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B.E. (Civil) (Part - II) (Semester - VIII)
Examination, May - 2019
WATER RESOURCES ENGINEERING - II
Sub. Code: 67749

Day and Date : Thursday, 16-05-2019

Total Marks : 100

Time : 10.00 a.m. to 1.00 p.m.

- Instructions : 1) Attempt any three questions from each section.
 2) Figure to the right indicate full marks.

SECTION - I

Q1) a) Draw a neat sketch showing various storage zones/control levels in a reservoir as given below. [4]

- | | |
|-----------------|-------------------|
| i) F.R.L | ii) M.D.D.L |
| iii) H.F.L | iv) Dead storage |
| v) Live storage | vi) Surge storage |

b) Write the definitions and importance of following terms : [5]

- | | |
|--------------------|--------------------|
| i) Dead storage | ii) Live storage |
| iii) Surge storage | iv) Valley Storage |
| v) Bank Storage | |

c) Enlist the various factors that govern the selection of type of dam at a site. In Particular explain how the following conditions affect the choice of dam. [8]

- i) Topography
- ii) Foundation condition
- iii) Material of construction

Q2) a) Explain the procedure to locate phreatic line for an earth dam with homogenous dam section and horizontal drainage filter at downstream end. [6]



P.T.O.

- b) It is required to find the factor of safety, of downstream slope of a homogenous earth dam, in steady seepage condition. For this, the section of dam was drawn to a scale of, 1 cm = 10 m. ; and the following results were obtained on a trial slip circle. [6]

- i) Area of N - diagram = 12.15 sq. cm.
- ii) Area of T - diagram = 6.50 sq. cm.
- iii) Area of U - diagram = 4.20 sq. cm.
- iv) Length of arc = 11.60 cm.

The dam material has following properties:

- i) Effective angle of internal friction = 26°
- ii) Unit value of cohesion = 20 kN/m^2
- iii) Unit weight of soil = 20 kN/m^3

Determine the factor of safety for d/s slope.

- c) Draw a neat section of an earth dam for the following site. [5]
- i) Both silty clay and coarse sand are available at site. Hard stratum is available at 5m below the natural ground.
 - ii) The depth of water on upstream side is 18m.

Show all the components. Assume suitable data not given. Give reasons for the same.

- b) a) What do you understand by the elementary profile and practical profile of a gravity dam? Show the difference between the two with neat sketches and proper dimensions. [4]
- b) Derive expression for determining the base width of elementary profile based on [6]
- i) Stress Criteria
 - ii) Sliding Criteria
- c) Write a short note on various types of joints provided in gravity dams. [6]

- f) Write short notes on any four of following :

[4 × 4 = 16]

- a) Density currents and trap efficiency
- b) Steel Dams
- c) Timber Dams
- d) Drainage galleries for gravity dams
- e) Energy dissipation arrangements below ogee spillways
- f) Vertical gates for spillways.

SECTION - II

- 5) a) What is Barrage? How does it differ from weir? Describe with neat sketches types of weir. [8]
- b) Write a briefly note on Khosala's theory of design of weirs on permeable foundation. [8]
- 6) a) Classify different types of canals. Describe briefly the various considerations made in the alignment of a canal. Comment on economics of canal lining. [8]
- b) Design an irrigation canal to carry a discharge of 14 cumecs. Assume $N = 0.0225$, $m = 1$, $B/D = 5.7$ [8]
- 7) a) Describe the function of Guide bank further explain following design criteria. [8]
- i) Length of water way ii) Length of guide bank
iii) Radius of curved heads iv) Cross section.
- b) Draw a layout of hydropower plants and explain with neat sketch function of intake, Conveyance system, surge tank, power house. [8]
- 8) Write short notes on any three. [18]
- a) Bligh's creep theory
b) Types of C.D. works
c) Groyen -function & classification
d) Interlinking of rivers.
e) Canals-Lacey's silt theory.



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**B.E. (Civil Engineering) (Semester - VIII) Examination,
May - 2019**

DESIGN OF CONCRETE STRUCTURES - II (New)

Sub. Code : 67748

Day and Date : Tuesday, 14 - 05 - 2019

Total Marks : 100

Time : 10.00 a.m. to 01.00 p.m.

- Instructions :**
- 1) Attempt all questions from section I and II.
 - 2) Figures to the right indicates full marks.
 - 3) Assume any suitable data whenever necessary
 - 4) Use of non-programmable calculator and relevant I.S. 456:2000 are allowed.

SECTION - I

Q1) Design a RCC beam 300mm wide 500mm overall depth is subjected to factored B.M. of 65kN-m, factored torsional moment of 40kN-m and factored S.F. of 70kN/m. Design the beam for torsional reinforcement using LSM. Use M20 and Fe415. [17]

Q2) A reinforced concrete beam continuous over two equal spans of length 6m each. It is simply supported at its ends. It carries a uniformly distributed load of 15kN/m inclusive of its own weight over its entire length of 12m. Design for flexure and shear a suitable rectangular section for the beam. Adopt M15 concrete and Grade-I mild steel. [17]

Q3) Design circular water tank to hold 550000 liters of waters. Depth of water is 4.5m. The joint between floor and wall of the tank is to be rigid. Use M20 grade of concrete. Adopt IS code method. M20 concrete and Fe 250 steel. [16]

OR

- a) Derive an expression for moment of resistance of singly reinforced balanced section as per working stress method. [8]
- b) Explain the design procedure of circular water tank resting on ground with flexible base. [8]

P.T.O



SECTION - II

Q4) a) Explain in detail different types of prestressing. [6]

OR

- a) Why high strength steel and high strength concrete is required for prestressing.
- b) A prestressed concrete beam section of $450 \text{ mm} \times 500 \text{ mm}$ is used as simply supported beam over an effective span of 10 m. The prestressing force of 750 kN is applied with an eccentricity of 80 mm at mid span section. If the permissible stress in the concrete are 15 N/mm^2 in compression and 1 N/mm^2 in tension, estimate the udl that beam can carry in addition to its self weight. [11]

Q5) a) Explain Merits and Demerits of prestressed concrete. [6]

OR

- a) Explain in detail all the three concepts used for analysis of prestressed concrete section.
- b) A prestressed concrete beam of 10 m span, having section $100 \text{ mm} \times 300 \text{ mm}$ is prestressed by a parabolic cable profile with an eccentricity of 50 mm above the centroid of the section at the support and 100 mm below the centroid of the section at the mid span. If the cable is tensioned from one end only, estimate the percentage loss of prestress in the cable due to the effect of friction. [11]

Assume Coefficient of friction in curve $= 0.35/\text{rad}$. and
Friction coefficient for wave effect $= 0.0015/\text{m}$.

Q6) A rectangular prestressed concrete beam support a dead load moment of 15 kNm including its own weight and a live load moment of 40 kNm at its mid span. Determine the initial prestressing force and its eccentricity at the mid span section. [16]

Take the following values.

- a) Allowable initial compressive stress in concrete - 17 N/mm^2
- b) Allowable final compressive stress in concrete - 14 N/mm^2
- c) Allowable initial and final tensile stress in concrete - 1 N/mm^2
- d) Permissible tensile stress in steel - 1000 N/mm^2
- e) Assume loss of prestress - 15 %



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B.E. (Civil) (Part - II) (Semester - VIII) (New)
Examination, May - 2019
TRANSPORTATION ENGINEERING-II
Sub. Code : 67750

Day and Date : Monday, 20 - 05 - 2019

Total Marks : 100

Time : 10.00 a.m. to 1.00 p.m.

- Instructions :
- 1) Solve any Three questions from each section.
 - 2) Figures to the right indicate full marks.
 - 3) Make assumptions wherever necessary.

SECTION - I

- Q1) a)** Explain principles of Town planning in brief. [8]
b) Discuss zoning is an effective tool for Controlling development in Urban area. [8]
- Q2) a)** Explain the Landscape Architecture concept. [8]
b) Explain Land Acquisition Act and procedure of acquisition. [8]
- Q3) a)** State the necessity of village planning. [8]
b) Define Slum and explain effects of Slum on Town Life. [8]
- Q4) Short note (Any Three):** [18]
 a) Urban Renewal projects
 b) Town aesthetics
 c) MRTD-Act-Development Plan
 d) Necessity & Types of Recreational Facilities



P.T.O.

SECTION - II

Q5) a) Enlist the necessity of geometric Design of track. [8]

b) State object of Signalling & Enlist advantages of Automatic Signalling. [8]

Q6) a) Define points & Crossing & Draw sketch of Right-hand turnout. [8]

b) Define & Enlist Types of station yard, Explain any one. [8]

Q7) a) Explain with neat sketch-pipe Culvert & Box Culvert. [8]

b) Define & Enlist the purpose of Bridge Bearing. [8]

Q8) Short note (Any Three): [18]

a) Classification of Bridges

b) Necessity & Type of track maintenance

c) Loads acting on a Bridges

d) Importance of Bridge maintenance



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B.E. (Civil Engineering)
(Semester - VIII) Examination, May - 2019
STRUCTURAL DESIGN OF FOUNDATION AND
RETAINING STRUCTURES (Elective-II)
Sub. Code : 67753

Day and Date : Wednesday, 22 - 05 - 2019
 Time : 10.00 a.m. to 1.00 p.m.

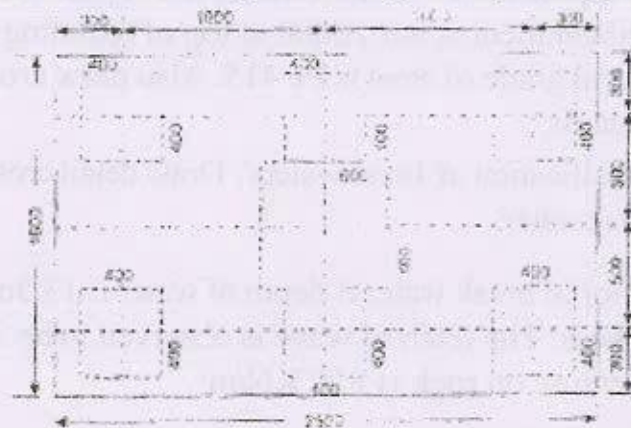
Total Marks : 100

- Instructions :
- 1) Solve any two questions from each section.
 - 2) Figures to the right indicate full marks.
 - 3) Use of IS 456-2000 is allowed.
 - 4) Assume suitable data if necessary and mention it clearly.
 - 5) Use of non-programmable calculator is allowed.

SECTION - I

Q1) Two columns 5m apart between centres carry loads of 1600kN and 2400kN respectively. The sizes of columns are 600mm × 600mm and 750mm × 750mm. Design a combined footing for the columns. The projections beyond the centres of the columns parallel to the length of the footing are limited to 0.8m and 1.4m respectively. Approximate weight of the footing may be taken as 320kN. The safe bearing capacity of the soil is 300kN/m². Use M20 concrete and Fe 415 steel. [25]

Q2) a) A column 600mm × 600mm in section carries a load of 3600kN. The column is to be supported on a pile cap which has to stand on 6 piles arranged as shown in figure. Design the pile cap. Use M20 and Fe415 steel. [15]

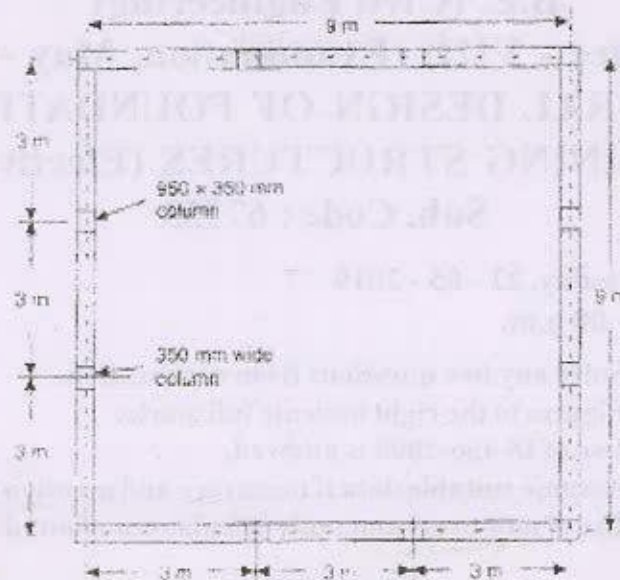


b) Explain in detail group action of piles and derive the necessary formula. [10]



P.T.O.

- Q3)** Design a raft foundation supporting the columns of a building as shown in figure. The load on each column is 400 kN. Use M20 concrete and Fe 415 steel. Safe bearing capacity of the soil is 120 N/m^2 . [25]



SECTION - II

- Q4) a)** What is well foundation? Write in detail about applications of well foundation. [12]
- b)** What is tilt and shift of well foundation? Also explain what are the various measures taken for rectification of tilt and shift of well foundation. [13]
- Q5)** Design heel, toe and stem slab for a cantilever retaining wall. The stem of wall is 4.8m high above ground level. The wall retains soil up to its top. The specific weight of soil is 19 kN/m^3 and having soil bearing capacity 180 kN/m^2 . The angle of repose is 30° . Coefficient of friction between soil and concrete is 0.58. Soil embankment is horizontal at top of retaining wall. Use grade of concrete is M_{20} and grade of steel is Fe 415. Also draw cross section showing reinforcement details. [25]
- Q6) a)** Explain classification of breakwaters? Draw detail cross section of vertical type of breakwater. [12]
- b)** Design armor of break water if depth of water is 13.5m and wind velocity is 150 Km/hour. The fetch of wave is observed to be 210 Km. Allowable bearing pressure on rock is 810 kN/m^2 . [13]

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Total No. of Pages : 2

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B.E. (Civil) (Part - IV) (Semester - VIII) (Revised)

Examination, May - 2019

ADVANCED CONSTRUCTION TECHNIQUE (Elective - III)

Sub. Code: 67764

Day and Date : Friday, 24- 05 - 2019

Total Marks : 100

Time : 10.00 a.m. to 1.00 p.m.

- Instructions :
- 1) Solve any three questions from each section
 - 2) Figures to the right indicate full marks.
 - 3) Make assumptions wherever necessary.

SECTION - I

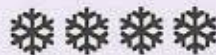
- Q1) a) Explain types of formwork, Causes of failure, and requirements of good formwork [8]
b) Explain FRC with advantages & State application of FRC [8]
- Q2) a) Explain Adhesive and types of adhesives. [8]
b) Enlist advantages & Disadvantages of MDF. [8]
- Q3) a) Define Geosynthetic & Advantages. [8]
b) What is Land Reclamation. State the methods of Land Reclamation. [8]
- Q4) Short Note (Any Three) [18]
a) Epoxy Resines - applications
b) Polymer Composites
c) Geosynthetics - Area of Application - Explain any one
d) Enlist the different factors influence the cost of formwork.



P.T.O.

SECTION - II

- Q5) a) State the Importance of Nuclear Power Station. [8]
b) Explain with neat sketch how wind mill works. [8]
- Q6) a) Explain Thermal Power Station with sketch [8]
b) Explain the necessity of Bridge Rehabilitation [8]
- Q7) a) What is Foundation Jacketing. [8]
b) Explain with neat sketch the vacuum dewatering [8]
- Q8) Short Note (Any Three) [18]
a) Methods of Bridge rehabilitation with sketch
b) Roller Compacted Concrete
c) Slip Formwork
d) Importance of Strengthening of Isolated Footing with sketch.



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B.E. (Civil Engineering) (Semester - VII)

(New) Examination, May - 2019

ADVANCED FOUNDATION ENGINEERING (Elective-I)

Sub. Code :67564

Day and Date :Thursday, 09- 05 - 2019.

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :
- 1) All questions are compulsory.
 - 2) Figure to the right indicates full marks.
 - 3) Use of non-programmable calculator and relevant I.S. Codes is allowed.
 - 4) Assume suitable data if required and mention it clearly.

SECTION-I

- Q1) a) Write note on following. [8]**
- i) Immediate settlement
 - ii) Consolidation Settlement.
- b) Design trapezoidal combined footing for two columns A and B located 5m apart. The sizes of columns are 500×500 mm and 600×600 mm respectively. The loads on them are 1000 KN and 1500 KN respectively. The projection beyond the center of the column parallel to length of footing is 0.8 m and 1.5 m respectively. SBC of soil is 250KN/m². [8]**
- Q2) a) Explain types or raft foundation with diagram. [8]**
- b) A building consists of 9 columns. Each column is of size 400×400 mm. These columns are arranged in three rows of three columns in each row. Distance between the columns is 6 m in both ways. Each column at corner carries 700 KN loads, each exterior column carries 500 KN load while each interior column carries 1000 KN load. Calculate soil pressure below each column. [9]**



P.T.O.

- Q3) a) Write note on. [8]
- i) Group action of piles
 - ii) Negative skin friction
- b) A square group of 9 piles was arranged in square pattern with diameter and length of each pile as 25 cm and 10 m respectively, is used as a foundation in soft clay deposit. Taking the unconfined compressive strength of clay as 120 KN/m^2 and the pile spacing as 100 cm center, find the load capacity of group. Assume the adhesion factor is 0.75 and factor of safety 2.5. [9]

SECTION-II

- Q4) a) Assuming resonance to have occurred at the frequency of 22 cycles second in a vertical vibration of a test block, $1.0 \times 1.0 \times 1.0 \text{ m}$ size. Determine the C_u . The weight of oscillator is 62 kg and the force produced by it at 12 cycles per second is 100 kg. Also calculate maximum amplitude in vertical direction at 12 cycles/second. [9]
- b) Write in brief the design criteria for Reciprocating machines. [8]
- Q5) a) Explain design of sheet pile wall in granular and cohesive soil. [8]
- b) Explain types and uses of cofferdam with sketches. [8]
- Q6) a) Explain in detail different methods shoring and underpinning for lowering ground water table. [9]
- b) Explain in detail the problem associated with foundation installation. [8]



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B.E. (Civil Engineering)
(Semester - VIII) Examination, May - 2019
STRUCTURAL DESIGN OF FOUNDATION AND
RETAINING STRUCTURES (Elective-II)
Sub. Code : 67753

Day and Date : Wednesday, 22 - 05 - 2019
 Time : 10.00 a.m. to 1.00 p.m.

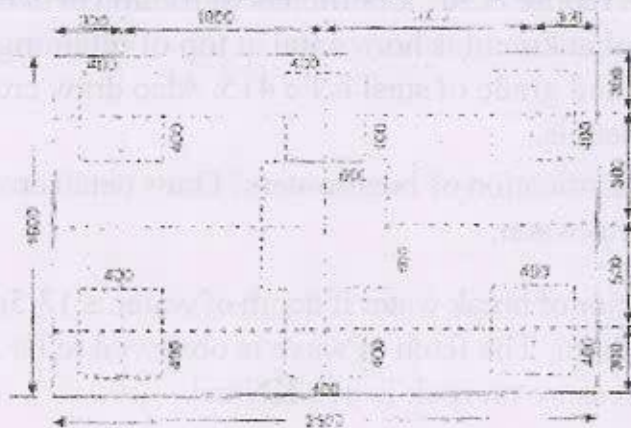
Total Marks : 100

- Instructions :
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SECTION - I

Q1) Two columns 5m apart between centres carry loads of 1600kN and 2400kN respectively. The sizes of columns are 600mm × 600mm and 750mm × 750mm. Design a combined footing for the columns. The projections beyond the centres of the columns parallel to the length of the footing are limited to 0.8m and 1.4m respectively. Approximate weight of the footing may be taken as 320kN. The safe bearing capacity of the soil is 300kN/m². Use M20 concrete and Fe 415 steel. [25]

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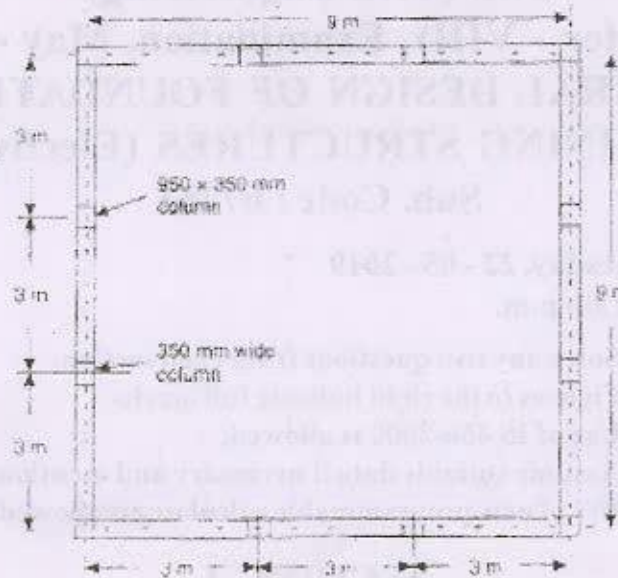


- b) Explain in detail group action of piles and derive the necessary formula. [10]



P.T.O.

- Q3) Design a raft foundation supporting the columns of a building as shown in figure. The load on each column is 400 kN. Use M20 concrete and Fe 415 steel. Safe bearing capacity of the soil is 120 N/m^2 . [25]



SECTION - II

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