32°C. The construction plan provides the following data:

| End of end of runway(m) | 0-320 | 300-900 | 900-1500 | 1500-1800 | 1800-2100 | 2100-2700 | 2700-3000 |
|---|---|---|---|---|---|---|---|
| Grade (%) | +1 | -0.50 | +0.50 | +1 | -0.50 | -0.40 | -0.10 |

Determine the length of runway. Apply corrections for elevation and temperature as per ICAO and gradient as per FAA specification. 14

7. (a) Explain with neat sketches, the various marking on runways. 7

(b) Find the capacity of the 12 gates for exclusive use of the three classes of aircraft using the following data: 7

| Aircraft Class | Gate group | Number of gates | Mix(%) | mean Service time (min) |
|---|---|---|---|---|
| 1 | A | 2 | 15 | 25 |
| 2 | B | 4 | 35 | 45 |
| 3 | C | 6 | 50 | 60 |

8. (a) Explain the necessity of airport lighting. 5

(b) Design an exit taxiway joining a runway and a parallel main taxiway. The total angle of turn is 30° and the turn of speed is 80 kmph. Draw a neat sketch and shows therein all the design elements. 9

9. (a) What is the various design factors are considered for the runway pavement? Explain all the factors. 7

(b) Discuss the aircraft parking systems in details. 7

***





**Code : 011834**

**B.Tech. 8th Semester Exam., 2017**

**Airport Planning and Design**

*Time : 3 hours* *Full Marks : 70*

***Instructions :***

*(i) The marks are indicated in the right-hand margin.*

*(ii) There are **Nine** questions in this paper.*

*(iii) Attempt **Five** questions in all.*

*(iv) Questions No. 1 is compulsory.*

1. Answer any seven questions from the following multiple choice type questions: 2×7=14

(i) Airport elevation is the reduced level about mean sea level of

(a) control tower

(b) highest point of the landing area

(c) lowest point of the landing area

(d) none of these

(ii) From the end of an instrumental runway, the approach surface rises outwards

(a) 1 in 50 (b) 1 in 30

(c) 1 in 40 (d) 1 in 80

(iii) If the width of the approach area near the runway end is 150 m, the width of the approach area at a distance of 3 km from runway end will be

(a) 1500 m (b) 1000 m
(c) 800 m (d) 1200 m

(iv) The lift off distance is the distance along the centre of the runway between the starting point and
(a) end of the runway
(b) end of the stop way
(c) point where aircraft become air borne
(d) point where aircraft attains a height of 10.7m

(v) The metrological condition which influences the size and location of an airport is
(a) atmosphere pressure (b) wind direction
(c) reduced level (d) all the above

(vi) The length of runway is increased per 300 m rise above mean sea level
(a) 3% (b) 7%
(c) 4% (d) 6%

(vii) For the taxiway the permissible rate of change of grade is
(a) 1% (b) 5%
(c) 3% (d) 0.5%

(viii) Taxiway lighting colour is
(a) red (b) green
(c) blue (d) white

(ix) The pilot normally takes decision about landing when he is about
(a) 100 m (b) 60 m
(c) 40 m (d) 20 m





(x) The air speed of aircraft is 600 kmph. If there is head wind of 50 kmph the aircraft is flying at a speed of
(a) 600 kmph (b) 550 kmph
(c) 50 kmph (d) 650 kmph

2. (a) What do you mean by airport master plan? What are the objectives of airport master plan? 7
(b) Explain the various surveys to be conducted and the data to be collected for airport site selection. 7

3. (a) What are the imaginary surfaces? What is their significance? 7
(b) Explain with the aid of neat sketches the shape of each surface for domestic airport. 7

4. (a) What do you mean by Runway number and Runway configuration? Find the runway number when the bearing of an alignment is 120°. 7
(b) How the runway orientation is selected? State and explain the terms, Cross wind component and wind coverage. 7

5. (a) What do you understand by the term basic runway length? Explain the procedure of determining the actual runway length required at a particular site. 7
(b) Discuss the factors that affect the airport operating capacity. 7

6. The length of a runway under standard condition is 2100 m. the airport is to be provided at elevation of 410 m above the mean sea level. The airport reference temperature is