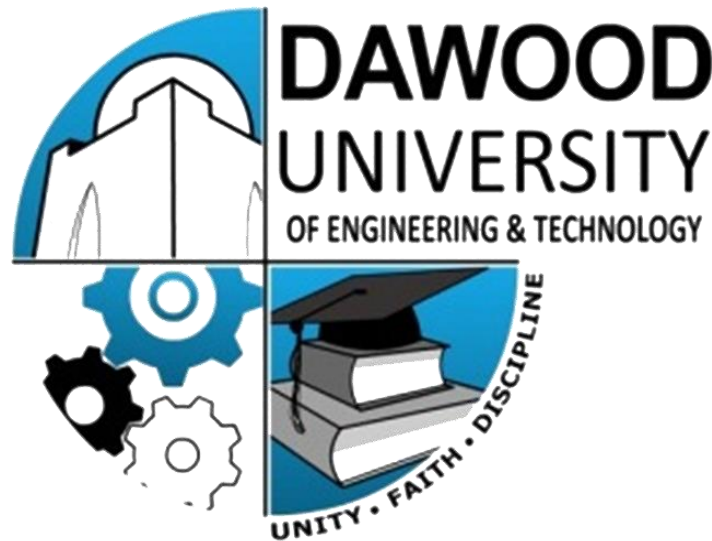


SCHEDULE OF REQUIREMENTS

(ICT Infrastructure Upgrade)

Part-2

Dawood University of
Engineering and Technology (DUET)



S #	Item Description	Specification	Quantity	Unit Price (Incl Tax)	Total Price (Incl Tax)	Delivery Period
1	Indoor Wireless Access Point (Cisco or equivalent)	<p><u>General Requirement</u></p> <ul style="list-style-type: none"> - Bidder must quote Wi-Fi Certified and Hot-spot 2.0 compliant product - The AP must be controller based enterprise class and high performance access point - The AP must have 2x1G ports - The AP must be able to support PoE/PoE+ standard. <p><u>Performance</u></p> <ul style="list-style-type: none"> - The AP must be compliant with IEEE 802.11ac wave-2 standard - The AP must support 4x4 MiMO and 4 spatial streams - The AP must provide 2.5G or better throughput - The AP must be able to support 200+ concurrent users - The AP must have at-least IP41 rating <p><u>Transmit Power/Antenna Gain</u></p> <ul style="list-style-type: none"> - The AP antenna gain should be minimum 6dBi for 2.4Gh and 5Ghz - The AP maximum support transmit power up to be 	125			45 Days

		<p>24dBm</p> <p><u>L2, L3 and QoS Features</u></p> <ul style="list-style-type: none"> - The AP must support LLDP standard - The AP must support SSID hiding and SSID based VLAN assignment - The AP must comply with WMM standard - The AP should also support WDS and Wireless Mesh Network <p><u>WLAN Features</u></p> <ul style="list-style-type: none"> - The AP should support 16 or more SSIDS or virtual APs - The AP must support beam forming, STBC, LDPC, MLD and MRC and similar signal enhancement technologies - The AP must support DFS to provide protection against interferences. - The AP must support WIDS/WIPS function - The AP must also support packet-based power adjustment to reduce power consumption and interference by adjusting transmit power to client - The AP must support L2 and L3 roaming - The AP must support 802.11k and 802.11v 				
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		<p>smart roaming</p> <ul style="list-style-type: none"> - The AP must support security encryption and authentication mechanism including WEP, WPA, WPA2, WAPI, AES, TKIP, IEEE 802.11w, IEEE 802.11x, AAA, RADIUS, EAP Types (including EAP-SIM) and PKI - The AP must support BYOD and location services including: <ul style="list-style-type: none"> ✓ Identifies the device type according to the OUI in the MAC address ✓ Identifies the device type according to the User Agent information in an HTTP packet ✓ Identifies the device type according to DHCP options ✓ The RADIUS server delivers packet forwarding, security, and QoS policies according to the device type carried in the RADIUS authentication and accounting packets - The AP must support spectrum analysis (without additional hardware or license) <p><u>High Availability:</u></p> <ul style="list-style-type: none"> - The AP must support Dual CAPWA tunnels to WLAN controllers to provide high availability and 				
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		<p>resiliency</p> <ul style="list-style-type: none"> - The AP should provide up to 4kV surge protection on network ports <p><u>Management</u></p> <ul style="list-style-type: none"> - The AP must support local management through console - The AP must support telnet and SSHv2 - The AP must support secure FTP <p><u>Warranty and Support Service:</u></p> <ul style="list-style-type: none"> - The proposed hardware must include three-year comprehensive warranty, support services and 9x5 next business day replacement 				
2	Outdoor Wireless Access Point (Cisco or equivalent)	<p><u>General</u></p> <ul style="list-style-type: none"> - Bidder must quote Wi-Fi Certified and Hot-spot 2.0 compliant product - The AP must be controller based enterprise class and high performance access point - AP must be equipped PoE+ injector. The PoE injector must be rugged and industrial grade to sustain environment conditions for outdoor deployment <p><u>Interface Requirement</u></p> <ul style="list-style-type: none"> - The AP must have 2x1GE RJ45 ports - The AP must have 1xGE 	3			45 Days

		<p>SFP ports</p> <ul style="list-style-type: none"> - The AP must be able to support PoE or PoE+ standard <p><u>Performance</u></p> <ul style="list-style-type: none"> - The AP must support IEEE 802.11ac wave-2 standard - The AP must support 3x3 MiMO and 3 spatial streams - The AP must provide 2.4G or better throughput - The AP must be able to support 100+ concurrent users - The AP must have at-least IP67 rating <p><u>Transmit Power/Antenna Gain</u></p> <ul style="list-style-type: none"> - The AP antenna gain should be minimum 10dBi for 2.4Ghz and 5Ghz - The AP maximum support transmit power up to be 25dBm <p><u>L2, L3 and QoS Features:</u></p> <ul style="list-style-type: none"> - The AP must support LLDP standard - The AP must support SSID hiding and SSID based VLAN assignment - The AP must comply with WMM standard - The AP should also support WDS and 				
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		<p>Wireless Mesh Network</p> <p>-</p> <p><u>WLAN Features:</u></p> <ul style="list-style-type: none"> - The AP should support 16 or more SSIDS or virtual Aps - The AP must support beam forming, STBC, LDPC, MLD and MRC and similar signal enhancement technologies - The AP must support DFS to provide protection against interferences. - The AP must support WIDS/WIPS function - The AP must also support packet-based power adjustment to reduce power consumption and interference by adjusting transmit power to client - The AP must support L2 and L3 roaming. - The AP must support 802.11k and 802.11v smart roaming - The AP must support security encryption and authentication mechanism including WEP, WPA, WPA2, WAPI, AES, TKIP, IEEE 802.11w, IEEE 802.11x, AAA, RADIUS, EAP Types (including EAP-SIM) and PKI. - The AP must support 				
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		<p>BYOD and location services including:</p> <ul style="list-style-type: none"> ✓ Identifies the device type according to the OUI in the MAC address ✓ Identifies the device type according to the User Agent information in an HTTP packet ✓ Identifies the device type according to DHCP options ✓ The RADIUS server delivers packet forwarding, security, and QoS policies according to the device type carried in the RADIUS authentication and accounting packets - The AP must support spectrum analysis (without additional hardware or license) <p><u>High Availability:</u></p> <ul style="list-style-type: none"> - The AP must support Dual CAPWA tunnels to WLAN controllers to provide high availability and resiliency - The AP should provide up to 4kV surge protection on antenna ports. - The AP should provide up to 4kV surge protection on network ports. - The AP should support operating temperature from -40°C to +60°C to sustain the harsh 				
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		<p>environment conditions for outdoor deployment.</p> <p><u>Management:</u></p> <ul style="list-style-type: none">- The AP must support local management through console- The AP must support telnet and SSHv2- The AP must support secure FTP <p><u>Warranty and Support Service:</u></p> <ul style="list-style-type: none">- The proposed hardware must include three-year comprehensive warranty, support services and 9x5 next business day replacement directly from OEM				
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