

QP Code: 85246

Time: (3 Hours)

[Total Marks: 80]

- Note: i. Q. No. 1 is compulsory
ii. Attempt any 3 out of remaining 5
iii. Support all theory and numerical with neat sketch

1. Solve any four (20 M)
- Compare harbors and Docks and discuss on its various types
 - Discuss different types of gradients in railway engineering, If the ruling gradient is 1 in 150 on particular section of BG Track and 4 degree curve is situated, what should be the allowed ruling gradient
 - Explain head wind, cross wind and calm period. Which head wind can cause trouble in lading and take off of aircraft
 - Compare different modes of public transport available in Mumbai.
 - Enlist types of bearings and what is its purpose and explain any one type.
 - Write a note on National Urban Transport Policies.
2. A. The runway length required at sea level in standard atmospheric condition is 1800 m. the airport has an elevation of 150m. ART is 32.94 degree Celsius. If effective gradient is 0.20 percent, find corrected runway length. (10 M)
- B. Determine capacity of 15 gates that serves 3 class of aircraft using following data Assume gate utilization as 60% (10 M)

Aircraft class	Mix %	Avg occupancy time (min)
1	10	25
2	25	35
3	40	60

3. A. Design an exit taxiway joining a runway and a parallel main taxiway. The total angle of turn is 30 degrees and turn off speed is 80kmph. Draw a neat sketch and show all elements. (10 M)

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B. Select the orientation of runway for the following wind data by Windrose Type 1

(10 M)

TYPICAL WIND DATA

Wind direction	Percentage of time			Total percentage in each direction
	6-25 km p.h.	25-50 km p.h.	50-80 km p.h.	
N	4.6	1.40	0.10	6.10
NNE	3.4	0.75	0.00	4.15
NE	1.8	0.03	0.10	1.93
ENE	2.8	0.02	0.03	2.85
E	2.1	2.20	0.00	4.30
ESE	5.4	4.75	0.00	10.15
SE	6.4	1.40	0.00	7.80
SSE	7.5	0.02	0.00	7.52
S	4.6	1.40	0.10	6.10
SSW	2.4	0.75	0.00	3.15
SW	1.2	0.03	0.10	1.33
WSW	3.6	0.02	0.03	3.65
W	1.8	2.20	0.00	4.00
WNW	6.0	4.75	0.00	10.75
NW	5.9	1.40	0.00	7.30
NNW	6.9	0.02	0.00	6.92

4. A. Discuss on Negative Super-elevation. Also, if 8° curve track diverges from main curve of 5° in an opposite direction in a layout of B.G yard, calculate Super-elevation and speed on branch line if maximum speed permitted on main line is 45kmph. (10 M)

B. Explain lighting and marking on runway. (10 M)

5. A. Discuss on Transit Oriented Development and Sustainable transport. (10 M)

B. Following are the costs involved in a uniform multiple span bridge construction. Calculate the economic span (10 M)

Span (m)	5	10	15	20
Cost of girder (Rs.)	4000	13000	26000	45000
Cost of single pier and its foundation (Rs.)	16,000	18,000	22,000	25,000

6. A. Draw and label the layout of Bridge and explain various components with their functions (10 M)

B. A taxiway is to be designed for operating boeing 707. determine turning radius for following data: (10 M)

Wheel base 17.70 m

Tread of main loading gear 6.62 m

Turning speed 40 kmph

Coefficient of friction 0.1

Width of Taxiway 22.5

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