SCHOOL OF TECHNOLOGY, KANO STATE POLYTECHNIC, KANO

EMBEDDED SYSTEM DEVELOPMENT ASSIGNMENT QUESTIONS

HND/SWD/23/0001	BASHIR DAHIRU UMAR	1.You are designing an automatic door control system for a shopping mall. Explain how an embedded system is used in this scenario and list the essential hardware components required. 2.List and explain at least five characteristics of embedded systems. 3.Differentiate between embedded systems and general-purpose computing systems. 4.Identify ten real-world applications of embedded systems.	GROUP 1
HND/SWD/23/0002	ZAINAB SUNUSI TIJJANI		
HND/SWD/23/0003	MANNIR ILIYASU YUSUF		
HND/SWD/23/0004	ZAINAB IBRAHIM USMAN		
HND/SWD/23/0005	RUKAYYA USMAN MUHAMMAD		
HND/SWD/23/0006	USAMA HAMZA		
HND/SWD/23/0007	MUNIRA MUHAMMAD ISAH		
HND/SWD/23/0008	AISHA YUSUF SALIHU		
HND/SWD/23/0009	SADIQ BABA SALIHU		
HND/SWD/23/0010	AHMAD SANI AHMAD		
HND/SWD/23/0011	ADAM MUHAMMAD ABDULLAHI	1.Explain the classification of embedded systems based on performance and functional requirements. 2.A factory needs a temperature monitoring system to maintain safety regulations. Which type of embedded system (standalone, real-time, or networked) would you recommend and why? Also identify components needed to achieve the desired goal. 3.Describe the differences between small-scale, medium-scale, and sophisticated embedded systems. 4.Explain why power consumption is an important factor in embedded system design.	GROUP 2
HND/SWD/23/0012	AISHA KABIR INDABAWA		
HND/SWD/23/0014	HUMAIRA MUDI LAWAN		
HND/SWD/23/0016	FATIMA ABUBAKAR MATAWALLE		
HND/SWD/23/0017	BABANGIDA		
HND/SWD/23/0018	HUSAINI MUHAMMAD		
HND/SWD/23/0020	HASSAN ABDULLAHI USMAN		
HND/SWD/23/0021	SIBAWAIHI MUHD MURTALA		
HND/SWD/23/0022	UMAR MUKHTAR UMAR		
HND/SWD/23/0023	HASIYA MUSTAPHA MUHAMMAD		
HND/SWD/23/0024	HAFSAT HASSAN SANI	1.You are given an ESP32 and an Arduino Uno to build a smart home automation system. Compare their features and justify which one is more suitable. 2.Discuss at least three challenges faced in embedded system development. 3.Define the term "firmware" and explain its role in an embedded system. 4.Describe the main components of an embedded system.	GROUP 3
HND/SWD/23/0025	HALIMA SANI DARMA		
HND/SWD/23/0026	ISMAIL IBRAHIM IDRIS		
HND/SWD/23/0027	MUHSIN ADO ABUBAKAR		
HND/SWD/23/0028	HABIBA ALIYU MUHAMMAD		
HND/SWD/23/0029	AISHA IBRAHIM UMAR		
HND/SWD/23/0030	MARYAM MUHAMMAD ADAM		
HND/SWD/23/0031	HADIZA HARUNA		
HND/SWD/23/0032	RUKAYYA JIBRIL SULAIMAN		
HND/SWD/23/0033	IBRAHIM UMAR MADUGU		

HND/SWD/23/0035	BELLO SANI BELLO	1.A smart irrigation system requires sensors to detect soil moisture and automatically activate a water pump. List the essential sensors, actuators, and microcontrollers needed for this system. 2.Explain the function of sensors and actuators in embedded systems. 3.What is the difference between microcontrollers and microprocessors? 4.Explain how memory types (RAM, ROM, Flash Memory, and EEPROM) are used in embedded systems.	GROUP 4
HND/SWD/23/0037	HASSAN TIJJANI HASSAN		
HND/SWD/23/0039	MANSUR AUWALU MIJINYAWA		
HND/SWD/23/0041	AISHA YUSUF		
HND/SWD/23/0042	SADIK BADAYI ABBA		
HND/SWD/23/0043	BELLO SUYUDI ADAM		
HND/SWD/23/0044	AMINU SARKI ABDULLAHI		
HND/SWD/23/0045	AISHA JA'AFAR KULO		
HND/SWD/23/0047	AMINA ABDULLAHI MAHMOUD		
HND/SWD/23/0048	ZAINAB SALIHU MAIKARFI		
HND/SWD/23/0049	ABDULMUTALLAB MOHAMMAD	1.You are tasked with developing a traffic light control system using an embedded microcontroller. Identify three hardware components you need and their functions. 2.Describe the key components of an Arduino development board. 3.Explain the requirements analysis stage in embedded system design. 4.Why is system integration a critical phase in embedded system development?	GROUP 5
HND/SWD/23/0050	IDRIS ISAH ABDULLAHI		
HND/SWD/23/0051	UMAR JABIR UMAR		
HND/SWD/23/0052	AHMAD BASHIR MAHMUD		
HND/SWD/23/0053	SALIM UBA SAID		
HND/SWD/23/0054	HALIMA SANI LAWAN		
HND/SWD/23/0055	USMAN SHEHU ABDULLAHI		
HND/SWD/23/0056	FATIMA AHMAD BAYERO		
HND/SWD/23/0059	FATIMA HAMISU MUHAMMAD		
HND/SWD/23/0060	HAJARA SHAZALI SAAD		
HND/SWD/23/0061	SADIYA UMAR	1. You need to design an automatic water dispenser for pets. What are the key specifications you must define before starting the project? 2. What factors influence hardware selection in embedded system development? 3. Explain how testing and debugging are performed in embedded systems. 4. What is an embedded system communication interface?	GROUP 6
HND/SWD/23/0062	MUHAMMAD SANI YAHAYA		
HND/SWD/23/0063	FARUQ MUHAMMAD		
HND/SWD/23/0064	IBRAHIM MUHAMMAD DANYARO		
HND/SWD/23/0065	HARIS HARIS ADAM		
HND/SWD/23/0066	RASHEEDAT ABDULAZEEZ		
HND/SWD/23/0067	MUHAMMED KABIR AHMED		
HND/SWD/23/0068	ADEBISI ADIJAT ABIDEMI		
HND/SWD/23/0069	MUHAMMAD ABUBAKAR		
HND/SWD/23/0070	MUSA MAMUDA GAJIDA		

HND/SWD/23/0071	ADAMU USMAN	1.A company wants a biometric attendance system for its office. Explain how you would architect the system, including hardware selection and communication interfaces. 2.Differentiate between onboard and external communication interfaces. 3.Describe I2C (Inter-Integrated Circuit) and its use in embedded systems. 4.List at least four examples of wireless communication interfaces used in embedded systems.	GROUP 7
HND/SWD/23/0072	SHAMSU ISYAKU ALI		
HND/SWD/23/0073	HALIFA KABIR		
HND/SWD/23/0074	MUJIBURRAHMAN MUJITTAPHA IDRIS		
HND/SWD/23/0076	USAMA NUHU UMAR		
HND/SWD/23/0077	SANIABUBAKAR874@GMAIL.COM		
HND/SWD/23/0080	ABDULLAHI AUWALU IDRIS		
HND/SWD/23/0081	NAFISAT AMINU JAAFAR		
HND/SWD/23/0082	COMFORT ADAMU ALI		
HND/SWD/23/0083	FARUQ MAHRAZ		
HND/SWD/23/0084	HARUNA ABUBAKAR LIYE	1.Your team is developing a weather station using an ESP32. Describe the steps involved in the embedded system design process, from requirements analysis to system integration. 2.How does Wi-Fi communication work in embedded systems? 3.What is ZigBee and where is it commonly used? 4.Define embedded firmware and explain its role in embedded systems.	GROUP 8
HND/SWD/23/0085	AHMAD JAFAR MUHAMMAD		
HND/SWD/23/0086	ABDUL ALI LAWAN		
HND/SWD/23/0087	RUKAYYA BELLO ABUBAKAR		
HND/SWD/23/0089	AISHA BASHIR KURAWA		
HND/SWD/23/0090	ABDURRAHIM ABUBAKAR SANI		
HND/SWD/23/0091	ABUBAKAR ABDULLAHI SALISU		
HND/SWD/23/0092	MARYAM MUHAMMAD		
HND/SWD/23/0093	SAMINU ISMAIL KADEMI		
HND/SWD/23/0094	SUMYYA SALISU ALA		
HND/SWD/23/0095	HAUWAU ABDULHAKEEM	1. A company wants to install a fire detection and alarm system in a shopping mall. Suggest a sensor-based embedded solution, specifying hardware components and system operation. 2. Why is it important to optimize memory usage in embedded firmware development? 3. What is an RTOS (Real-Time Operating System)? 4. List and briefly describe three examples of RTOS used in embedded systems.	GROUP 9
HND/SWD/23/0096	ABDURRAHMAN ADAMU		
HND/SWD/23/0098	SANI ADAMU YUNUSA		
HND/SWD/23/0100	YUSUF SALISU MUAZU		
HND/SWD/23/0102	SUMAYYA IBRAHIM ABDULLAHI		
HND/SWD/23/0103	ABBA HAMISU MIJINYAWA		
HND/SWD/23/0104	HAFIZU UMAR		
HND/SWD/23/0105	ISAH ABDULLAHI ISAH		
HND/SWD/23/0107	MUKHTAR AHMAD MAHE		
HND/SWD/23/0109	MAHMUD ABUBAKAR KABIR		

HND/SWD/23/0110	MUHAMMAD ABDULKADIR USMAN	1.A home security system requires a camera module to send data to a cloud server. Which wireless communication interface (Wi-Fi, ZigBee, GSM, LoRa) is best suited for this task? 2.Explain the role of task management in an RTOS-based system. 3.What factors influence the choice of an RTOS for an embedded system? 4.Compare preemptive scheduling and cooperative scheduling in RTOS-based embedded systems.	GROUP 10
HND/SWD/23/0111	AISHA MUSA ISAH		
HND/SWD/23/0112	USMAN UMAR MUSA		
HND/SWD/23/0115	AMATULHAKEEM A.ABDULLAHI		
HND/SWD/23/0116	BELLO SADIYA WAZIRI		
HND/SWD/23/0117	MUAZZAM BALA SALE		
HND/SWD/23/0118	USMAN MUSA HASSAN		
HND/SWD/23/0119	SADIYA MOHAMMED		
HND/SWD/23/0122	ADAM IBRAHIM ISAH		
HND/SWD/23/0126	AMIR BASHIR LAWAN		
HND/SWD/23/0127	HAFSA MUSA HASSAN	"1. You are designing an automatic door control system for a shopping mall. Explain how an embedded system is used in this scenario and list the essential hardware components required. 2. List and explain at least five characteristics of embedded systems. 3. What factors influence hardware selection in embedded system development? 4. List and briefly describe three examples of RTOS used in embedded systems.	GROUP 11
HND/SWD/23/0131	IBRAHIM AHMAD ISYAKU		
HND/SWD/23/0132	ISAH ISMAIL		
HND/SWD/23/0134	SAFINA ABDULLAHI AHMAD		
HND/SWD/23/0135	ZAINAB SHEHU GARBA		