

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2023****Subject Code:3174022****Date:19-12-2023****Subject Name: Airport and Seaport Engineering****Time: 10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

- Q.1**
- (a) List out the requirements of an ideal airport layout. **03**
- (b) With a neat sketch write short note on “Visual aids” for the airport. **04**
- (c) Draw the Type-I Wind-rose diagram from the given data and suggest the direction for the runway orientation. **07**

Direction	%
N	6.5
NNE	8
NE	3
ENE	9.7
E	2
ESE	12
SE	10
SSE	5
S	6
SSW	3
SW	4
WSW	6
W	11
WNW	5
NW	2
NNW	0

- Q.2**
- (a) Show the components in detailed C/S sketch of typical runway. **03**
- (b) Draw the typical layout of a harbor with port. Show all components and write their functions. **04**
- (c) Compute the corrected runway length for: Runway length at sea-level, std. atmospheric pressure, temperature and zero gradient = 1280 m, Site elevation = 85 m from MSL, ART = 22° C, effective gradient = 0.5 % **07**

OR

- (c) Estimate the bulk cargo for the year 2029 with the help of Geometrical Increase Method using the following data. 07

Year	Bulk Cargo
	DWT
	(Million Ton)
2015	37
2016	40
2017	44
2018	49
2019	58
2020	59
2021	63
2022	70
2023	75
2024	80

- Q.3** (a) Give difference between wind rose type 1 and wind rose type 2 diagram. 03
 (b) List out the surveys to be carried out for seaport planning 04
 (c) If length of design vessel is 205 m and beam is 25 m, determine following as per the IS provisions: 07
 (i) Stopping distance in the entrance channel when vessel is fully loaded,
 (ii) Bottom width of 2 lane channel
 (iii) Diameter of Turning basin without tug assistance.

OR

- Q.3** (a) What are the merits and demerits of road transportation 03
 (b) Briefly explain with sketch: 'Minimum Turning Radius' of an aircraft 04
 (c) Determine the (i) Radius of central curve, (ii) Length of entrance curve, (iii) Stopping distance, for the Exit Taxiway joining a runway and a parallel main taxiway. Take turn off speed of an aircraft is 100 kmph, coefficient of friction between tire and pavement is $f = 0.15$, coefficient $C = 0.4$, and deceleration rate $= 1.2 \text{ m/sec}^2$ 07

- Q.4** (a) Explain why buoys and beacons are used. 03
 (b) Give the characteristics of a good seaport 04
 (c) Write short note on "Visual aids" for the airport along with a neat sketch 07

OR

- Q.4** (a) Give difference between wharf and jetty 03
 (b) List out the various mooring accessories. 04
 (c) Explain surface and sub-surface drainage system at airport. 07

- Q.5** (a) List out the various dredger types 03
 (b) Draw a sketch for Dry dock 04
 (c) Give the functions of the mound type breakwater along with the sketch. 07

OR

- Q.5** (a) Give the major seaports in India 03
 (b) Draw the detailed sketches of a typical ship and show their dimensions and components. 04
 (c) Draw the detailed sketches of a typical aircraft. Also, briefly describe the functions of fuselage, elevator, rudder, aileron, flaps, winglet, and spoiler 07
