Hall Ticket Number :										

Code: 4G673

R-14

IV B.Tech. I Semester Supplementary Examinations May 2018

Bridge Engineering

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. Explain the steps involved in the design of railway bridges in detail. 14M

OR

2. Design a reinforced concrete box culvert with inside dimensions of 3.75m wide and 2.5 m deep.. The box culvert has to carry a super imposed load of 10 kN/m^2 and a live load of 40 kN/m^2 . The density of the earth is 16 kN / m^3. Angle of repose of soil is 30 degrees. Adopt M20 grade concrete and Fe-415 grade for steel. 14M

UNIT–II

3. Discuss the applications of Pigeauds curves in the design of bridges. 14M

OR

4. Explain the steps involved in the analysis and design of a T- beam bridge with class AA tracked vehicle loading system in detail. 14M

UNIT–III

5. Explain the steps involved in the design of welded plate girder bridges in detail. 14M

OR

6. Design a single span composite steel girder and a RCC deck slab bridge is proposed for a state high way across a stream. Span of the bridge is 16m. width of road is 6m. RCC deck slab is supported by 5 numbers of rolled steel joists placed longitudinally, symmetrically.. Adopt equivalent live load 1200 kg/m^2,and impact factor 0.5.Use M25 grade concrete and Fe 415 steel. 14M

UNIT–IV

7. Explain the design principles of steel rocker bearing and roller bearings. 14M

OR

8. Design an elastomeric pad bearing to support a T- beam girder of a bridge using the following data. Maximum dead load reaction per bearing=300 kN, Maximum live load reaction per bearing=700 kN, longitudinal force due to friction per bearing=45 kN, effective span of the girder=16m, estimated rotation at bearing of the girder due to dead and live loads = 0.002 radians. Concrete for T- beam and bed block=M20, Total estimated shear strain due to creep, shrinkage and temperature=6 x 10^{-4}. 14M

UNIT–V

9. Explain various types of bridge foundations with neat sketches. 14M

OR

10. Verify the adequacy of the dimensions for a pier of top width 1.6m, height 10m, C/C of bearings on either side 1.00m, side batter 1 in 12, HFL 1m below the bearing level, span of the bridge 16m, loading on span IRC class AA, two lane road with 1m wide foot path on either side. Super structure consists of three longitudinal girders of 1.4m depth with a deck slab of 200mm depth. Rib width of girders 300mm. Adopt M25 grade concrete for the pier. 14M

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Hall Ticket Number :										

Code: 4G674

R-14

IV B.Tech. I Semester Supplementary Examinations May 2018

Concrete Technology

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Explain any two test of ordinary Portland cement? 8M
   b) Explain type of aggregates in brief? 6M

OR

2. a) What do you understand by batching? How does it affect quantity of sand of volume batching? 7M
   b) Explain pozzolanic action? Also write use of OPC-43 grade in India 7M

UNIT–II

3. a) Explain compacting factor, slump test of workability? 8M
   b) Explain mixing of concrete and different type of mixing? 6M

OR

4. Explain creep and efflorescence of concrete and its effects on strength of concrete? What do you understand split tensile strength test of concrete? Also explain curing of concrete? 14M

UNIT–III

5. a) Discuss flexural tensile strength test of concrete? 7M
   b) Describe in brief the ultrasonic pulse velocity test of concrete? 7M

OR

6. a) Describe shrinkage of concrete and factors its effect on concrete? 6M
   b) Write short notes on Modulus of elasticity of concrete? 8M

UNIT–IV

7. a) What do you understand by target mean strength and find target mean strength of M15? 8M
   b) Explain the term durability and various factors affecting durability of concrete? 6M

OR

8. a) Discuss quality control of concrete in mix design? 7M
   b) Write the recommendation and guidance of mix design as per IS 10262:1982? 7M

UNIT–V

9. a) Discuss light weight aggregate concrete? 7M
   b) Explain polymer concrete with examples? 7M

OR

10. a) Discuses self-healing concrete? 7M
    b) Write short note on cellular concrete? 7M

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Hall Ticket Number :										

Code: 4G67C

R-14

IV B.Tech. I Semester Supplementary Examinations May 2018

Construction Technology and Project Management

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Explain with a neat sketch, a financial schedule showing expenditure, receipts and working capital. 7M
   b) Write a short note on prefabrication in construction. 7M

OR

2. a) List out the various construction processes carried out a site. 7M
   b) Differentiate between confined excavation and sloped excavation. 7M

UNIT–II

3. a) Write about the classification of soils. 7M
   b) What do you understand by trenchless technology? 7M

OR

4. a) Briefly explain the excavation process through rocky soil structure. 7M
   b) How do you control ground water flow? Discuss various methods to control with neat sketches. 7M

UNIT–III

5. a) What are the techniques that are used to analyze the alternatives in operations research? Briefly explain. 7M
   b) What is the importance of development of bar chart? Also discuss the short comings of bar charts and remedial measures to be followed. 7M

OR

6. What are the various modes of network construction? Also list out the steps in the development of a network. 14M

UNIT–IV

7. a) Explain the term ‘work breakdown’ structure and its necessity. 7M
   b) What are the steps involved in the development of a network. 7M

OR

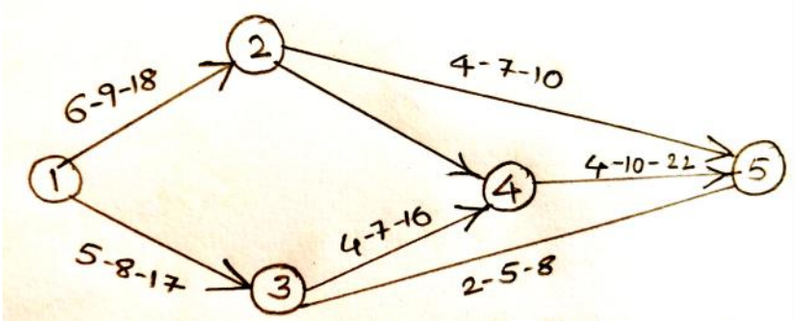
8. a) Define the terms. I) Event ii) Activity, iii) Dummy activity and iv) Network. 10M
   b) Differentiate between direct cost and indirect cost. 4M

UNIT–V

9. a) Differentiate between PERT and CPM. 6M
   b) Define the terms.
      a) Mean
      b) variance
      c) standard deviation and
      d) time estimates. 8M

OR

10. A network for construction project is shown below. The three time estimates for each activity are given along each activity arrow. Compute
    a) Expected time of completion of each activity.
    b) Earliest expected time of each event.
    c) Latest allowable occurrence time of each event.



14M

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Hall Ticket Number :										

Code: 4G672

R-14

IV B.Tech. I Semester Supplementary Examinations May 2018

Finite Element Methods in Civil Engineering

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Explain the basic steps involved in FEM with the help of an example. 7M

   b) If a displacement field is described by $u = (-x^2 + 2y^2 + 4xy)\ 10^{-4}$ and $v = (3x + 6y - 2y^2)\ 10^{-4}$. Determine $€_x$, $€_y$ and $€_{xy}$ at the point x=2, y=0. 7M

OR

2. a) Derive the maximum deflection for a simply supported beam subjected to u.d.l. throughout the span and a centre point load using Rayleigh-Ritz method of functional approximation 7M

   b) What are Plane stress and Axi-symmetric stress conditions? Explain and write the constitutive relations. 7M

UNIT–II

3. a) Derive the shape functions for a 4-noded rectangular element. 7M

   b) What is Natural co-ordinate system? Explain linear and Area co-ordinate systems. 7M

OR

4. Derive the strain displacement matrix, stiffness matrix and nodal load vectors for a 3 noded 1-D element. 14M

UNIT–III

5. What principle is used in deriving the element stiffness matrix for a general 3-D element? Derive the element stiffness matrix and nodal vectors for a general 3-D element. 14M

OR

6. Derive the stain displacement matrix , stiffness matrix and nodal load vectors for a 2-D CST element. 14M

UNIT–IV

7. Derive the Jacobian matrix, strain displacement matrix and stiffness matrix for a 2-D 8-noded Iso-parametric quadrilateral element. 14M

OR

8. a) What is Lagrangian equation? Write the Lagrangian equation to find the shape functions of 1-D and 2-D elements. 7M

   b) Explain how to calculate the shape functions of 3-noded 1-D element and 2-D 4-noded rectangular element using lagrangian equation. 7M

UNIT–V

9. a) Explain the two-dimensional Gauss rules for numerical integration. 7M

   b) Explain Static condensation in FEM. 7M

OR

10. a) Explain one-dimensional Gauss rules for numerical integration. 7M

    b) Explain the solution techniques for Static loads. 7M

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Hall Ticket Number :										

Code: 4G671

R-14

IV B.Tech. I Semester Supplementary Examinations May 2018

Geotechnical Engineering II

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer all five units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) How the soil explorations are done by boring? What are the various types of borings used in soil exploration? Briefly describe auger boring. 7M

   b) Define the following terms regarding soil sampler, (i) area ratio (ii) inside clearance (iii) outside clearance. 7M

OR

2. a) What are the significance of plate load test and standard penetration test in soil engineering? 7M

   b) Briefly explain the various types of samplers used in soil exploration. 7M

UNIT–II

3. a) Find the expression of coefficient of active earth pressure, when the backfill is horizontal and soil is cohessionless. 7M

   b) What are the various types of failure in finite slopes? 7M

OR

4. Briefly Compare the coulomb theory and the rankine theory of earth pressure. 14M

UNIT–III

5. Determine the diameter of a circular footing to carry a concentric load of 825kN. The depth of footing is 1.5 m. the soil is partly saturated and has c= 55 kN/m2 and γ= 19 kN/m3. FOS=3. Use Terzaghi analysis and to neglect the weight of footing. 14M

OR

6. A retaining wall 10m height retains a cohessionless soil having an angle of internal friction of 30^0. The surface of the soil is level with the top of the wall. The top 3m of the fill has a unit weight of 20kN/m3 and that of the rest is 30kN/m3. Find the magnitude per meter run and point of application of the resultant active thrust. Assume ϕ is the same for both strata. 14M

UNIT–IV

7. a) A plate load test was conducted on a sandy soil with the plate of size 0.3m x 0.3m. The ultimate load per unit area was found to be 2.0 kg/cm^2. Calculate the allowable load for a footing of size 2m x 2m. use FOS=3 7M

   b) Write the major stages of plate load test for determination of bearing capacity of soil. 7M

OR

8. a) What are the various factors affecting the bearing capacity of a soil? 7M

   b) Briefly explain the following types of failure in soil (i) General shear failure
   (ii) Local shear failure 7M

UNIT–V

9. a) What is the necessity for pile foundation? Classify the piles based on their function. 7M

   b) What do you understand by sinking of wells? 7M

OR

10. a) Briefly explain the various components of a well foundation with the help of neat sketch. 7M

    b) A 30 cm diameter concrete pile is driven in a normally consolidated clay deposit 15 m thick. Estimate the safe load. Take C_u=70kN/m2, α=0.9 and FOS=2.5 7M

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Hall Ticket Number :										

Code: 4G676

R-14

IV B.Tech. I Semester Supplementary Examinations May 2018

Railway Docks and Harbor Engineering

(Civil Engineering)

Max. Marks: 70 Time: 3 Hours

Answer *all five* units by choosing one question from each unit (5 x 14 = 70 Marks)

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UNIT–I

1. a) Explain the functions and requirements of good ballast used in laying the railway track. 7M

   b) Define "Creep of Rails." Explain the theories related to creep. 7M

OR

2. a) Define and derive the degree of curve in railways. 8M

   b) Illustrate the Left hand turn out neatly with a figure, clearly depicting all its components. 6M

UNIT–II

3. a) Define a station yard. Explain the types of station yards. 7M

   b) Explain the necessities and functions of interlocking. 7M

OR

4. Explain in detail about drainage and ventilation of tunnels. 14M

UNIT–III

5. a) Write an explanatory note on the following.
   (i) Greek Harbours.
   (ii) Roman Hrabours. 8M

   b) What is a dry dock? Identify the applications of dry dock. 6M

OR

6. Why the name "breakwaters"? Explain in detail about breakwaters. 14M

UNIT–IV

7. a) Distinguish between a jetty and wharf 6M

   b) Write a note on different types of jetties. 8M

OR

8. a) Discuss about the importance of Landing stages and wharves in Docks and harbours. 7M

   b) Write short notes on the following;
   (i) Wharves
   (ii) Dolphins 7M

UNIT–V

9. a) Describe the features of Mechanical dredgers and Hydraulic dredgers used in dredging operation. 7M

   b) Explain about the different types of shore protection works? 7M

OR

10. a) Give information about Maintenance of buildings in Docks and Harbours 7M

    b) How do you maintain Lock gates and Caissons in Docks and Harbours 7M

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