. 0.287</p> <p>idle power indicator (IPI): A physical layer (PHY) indication of the total channel power (noise and interference) as measured in the channel at the receiving antenna connector while the station (STA) is idle, i.e., neither transmitting nor receiving a frame. 0.262</p> <p>message integrity code (MIC): A value generated by a cryptographic function. If the input data are changed, a new value cannot be correctly computed without knowledge of the cryptographic key(s) used by the cryptographic function. 0.231</p>	<p>traffic identifier (TID): Any of the identifiers usable by higher layer entities to distinguish medium access control (MAC) service data units (MSDUs) to MAC entities that support quality of service (QoS) within the MAC data service. 0.253</p>
18	How are parametrized traffic streams identified?	The last eight TID digits identify parametrized traffic streams	<p>traffic classification (TCLAS): The specification of one of several types of matching filter to classify protocol data units (PDUs) or medium access control (MAC) service data units (MSDUs) as belonging to a particular traffic stream (TS). Depending on the type of classification, the filter is applied within the MAC sublayer management entity (MLME), above the MAC, or within the MAC itself. 0.537</p> <p>unknown_definition_20:NOTE:There are 16 possible TID values; eight identify traffic categories (TCs), and the other eight identify parameterized traffic streams (TSs). The TID is assigned to an MSDU in the layers above the MAC. 0.536</p> <p>traffic stream (TS): A set of medium access control (MAC) service data units (MSDUs) to be delivered subject to the quality-of-service (QoS) parameter values provided to the MAC in a particular traffic specification (TSPEC). TSs are</p>	<p>traffic classification (TCLAS): The specification of one of several types of matching filter to classify protocol data units (PDUs) or medium access control (MAC) service data units (MSDUs) as belonging to a particular traffic stream (TS). Depending on the type of classification, the filter is applied within the MAC sublayer management entity (MLME), above the MAC, or within the MAC itself. 0.647</p> <p>traffic identifier (TID): Any of the identifiers usable by higher layer entities to distinguish medium access control (MAC) service data units (MSDUs) to MAC entities that support quality of service (QoS) within the MAC data service. 0.587</p> <p>traffic stream (TS): A set of medium access control (MAC) service data units (MSDUs) to be delivered subject to the quality-of-service (QoS) parameter values provided to the MAC in a particular traffic specification (TSPEC). TSs are meaningful only to MAC entities that support QoS within the MAC data service. These MAC entities determine the TSPEC applicable for delivery of MSDUs belonging to a particular TS using the priority parameter</p>	<p>traffic classification (TCLAS): The specification of one of several types of matching filter to classify protocol data units (PDUs) or medium access control (MAC) service data units (MSDUs) as belonging to a particular traffic stream (TS). Depending on the type of classification, the filter is applied within the MAC sublayer management entity (MLME), above the MAC, or within the MAC itself. 0.517</p> <p>traffic filter: A set of traffic specifications defined by the use of traffic classification (TCLAS) elements that are utilized by the traffic filtering service (TFS) to identify specific allowed frames. 0.474</p> <p>unknown_definition_20:NOTE:There are 16 possible TID values; eight identify traffic categories (TCs), and the other eight identify parameterized traffic streams (TSs). The TID is assigned to an MSDU in the layers above the MAC. 0.458</p>

			<p>meaningful only to MAC entities that support QoS within the MAC data service. These MAC entities determine the TSPEC applicable for delivery of MSDUs belonging to a particular TS using the priority parameter provided with those MSDUs at the MAC service access point (MAC SAP).</p> <p>0.51</p>	<p>provided with those MSDUs at the MAC service access point (MAC SAP).</p> <p>0.566</p>	
19	Over what can DSE messages be exchanged	<p>DSE messages can be exchanged over the air, over distribution system (DS) or by mechanisms that rely on transport via higher layers</p>	<p>directed multicast service (DMS): A service in which the access point (AP) transmits group addressed frames as individually addressed frames to the requesting non-AP station (STA).</p> <p>0.491</p> <p>distribution system medium (DSM): The medium or set of media used by a distribution system (DS) for communications between access points (APs), mesh gates, and the portal of an extended service set (ESS).</p> <p>0.456</p> <p>dynamic station (STA) enablement (DSE): The process by which an enabling STA grants permission and dictates operational procedures to STAs that are subject to its control.</p> <p>0.437</p>	<p>directed multicast service (DMS): A service in which the access point (AP) transmits group addressed frames as individually addressed frames to the requesting non-AP station (STA).</p> <p>0.491</p> <p>dynamic station (STA) enablement (DSE): The process by which an enabling STA grants permission and dictates operational procedures to STAs that are subject to its control.</p> <p>0.421</p> <p>forwarding information: The information maintained by a mesh station (STA) that allows the mesh STA to perform its path selection and forwarding functions.</p> <p>0.402</p>	<p>access point (AP) reachability: An AP is reachable by a station (STA) if preauthentication messages can be exchanged between the STA and the target AP via the distribution system (DS).</p> <p>0.447</p> <p>dependent station (STA): A STA that is not registered and whose operational parameters are dictated by messages it receives from an enabling STA. Once enabled by the dynamic STA enablement (DSE) process, a dependent STA's continued operation becomes contingent upon being able to receive messages from its enabling STA over the wireless medium (WM).</p> <p>0.423</p> <p>distribution system medium (DSM): The medium or set of media used by a distribution system (DS) for communications between access points (APs), mesh gates, and the portal of an extended service set (ESS).</p> <p>0.401</p>
20	What is IBSS	<p>independent basic service set (IBSS): A basic service set (BSS) that forms a self-contained network, and in which no access to a distribution system (DS) is available.</p>	<p>independent basic service set (IBSS): A basic service set (BSS) that forms a self-contained network, and in which no access to a distribution system (DS) is available.</p> <p>0.735</p> <p>independent basic service set (IBSS) station (STA): A STA that has started or joined an IBSS.</p> <p>0.603</p> <p>quality-of-service (QoS) independent basic service set (IBSS): An IBSS in which one or more of its stations (STAs) support the QoS facility.</p> <p>0.554</p>	<p>independent basic service set (IBSS): A basic service set (BSS) that forms a self-contained network, and in which no access to a distribution system (DS) is available.</p> <p>0.53</p> <p>independent basic service set (IBSS) station (STA): A STA that has started or joined an IBSS.</p> <p>0.481</p> <p>quality-of-service (QoS) independent basic service set (IBSS): An IBSS in which one or more of its stations (STAs) support the QoS facility.</p> <p>0.472</p>	<p>access point (AP) reachability: An AP is reachable by a station (STA) if preauthentication messages can be exchanged between the STA and the target AP via the distribution system (DS).</p> <p>0.447</p> <p>dependent station (STA): A STA that is not registered and whose operational parameters are dictated by messages it receives from an enabling STA. Once enabled by the dynamic STA enablement (DSE) process, a dependent STA's continued operation becomes contingent upon being able to receive messages from its enabling STA over the wireless medium (WM).</p> <p>0.423</p> <p>distribution system medium (DSM): The medium or set of media used by a distribution system (DS) for</p>

					communications between access points (APs), mesh gates, and the portal of an extended service set (ESS). 0.401
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Table 7: Generator Performance from Glossary (PHY-MAC)

ID	Query	Expected Answer	Use Full Sentence	Use Defined Word	Use Definition
1	Explain EIRP	effective isotropic radiated power (EIRP): The equivalent power of a transmitted signal in terms of an isotropic (omnidirectional) radiator. The EIRP equals the product of the transmitter power and the antenna gain (reduced by any coupling losses between the transmitter and antenna).	EIRP stands for Effective Isotropic Radiated Power, which is a measure of the power of a transmitted signal in terms of an isotropic (omnidirectional) radiator.	EIRP stands for Effective Isotropic Radiated Power. It represents the equivalent power of a transmitted signal if it were emitted from an isotropic (omnidirectional) radiator.	EIRP stands for Effective Isotropic Radiated Power, which is a measure of the power of a transmitted signal in terms of an isotropic (omnidirectional) radiator.
2	Why do we need a beam steering matrix	beamforming steering matrix: A matrix determined using knowledge of the channel between a transmitter and an intended receiver that maps from space-time streams to transmit antennas with the goal of improving the signal power or signal-to-noise ratio (SNR) at the intended receiver	To improve the signal power or SNR at the intended receiver.	We need a beam steering matrix to map from space-time streams to transmit antennas, improving the signal power or SNR at the intended receiver	To transmit a PHY protocol data unit (PPDU) using beamforming.
3	Which framework supports higher precision traffic under a condition of limited resources	multi-level precedence and preemption (MLPP): A framework used with admission control for the treatment of traffic streams based on precedence, which supports the preemption of an active traffic stream by a higher precedence traffic stream when resources are limited. Preemption is the act of forcibly removing a traffic stream in progress in order to free up resources for another higher precedence traffic stream.	According to the passage, the framework that supports higher precision traffic under conditions of limited resources is the Quality of Service (QoS) framework.	Traffic Classification (TCLAS)	EPD is identified through the use of the "EtherType" field in the Ethernet header.
4	How is Ethertype protocol discrimination (EPD) identified?	medium access control (MAC) service tuple: The collection of a MAC service data unit (MSDU) along with the associated source address, destination addresses, priority, drop eligibility, service class, optional set of service_access_point_identifiers,	Based on the given paragraphs, EPD is identified through the use of a specific value in the EtherType field of an Ethernet frame.	EPD is identified through traffic classification (TCLAS)	Master Session Key (MSK)

		and optional indication of whether the supplied MSDU is in Ethertype protocol discrimination (EPD) or logical link control (LLC) protocol discrimination (LPD) format, which are all passed as parameters across the MAC service access point (SAP) and are all except the <code>service_access_point_identifiers</code> delivered across the distribution system between access points (APs), mesh gates, and the portal of an extended service set (ESS).			
5	What does GAS stand for?	registered location query protocol (RLQP): The query protocol for registered location information that is received and transported by generic advertisement service (GAS) Public Action frames.	Based on the given paragraphs, GAS stands for "Globally Unique Address Space."	GAS stands for "Grant-free Access Scheme."	Based on the given paragraphs, GAS stands for "Service Hash."
6	What is derived between EAP peer	master session key (MSK): Keying material that is derived between the Extensible Authentication Protocol (EAP) peer and exported by the EAP method to the Authentication Server (AS).	MSK	ESA	Master Session Key (MSK)
7	What are possible TID values	There are 16 possible TID values; eight identify traffic categories (TCs), and the other eight identify parameterized traffic streams (TSs). The TID is assigned to an MSDU in the layers above the MAC.	Eight	Possible TID values are not specified in the given paragraphs	Eight
8	What checks FILS authentication?	Integrity check key is used to for FILS authentication	According to the given paragraphs, FILS (Flexible Authentication through Interoperable Links and Services) authentication is checked by the Authentication Server (AS)	According to the given paragraphs, the Authentication Server (AS) checks FILS authentication.	According to the given paragraphs, the Authentication Server (AS) performs the check for FILS authentication.
9	What is difference between MFB requestor and response	MFB requestor that transmits a physical layer (PHY) protocol data unit (PPDU) containing an HT Control field in which the MCS request (MRQ) subfield is equal to 1 while MFB responder transmits a physical layer (PHY) protocol data unit (PPDU) containing an HT Control field with the MFB field containing an MCS index or the value 127 in response to a PPDU containing an HT Control field in which the MCS request (MRQ) subfield is equal to 1	MFB requestor refers to a device that initiates a Media Access Control (MAC) Functional Block (FBlock) Request, while MFB responder refers to a device that responds to such a request with a MAC FBlock Response.	MFB requestor refers to a device that initiates a Medium Frame Burst (MFB) request, while MFB responder refers to a device that responds to an MFB request.	A MFB requestor is a device that sends a Management Frame Body (MFB) request to another device, while a MFB responder is a device that receives an MFB request and responds with an MFB message.

10	What is adjacent channel rejection	Adjacent channel rejection refers to the ability of a wireless network to reject signals from neighboring channels and operate only on its intended channel	Adjacent channel rejection refers to the ability of a receiver to reject or ignore signals from neighboring channels that are close in frequency, allowing it to only detect and demodulate the desired signal on its own channel.	Adjacent channel rejection refers to the ability of a receiver to reject signals from neighboring channels that overlap with the desired signal.	Adjacent channel rejection refers to the ability of a receiver to reject signals from neighboring channels that overlap with the desired signal.
11	Why is nonce used	Nonce is a numerical value, used in cryptographic operations associated with a given cryptographic key, that is not to be reused with that key, including over all reinitializations of the system through all time.	To ensure it's not reused with a given key across all reinitializations of the system and throughout all time.	To ensure it's not reused with a given key.	To ensure liveness of a communication.
12	What is RLQP	RLQP is the query protocol for registered location information that is received and transported by generic advertisement service (GAS) Public Action frames.	Registered Location Query Protocol (RLQP)	Registered Location Query Protocol (RLQP)	RLQP stands for "Received Signal Power"
13	What is MAC SAP	MAC SAP is the service addressable points for MAC layer	In the context of the given paragraphs, "MAC SAP" refers to a "medium access control (MAC) service access point (SAP)"	MAC SAP = Medium Access Control Service Access Point	MAC Service Access Point (SAP).
14	What is CMMG	CMMG is China Millimeter Wave Multi Gigabyte Physical Specification	In the context of the given paragraphs, "MAC SAP" refers to a "medium access control (MAC) service access point (SAP)"	CMMG stands for "Counter Mode with Cipher-Block Chaining Message Authentication Code (CCM)".	CMMG stands for "Channel Master Modulation Group".
15	What is ERP in RFC 6696	RFC 6696 uses "ERP" for the abbreviation of EAP reauthentication protocol;	In RFC 6696, ERP stands for Emergency Response Protocol.	Extended Service Area (ESA)	In RFC 6696, ERP stands for Effective Radiated Power.
16	What is difference between HT beamformer and HT beamformee	A HT beamformer is an HT station (STA) that receives an HT physical layer (PHY) protocol data unit (PPDU) that was transmitted using a beamforming steering matrix and that supports a HT transmit beamforming feedback mechanism. Whereas a HT Beamformee is a HT station (STA) that transmits an HT physical layer (PHY) protocol data unit (PPDU) using a beamforming steering matrix.	HT beamformer = station that transmits using beamforming, HT beamformee = station that receives using beamforming	HT beamformer = STA that transmits using beamforming, HT beamformee = STA that receives beamformed transmission.	HT beamformer = hardware beamformer
17	What is IQMF	IQMF is An individually addressed Management frame that is transmitted using the quality-of-service management frame (QMF)			

		service. It stands for individually addressed quality-of-service management frame			
18	How are parametrized traffic streams identified?		According to the passage, parametrized traffic streams are identified by TID values, which are assigned to MSDUs in layers above the MAC.	According to the given paragraphs, parametrized traffic streams are identified through the use of traffic identifiers (TIDs)	According to the given paragraphs, parametrized traffic streams are identified using the last 8 TID values.
19	Over what can DSE messages be exchanged		Over the distribution system medium (DSM).	Over the air interface.	Over the wireless medium (WM).
20	What is IBSS		Independent Basic Service Set (IBSS)	Independent Basic Service Set (IBSS).	Independent Basic Service Set (IBSS).

Table 8: Generator Performance from Full Document (PHY-MAC) – Additional Questions

Query ID	Query	Expected answer	Search for paragraph	Search by sentence retrieve paragraph
F4	What is Error Vector Magnitude	Error vector magnitude (EVM). Is the error between the actual modulated and the theoretical modulated signal	Error Vector Magnitude (EVM) refers to the square root of the sum of the squares of the errors in the various components of the Location Estimate (LCI). In other words, it is a measure of the overall magnitude of the errors in the LCI.	Error Vector Magnitude (EVM) refers to the maximum allowable difference between the actual position of a satellite and its predicted position, expressed as a ratio of the actual distance traveled by the satellite to the total distance traveled during the mission. In other words, it represents the maximum error that can occur in the satellite's position determination.
F5	For wireless networks, why do well defined physical coverage areas not exist	For wireless PHYs, well-defined coverage areas simply do not exist. Propagation characteristics are dynamic and unpredictable. Small changes in position or direction might produce dramatic differences in signal strength. Similar effects occur whether a STA is stationary or mobile (as moving objects might impact station-to-station propagation)	Well-defined physical coverage areas do not exist for wireless networks because propagation characteristics are dynamic and unpredictable. Small changes in position or direction can produce dramatic differences in signal strength, making it challenging to define a consistent coverage area.	well-defined physical coverage areas do not exist for wireless networks because "propagation characteristics are dynamic and unpredictable." Small changes in position or direction can significantly affect signal strength, making it challenging to define a consistent and predictable coverage area

F6	What is Authentication server in wireless physical communications	Authentication Server (AS). The AS authenticates the elements of the RSNA itself, i.e., the STAs provide material that the RSNA elements use to authenticate each other.	an Authentication Server (AS) in wireless physical communications is an entity that provides an authentication service to an Authenticator. The AS determines, from the credentials provided by the Supplicant, whether the Supplicant is authorized to access the services provided by the Authenticator.	an Authentication Server in wireless physical communications refers to a device or system responsible for verifying the identity of stations (STAs) in a Wireless Local Area Network (WLAN). The Authentication Server controls access to the LAN by requiring STAs to provide proof of their identity using various authentication methods such as IEEE 802.1X-2010, Preshared Keys (PSKs), or Finite Field Cryptography (FFC)
F7	Describe Centralized coordination service set (CCSS)	A CCSS comprises a centralized coordination service root (CCSR) and a set of one or more synchronization APs that while operating are stationary with respect to their local environment and are connected to the CCSR via, for instance, one of the following: <ul style="list-style-type: none"> — The DS to an AP (or beyond, to a STA associated to the AP) — A combination of distribution system, portal, and external network 	A CCSS is a collection of one centralized coordination service root (CCSR) and a set of one or more synchronization access points (S-APs) that are stationary with respect to their local environment while operating and are connected to the CCSR. The CCSR provides coordination services for the CCSS, such as selecting the target beacon transmission time of S-APs within the CCSS to minimize interference.	Centralized coordination service set (CCSS) refers to a group of one centralized coordination service root (CCSR) and a set of one or more synchronization access points (S-APs) that are stationary with respect to their local environment while operating and are connected to the CCSR via, for instance, one of the following: a wired connection, a wireless connection, or a combination of both.
F8	Explain Tunneled direct-link setup	Tunneled direct-link setup (TDLS) is characterized by the use of signaling frames that are encapsulated in Data frames so that the signaling frames are transmitted through an AP transparently. Therefore, the AP does not need to be direct-link aware, nor does it have to support the same set of capabilities that are used on the direct link, in order for TDLS to be used. To allow a STA to enter a TDLS power save mode, TDLS provides two power save mechanisms: TDLS peer unscheduled automatic power save delivery (U-APSD) (TPU) and TDLS peer power save mode (PSM). TDLS allows STAs to use the TDLS PeerKey (TPK) handshake to provide data confidentiality and message authentication. STAs that set up a TDLS direct link remain associated with the AP and transmit frames directly to the other TDLS peer STA.	Tunneled direct-link setup (TDLS) is a protocol that enables non-Access Point (AP) stations (STAs) to establish a direct link without going through the AP. It uses signaling frames encapsulated in Data frames to transparently transmit these signals through the AP. As a result, the AP doesn't need to be direct-link aware, nor does it require the same level of capabilities as the direct link. TDLS provides two power save mechanisms: TDLS peer unscheduled automatic power save delivery (U-APSD) and TDLS peer power save mode (PSM). Additionally, TDLS employs the TDLS PeerKey (TPK) handshake for data confidentiality and message authentication. Once a TDLS direct link is established, the STAs can transmit frames directly to each other without passing through the AP.	Tunneled direct-link setup (TDLS) is a protocol that enables non-Access Point (AP) stations (STAs) to establish a direct link without requiring the AP to be direct-link aware or to support the same set of capabilities as the direct link.

F9	What is a mesh BSS?	A mesh BSS is an IEEE 802.11 LAN consisting of autonomous STAs. Inside the mesh BSS, all STAs establish wireless links with neighbor STAs to mutually exchange MSDUs. Further, using the multi-hop capability, MSDUs and Management frames can be transferred between STAs that are not in direct communication with each other over a single instance of the wireless medium. From the data delivery point of view, it appears as if all STAs in a mesh BSS are directly connected at the MAC layer even if the STAs are not within range of each other. The multi-hop capability enhances the range of the STAs and benefits wireless LAN deployments.	A mesh BSS (Basic Service Set) is a group of mesh stations (STAs) that use the same mesh profile and are not in direct communication with each other.	A mesh BSS (Basic Service Set) is a type of IEEE 802.11 LAN consisting of autonomous STAs (Stations) that form a self-contained network of mesh stations using the same mesh profile. A mesh BSS (Basic Service Set) is a group of mesh stations (STAs) that form a self-contained network using the same mesh profile. It contains zero or more mesh gates and is formed without a central entity like an AP in an infrastructure BSS.
F10	What is function of DMG Relay	DMG relay function allows a source relay endpoint DMG STA (REDS) to transmit frames to a destination REDS with the assistance of another DMG STA, the relay DMG STA (RDS),	The function of DMG (Distributed Management Group) relay is to allow a source relay endpoint DMG STA (REDS) to transmit frames to a destination REDS with the assistance of another DMG STA, the relay DMG STA (RDS).	The function of DMG relay is to allow a source REDS to transmit frames to a destination REDS with the assistance of another DMG STA, the relay DMG STA (RDS), improving the reliability of communication in a DMG BSS in cases where the direct link between the source and destination REDS has poor quality or is disrupted.
F11	What throughput can the CMMG STA support	CMMG STA provides PHY and MAC features that can support a throughput of 1 Gb/s and greater, as measured at the MAC data service access point (SAP).	The CMMG STA can support a throughput of 1 Gb/s and greater, as measured at the MAC data service access point (SAP)	The CMMG STA can support a throughput of 1 Gb/s and greater, as measured at the MAC data service access point (SAP). A CMMG STA supports MAC features that provide channel access in an environment in which transmissions use a directional antenna pattern or use multiple input multiple output antenna pattern
F12	What is difference between IBSS and PBSS	An important difference between the IBSS and the PBSS is that, within the PBSS, Beacon frames are not transmitted by every STA and instead only a single STA, namely the PCP, is responsible for DMG Beacon frame transmission. Within the IBSS, all STAs are responsible for Beacon frame transmission. When compared to the infrastructure BSS, the PBSS does not provide certain DSSs as described in 4.4.3	The main difference between IBSS (Independent Basic Service Set) and PBSS (Personal Basic Service Set) is the role of the central device. In an IBSS, no central device exists, while in a PBSS, one STA assumes the role of the PBSS control point (PCP) that provides the basic timing for the PBSS through DMG Beacon and Announce frames, as well as allocation of service periods and contention-based access periods.	The main difference between IBSS (Independent Basic Service Set) and PBSS (Personal Basic Service Set) is that in a PBSS, one STA assumes the role of the PBSS control point (PCP) and provides the basic timing for the PBSS through DMG Beacon and Announce frames, whereas in an IBSS, all STAs are responsible for Beacon frame transmission. Additionally, in a PBSS, Beacon frames are not transmitted by every STA, whereas in an IBSS, all STAs transmit Beacon frames.