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R-11/R-13

Code: 1G671

IV B.Tech. I Semester Regular & Supplementary Examinations Nov 2016

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)

1. Describe open excavation methods of exploration? What are the factors that affect the sample disturbance?
2. How a slope is analysed using 'standard method of slices'. Derive an expression for the factor of safety.
3. What are the assumptions in coulomb's theory? Compare Rankine's theory with coulomb's theory.
4. What are the different types of retaining walls? What are the basic principles of the design of retaining walls?
5. Write short notes on
 - a) Mayerhoff's bearing capacity theory
 - b) Skempton's analysis.
6. Describe 'plate load test' and explain the limitations of the test.
7. How do you estimate the group capacity of piles in
 - a) sand
 - b) Clay.
8. Describe the various methods for the design of well foundation. What are their relative merits and de merits?

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II B.Tech. I Semester Regular Examinations November 2016

Finite Element Methods in Civil Engineering

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions.

All Questions carry equal marks (14 Marks each)

1. Justify the need of Discretization of structure. During discretization, mention the places where it is necessary to place a node? 14M
2. a) What are axisymmetric elements? Give examples. 6M
b) Discuss the advantages and disadvantages of finite element method over conventional methods. 8M
3. Find the displacements and reaction forces for the Fig.1 given below. Assume $E = 2 \times 10^5 \text{ N/mm}^2$.

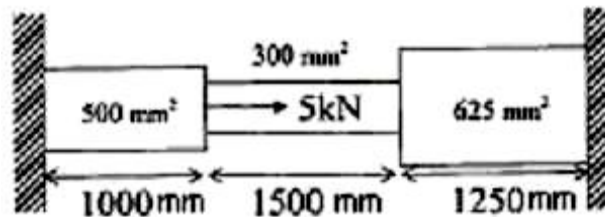


Fig.1

14M

4. a) List out the compatibility and convergence criteria for displacement variables 7M
b) Define plane stress and plane strain condition with examples 7M
5. Derive the strain displacement matrix for three noded triangular element 14M
6. a) Discuss about Lagrange's and serendipity elements. 5M
b) State the basic theorems of Isoparametric elements. Define subparametric and superparametric elements. 9M
7. Explain the finite element modeling of axisymmetric solids subjected to axisymmetric loading 14M
8. Evaluate the following integral using one, two and three point gauss Quadrature.

$$I = \int_0^1 \left(e^x - \frac{2x}{x^2 - 2} \right) dx$$

14M

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IV B.Tech. I Semester Regular and Supplementary Examinations November 2016

Bridge Engineering

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All questions carry equal marks (**14 Marks** each)

1. a) Explain IRC loading standards for Highway bridges. 7M
b) What is meant by Economical span? Derive the condition for economical span mentioning the assumptions made in the derivation. 7M
2. Design a reinforced concrete slab culvert for a national highway to suit the following data:
Carriage way= 7.5m wide
Clear Span = 7m
Wearing coat=100mm
Width of bearing = 0.4m
Use M25 grade concrete and Fe415 steel. Design the RC deck slab for IRC class AA loading and sketch the reinforcement details in longitudinal and cross section. 14M
3. A reinforced concrete simply supported slab is required for the deck of a road bridge having the following data:
clear span = 5.5 m. width of carriage way = 7.5 m.
foot path on either side = 1m. wide. Materials = M20 grade concrete and Fe 415 steel.
Type of loading IRC class AA. Design the deck slab. Show the reinforcement details. 14M
4. Design an Interior panel and Cantilever of R.C.C T-Beam deck slab bridge for two lane highway with following data
Span of the Bridge=25 m Foot path on either side=1.5 m wide
Width of carriage way=7.5 m Spacing of longitudinal Girders=3.3 m (3 No's)
Spacing of cross Girders= 3.0 m Thickness of wearing coat=75 mm
Loading-IRC Class AA Tracked vehicle Material-M30 and Fe 500
Use $m_1=0.055$ and $m_2=0.021$, Sketch the details of reinforcement. 14M
5. Design the Plate girder bridge to conform to the IRC loadings and IRC specifications with following data:
Effective span of the girder = 40m
Dead load of the track (open floor) = 7.5 KN/m
EULL for bending moment calculations/track = 3498 KN
EULL for Shear force calculations/track = 3815 KN
Impact factor =0.324 Wind load = 1.5 KN/m² Racking forces = 6 KN/m² 14M
6. a) Write short notes on Shear connectors in composite Bridges. 7M
b) Discuss in detail where Composite bridges are preferred and salient advantages of these bridges over conventional bridges. 7M
7. a) Explain with neat sketches various types of Bridges bearings 4M
b) Design an elastometric bearing at the sliding end of a bridge for the following data. Maximum Normal load 1000 KN, Minimum-normal load 200 KN, Transverse lateral load 40 KN, Longitudinal load 60 KN, Total longitudinal translation 15 mm, Rotation at support 0.0025 radians. Shear modulus of elastometric bearing = 1.2 N/mm². Allowable compressive stress for concrete = 7 N/mm². Allowable compressive stress for elastomer = 10 N/mm². 10M
8. a) What are the various types of Piers? What are the various forces, which are considered in the design of Piers? 7M
b) What is the function of the Wing wall and how can you classify the wing walls? 7M

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IV B.Tech. I Semester Regular & Supplementary Examinations Nov 2016

Concrete Technology

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

1. Describe how soundness and specific gravity of cement are determined in the laboratory? 14M
2. What is bulking of sand? How it is determined? Describe how specific gravity of fine aggregate is determined in the laboratory. 14M
3. Discuss about the various factors that affect workability. Describe how compaction factor test is conducted on fresh concrete in the laboratory. 14M
4. What is Abram's law? What is the importance of water/cement ratio in concrete? How water/cement ratio affects the strength of hardened concrete? 14M
5. What are the different factors that affect strength of concrete? Explain how flexural strength of concrete is determined? 14M
6. Discuss about the effects of shrinkage of concrete. Write the factors which influence the shrinkage of concrete. 14M
7. Identify the factors that have influence on durability of concrete? Discuss briefly about IS code method of concrete mix proportioning. 14M
8. Write short notes on polymer concrete and no fines concrete. 14M

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IV B.Tech. I Semester Regular & Supplementary Examinations Nov 2016

Railway Docks and Harbor Engineering

(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

Answer any **five** questions

All Questions carry equal marks (**14 Marks** each)

1. a) What are the functions of rails in a permanent way? What are the requirements of good rails to satisfy the expected functions? 8M
b) Define "Creep of Rails". What are the theories proposed for causes of creep? 6M
2. a) Discuss about the types of gradients used in railway alignment. 8M
b) A 6° branch line takes off from a 3° main line in the layout of a BG yard. If the speed on the branch line is limited to 38 kmph, determine the speed restriction on main line. Take cant deficiency permitted as 7.62 cm. 6M
3. a) What factors are to be given consideration while selecting a site for a railway station? Discuss. 6M
b) Give the classification of signals used in railway operations. Describe the working principle of a semaphore signal. 8M
4. a) How do you differentiate between "Underground Railways" and "Tube Railways"? Mention the advantages of using underground railways for Mass Transportation in a metropolitan area. 8M
b) How the ventilation and drainage are provided in tunnels? 6M
5. Describe the features of Cretan Harbours, Greek Harbours and Phasor harbours bringing out their historic prominence. 14M
6. a) Give the classification of harbours. Support your answer with neat sketches. 8M
b) What are the factors to be considered in the design and construction of Dock walls? 6M
7. a) Write a note on different types of jetties. 8M
b) Discuss about the importance of Landing stages and wharves in Docks and harbours. 6M
8. a) What are the types of dredgers used in dredging operation? What are their features? 8M
b) What are the various types of maintenance works needed in a harbor? 6M

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IV B.Tech. I Semester Regular & Supplementary Examinations Nov 2016

Construction Technology and Project Management
(Civil Engineering)

Max. Marks: 70

Time: 3 Hours

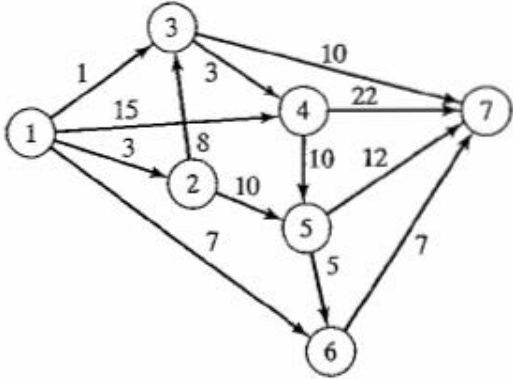
Answer any **five** questions
All Questions carry equal marks (14 Marks each)

1. Discuss about various construction activities and construction processes in detail. 14M
2. a) Describe various mechanized construction equipment available in construction industry. 7M
b) What are the techniques in prefabrication? 7M
3. Briefly, explain about the classification of soils. What do you mean by trenchless technology? 14M
4. What are the different kinds of drilling? Give the steps for selection of drilling method and equipment 14M
5. Explain in detail about the programming methods in project planning. How do you overcome the problems of scheduling the projects? 14M
6. A project consists of eight activities M,N,O,P,Q,R and S and T. Draw the network and number of events if
 - i) Activities M, N, and Q can start concurrently.
 - ii) Activities O and P are concurrent and depend on the completion of both M and N
 - iii) Activities R and S are concurrent and depend on the completion of O
 - iv) Activity T depend on the completion of P, Q and R
 - v) The project is complete when S and T are done 14M
7. The time estimates for three activities A, B and C are as follows. Determine expected time and variance for each activity. Which activity has more reliable time estimates?

	Optimistic time	Most likely time	Pessimistic time
A	19	26	35
B	17	27	40
C	18	28	36

14M

8. For the network given below, compute E and L for each event and determine the total, free, independent and interfering floats and also identify the critical path.



14M
