

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS: B.TECH  
BRANCH: CIVIL ENGINEERING**

**SEMESTER : VI  
SESSION : SP/2024**

**SUBJECT: CE423 HARBOUR AND AIRPORT ENGINEERING**

**TIME: 3 Hours**

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- |        |  | CO    | BL |
|--------|--|-------|----|
| Q.1(a) | Define a port and bring out the difference between a port and harbour.   | [5] 1 | K1 |
| Q.1(b) | Describe the classification of harbour based on protection needed, utility and location.   | [5] 1 | K2 |
|        |  |       |    |
| Q.2(a) | What are the various navigational aids used in harbour? Explain with diagram.  | [5] 2 | K1 |
| Q.2(b) | Classify various types of lock gates.  | [5] 2 | K2 |
|        |  |       |    |
| Q.3(a) | What are the types of imaginary surfaces? Explain with diagram.  | [5] 3 | K1 |
| Q.3(b) | Discuss the importance of the turning zone with the help of a diagram showing its profile.   | [5] 3 | K2 |
|        |  |       |    |
| Q.4(a) | Describe the various corrections applied to the calculated basic runway length to get its actual runway length.  | [5] 4 | K2 |
| Q.4(b) | Determine the radius of a taxiway for a subsonic aircraft to negotiate the curve at a turning speed of 75 kmph. The wheel base is 30 m and the wheel tread is 6 m. The airport is of A type as per ICAO. | [5] 4 | K5 |
|        |  |       |    |
| Q.5(a) | What is the purpose of installing visual aids at the airport? What are markings made on runways?   | [5] 5 | K2 |
| Q.5(b) | 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:                                  | [5] 5 | K5 |

Aircraft Class	Mix (%)	Average occupancy time in minutes
1	30	60
2	50	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.

\*K1- Remember; K2- Understand; K3- Apply; K4- Analyse; K5- Evaluate; K6- Create

:26/04/2024:M