BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
FIRST SEMESTER 2023 - 2024
AIRPORT PLANNING & DESIGN – Mid Semester Exam - Regular

Course No: CE G545 **Date: 11-10-2023 [4:00 PM start]**
Duration: 90 Mins (Closed book) **Max. Marks: 70**

I: Choose the best answers **[10 x 1 = 10 marks]**

1. MALW is the maximum demonstrated landing weight to keep the _____ at the maximum sink rate
2. ACDM stands for _____
3. Wet runway generally requires shorter runways than dry runways (True/False)
4. When no data is available, _____ is the standard weight suggested by ICAO for a passenger plus its baggage.
5. Aerodynamic forces depend on _____ and _____
6. MPPA stands for _____
7. Brakes are applied when the aircraft is passing the runway threshold (True/False)
8. One of the conditions of basic runway length is "no wind is blowing on runway" (True/False)
9. The angle that the wing is inclined into the air flow is _____
10. The horizontal distance traversed by the aeroplane from a point on the _____ above the landing surface to the point on the landing surface at which the aeroplane comes to a complete stop.

II: Short answers **[10 x 2 = 20 marks]**

1. What is the connection between MGTOW and the type of aircraft?
2. What are declared distances?
3. What is PHP? Why is it important to measure?
4. What is the difference between primary surface and approach surface?
5. What is meant by hardstand?
6. Explain TRASM.
7. What is meant by "service ceilings"?
8. Define airside capacity.
9. What is meant by advanced planning in the context of terminal building?
10. What is the problem with overloading of an aircraft?

III: Long answers:

1) Determine the actual length of the runway required for take-off if the length required for landing and take-off under standard atmospheric conditions at sea level are 1900 m and 1600 m respectively. The airport elevation can be assessed using the following data and the airport reference temperature is 20 deg C. The effective gradient can be taken as 1%. [15 marks subject to calculation of RLs in the table]

Data for the calculation of Reduced Level:

In order to calculate the airport elevation, the following readings were taken with a tilting level and a 4 m levelling staff on a continuously sloping ground at common intervals of 30 m. The continuously sloping ground indicates that there is no undulation (it is either sloping downwards or sloping upwards). 0.800 (BM), 1.400. 2.300, 3.000, 3.550, 0.900, 1.200, 2.000, 2.850, 3.450, 0.700, 1.000, 1.400 (Final point). The RL of the starting point (BM) is 400 m. Make entries in a

level book and apply the usual checks using Rise & Fall method. **The airport elevation above sea level is the RL corresponding to the spot level position of 1.400.** The below format may be used to calculate the RL.

Staff position	Back sight	Inter sight	Fore sight	Rise	Fall	RL	Remarks
1						**400 m**	Bench Mark
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							

Important Note: After doing the above exercise, the RL corresponding to 11th staff position (airport elevation) has been found out to be 394 m. This is only meant for you to proceed with further calculations. However, if the calculation is not shown in the above table as to how you got 394 m, this question will be evaluated only for 8 marks.

2) The following are the data pertaining to the airport operations.

The flight from Hyderabad is scheduled to land the airport (as per ATC) at New Delhi IGIA at 3 PM in the afternoon. However, the actual landing time (as per ATC) is 4 PM. The updated scheduled in-block time is 4:15 PM and the actual in-block time is 4:25 PM. The scheduled off-block time is 6:00 PM, but target off-block time is only 6:30 PM.

a) Calculate actual taxi-in time [2 marks]

b) Calculate scheduled taxi-in time considering the updated scheduled in-block time. [2 marks]

c) Calculate the actual off-block time (considering that there is no other extra delay in the turnaround process) and the actual turnaround time. [4 marks]

d) Calculate the appropriate Target Start-UP Approval Time and appropriate Target Take-off Time considering the EXOT is 25 minutes. [4 marks]

e) Why turn-around time is important from airport planning viewpoint? [3 marks]

g) What is EXIT and EXOT? How EXIT and EXOT affects entire planning operations? [3 marks]

3) Explain the functional components of terminal building. [7 marks]