[5927]-339

B.E. (Civil)

AIRPORT AND BRIDGE ENGINEERING

(2019 Pattern) (Semester - VII) (401004D) (Elective - IV)

Time : 2½ Hours]   *[Max. Marks : 70*

Instructions to the candidates:

1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to right indicate full marks.*
4) *Use of electronic pocket calculator is allowed.*

Q1) a) Explain with suitable example, application of Building Information Modelling (BIM) in airport engineering. **[6]**

b) Discuss in brief Augmented Reality (AR) and Virtual Reality (VR) in airport planning and design. **[6]**

c) State and explain the factors affecting the design of Airport capacity. **[6]**

OR

Q2) a) Explain planning and design of airport pavement. **[6]**

b) State the comparison between highway and airfield pavements. **[6]**

c) Discuss in brief the necessity of airport drainage. **[6]**

Q3) a) What do you understand by the term visual aid in connection with airport? Name the different visual needs. **[6]**

b) Describe in brief the following : **[5]**

    i) Taxiway shoulder marking

    ii) Apron marking

c) Explain vertical take-off and landing (VTOL), short take-off and landing (STOL). **[6]**

Q4) a) What are the chief characteristics of the helicopter. **[6]**

b) Explain with sketch various markings on runways. **[5]**

c) How do you decide the size of the heliport area? Sketch the layout of a typical heliport for large size helicopters. **[6]**

Q5) a) Discuss briefly the characteristics of an ideal site for a bridge. **[6]**

b) The catchment area of a stream is of sandy soil with thick vegetation cover and the area of the catchment is 8000 hectares. The length of the catchment is 20 km and the fall in level from the critical point to the bridge site is 160 meters. Calculate the peak runoff for designing the bridge, if the severest storm as recorded yielded 16 cm of rain 4 hours. **[8]**

c) What is necessity of providing cut-water in a bridge pier? Sketch the various shapes of cut water. **[4]**

OR

Q6) a) How will you account for the following in the design of highway bridge : **[6]**

   i) Impact

   ii) Wind Load

   iii) Forces due to water currents

b) A bridge is proposed to be constructed across an alluvial stream carrying a discharge of 300 meter cube per second. Assuming the value of silt factor = 1.1 determine the maximum scour depth when the bridge consists of **[8]**

   i) Two spans of 35 m each

   ii) Three spans of 30 m each

c) Describe with neat sketch the any two types of wing walls indicating their suitability. **[4]**

Q7) a) Distinguish between : **[6]**

   i) Culvert

   ii) Causeway and Submersible bridge

b) Compare the salient features of Simply supported, continuous and cantilever bridges. **[6]**

c) State precisely the purpose of providing bearings in bridges. Name the various types of bearings. **[5]**

OR

Q8) a) What is culvert? State and explain any two types of culverts. **[6]**

b) Explain with neat sketch the following : **[6]**

   i) Bascule bridge

   ii) Lift bridge

   iii) Transporter bridge

c) State the requirements of an ideal bridge bearings. **[5]**

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