

BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
FIRST SEMESTER 2023 - 2024

AIRPORT PLANNING & DESIGN – Comprehensive Exam - Regular

Course No: CE G545

Date: 12-11-2023 [2:00 PM start]

Duration: 90 Mins (Closed book)

Max. Marks: 30

I: Choose the best answers

[10 x 1 = 10 marks]

- 1) CAGR stands for _____
- 2) 10/28 stands for _____ (in the context of runway)
- 3) Drag acts in the direction opposite to the direction of motion (True/False)
- 4) TRASM stands for _____
- 5) Box-Jenkins method is only appropriate for very short-term forecasts. (True/False)
- 6) Revenue passenger is a passenger carried for which the airline receives remuneration and includes passengers as compensation for denied boarding.
- 7) The stickiness characteristic is captured by Reynolds number (True/False)
- 8) Airport Development Implementation Plan comes under the category of _____ planning.
- 9) Time series forecasting treats the system as a 'black box' and does not attempt to discover the factors affecting demand (True/False)
- 10) The lowest part of an aircraft structure in which water and contaminants collect (True/False)

II: Short answers

[10 x 2 = 20 marks]

- 1) Define PHP.
- 2) Do you want aircraft to be heavy or light? Explain.
- 3) What is the advantage of Delphi technique?
- 4) Explain the connection between dwell time in the arrival forecourt and departure forecourt.
- 5) What is the difference between airborne hours and block hours?
- 6) What are the major steps in the site evaluation and selection process?
- 7) What is the difference between economic planning and financial planning?
- 8) How to differentiate between utility airport and transport airport?
- 9) What are the common problems with respect to overloading an aircraft?
- 10) What is reconnaissance survey?

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I: Long answers

1) Highlight three important aspects of good planning of greenfield airport (you need to highlight with respect to the following constraints). [15]

Key constraints:

- a) The airport is located in a city where there is already a presence of one more airport (operating for 25 years).
- b) It is a metropolitan location with industrial and commercial activities. There is space constraint on airside.
- c) Rainfall is generally heavy, but rainfall data is scarce
- d) Bearing capacity is relatively low
- e) Passenger flow is slightly abnormal (few peaks followed by few lows)

2 (a) An airport has 4 gates which are available for all the aircraft. It serves three classes of aircraft having mix and average occupancy time during peak hour as follows. [7]

Aircraft Class	Mix (%)	Average occupancy time in minutes
1	40	60
2	40	45
3	20	30

If the maximum gate utilization factor is 60%, find the capacity of the gates at this airport to process the aircraft.

2 (b) Also, briefly highlight the positioning of gate planning in the overall planning process. [3]

3) a) The monthly mean temperatures of the atmosphere, at a particular site, where an airport has to be developed, are given below. Determine the airport reference temperature. If the site is at mean sea level, determine the actual runway length. The runway is assumed to be level. [5]

Month	Temperature - Mean value of average daily Temperature (T1)	Temperature – Mean value of Maximum daily Temperature (T2)
January	3	5
February	15	17
March	20	23
April	25	32
May	37	45
June	35	50
July	32	37
August	30	35
September	27	31
October	22	28
November	12	18
December	6	9

3 (b) There are few conditions where runway length needs to be increased. Briefly highlight those conditions. [5]

4) Highlight the distresses from structural viewpoint and enunciate the reasons. How structural distresses are different from functional distresses? [5]