Type: DES

Q1. Compare 5 types of electrical power generation techniques available in civil and military aircrafts. Give example of each. (2)

Q2. What is IMA? Explain the A-330 EFIS/ECAM architecture with neat diagram. (3)

Q3. Design an autopilot system to control the aircraft for the following cases during autonomous landing: (i) Localizer coupling loop, (ii) Glide path coupling loop and (iii) flare control loop. (5)

Q4. Derive the position of aircraft with correction of DGPS signal installed within 100 km range. Explain the working principle of it in SBAS. (3)

Q5. With neat diagram, explain the word format, message format and transmission media used in MIL-STD-1553 communication protocol to transmit information from AHRS to Primary Flight Display (PFD). (4)

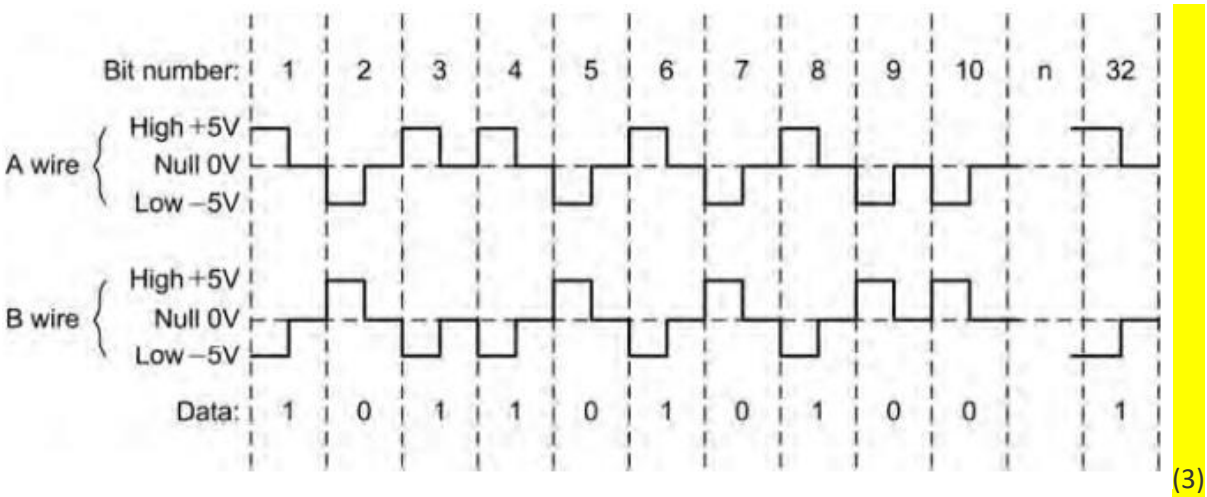
Q6. During approach, what is the function of ADF, VOR and DME? Highlight the function of onboard equipment installed in the aircraft in this scenario. (3)

Q7. Defend the synchronization logic and requirement of sensor data in single coordinate frame and algorithm in the GNSS-INS integration scheme. Explain with neat diagram. (2)

Q8. Design a redundant and reconfigurable primary and secondary control surface actuation system in modern airbus aircraft. Sketch and highlight energy driven, symmetrical design of control surfaces and explain the quadruplex redundancy. (5)

Q9. Design the generalized symbology generation of head-up-display with neat diagram for one of the design available in the market. (3)

Q10. In the aircraft data signal flow shows two twisted wires as shown in the figure. Identify the databus used in the aircraft and explain its electrical characteristics and communication protocols.



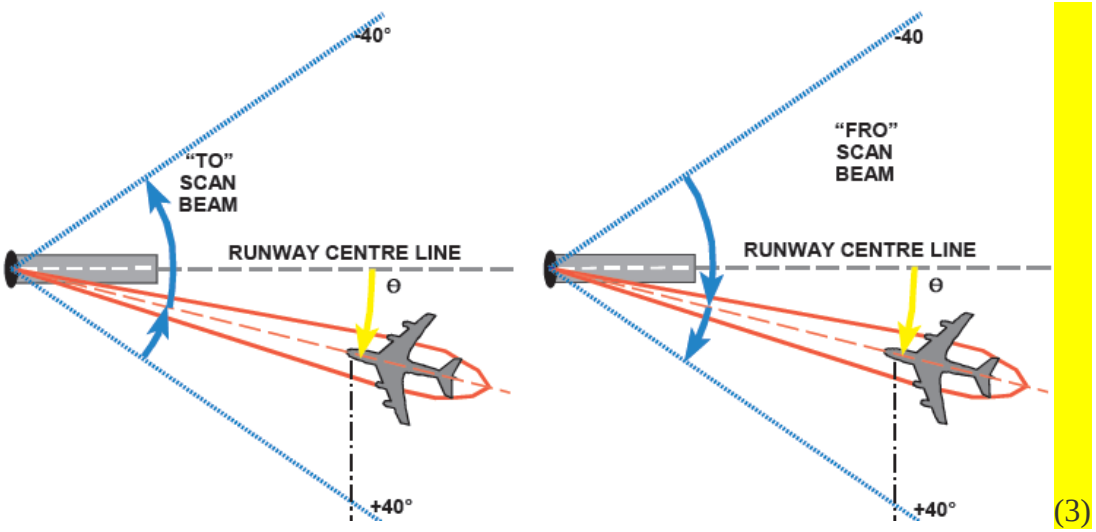
(3)

Q11. Sketch the diagram of the following cases with onboard indication:

(i) A case when the aircraft is located left of the runway's axis and too low under the glide slope

(ii) TRSB Component

(iii) Write function of given figure:



(3)

Q12. Derive the requirements of cockpit design and integration of avionics systems in modern Boeing aircraft. Sketch the cockpit layout in 2D. (4)

Q13. With neat diagram analyze the flight management system function in the case of failure of one of the FMC. (2)

Q14. Design with a neat diagram of AC and DC total electrical power systems in A380 aircrafts. Discuss the system engineering involved in it's design and briefly highlight the components used in it. (5)

Q15. Figure given below represents Flight data recorder system codes. Identify the Non - return -to zero (NRZ) and Bipolar -return -to zero (Bipolar RZ) and explain them using the given figure. (3)