Seat
No.

T.Y. B.Tech. (Civil Engineering) (Semester - V) (CBCS)
Examination, January - 2023
PCC-CV 501 : WATER RESOURCE ENGINEERING - I
Sub. Code: 80763

Day and Date: Friday, 13- 01 - 2023   Total Marks : 70
Time : 10.30 a.m. to 1.00. pm

Instructions :
1) Q4 and Q8 are compulsory. In section I attempt any two questions from Q1,Q2, and Q3 and in section II attempt any two questions from Q5, Q6 & Q7.
2) Figures to the right indicate full marks.
3) Assume suitable data, if necessary and state them clearly.
4) Answer shall be supported by adequate sketches.

SECTION-I

Q1) a) Explain with sketch non-automatic type of rain gauge. (Symon's sraingauge) **[5]**

b) The rain gauge station X was in operative for a part of a month during stormoccurred. The storm rainfall recorded at the three surrounding stations A, B, and C was 75, 55, and 85 mm respectively. If the average annual rainfall of the stations A, B, C, and X are 780, 660, 850 and 700 mm. respectively. Estimate the storm rainfall of station X. **[7]**

Q2) a) What is Infiltration? Explain factors affecting infiltration? **[5]**

b) The rate of rainfall for successive 30 min. periods of a 4h storm are as follows. **[6]**

3.5, 6.5, 8.5, 7.8, 6.4, 4.0,6 cm/h.

Taking the value of $\varnothing$ index as 4.5cm/h, compute the following

i) Total rainfall

ii) Total rainfall excess

iii) W index

Q3) a) Define various time parameters used in hydrograph analysis. **[6]**

b) The ordinates of 6 H unit hydrograph are given, calculate ordinates of 3 hours unit hydrograph. **[6]**

Time (h)	0	03	06	09	12	15	18	21	24	27	30	33	36	39	42
Ordinates cumecs	0	9	20	35	49	43	35	28	22	17	12	9	6	3	0

Q4) Solve any two.

a) Write Note On : Flood Discharge by rotional Formula. **[6]**

b) Define Term Flood Hydrograph? Explain its components. **[6]**

c) Write short Note on Principle of Superposition. **[6]**

SECTION-II

Q5) a) Explain in detail with neat sketch. **[6]**

   i) Aquifer

   ii) Aquiclude

   iii) Aquifuge

   iv) Aquitard

   v) Perched Aquifer

b) Explain in detail constructional features of open well. **[6]**

Q6) a) Explain in detail general layout, main components & functioning of Percolation tank. **[5]**

b) Explain with neat sketch working of Drip Irrigation. State its advantages and disadvantages. **[6]**

Q7) a) Explain in detail classes and availability of soil water. **[6]**

b) Explain in detail methods of improving duty. **[6]**

Q8) Solve any Two.

a) Write a detail note on confined aquifer and unconfined aquifer. **[6]**

b) Explain in detail general layout, main components & functioning of Bandara irrigation. **[6]**

c) What do you understand by consumptive use of water? **[6]**

Final Year B.Tech. (Civil Engineering) (CBCS) (Semester-VII) Examination, January - 2023
PCE-CV705 : SOLID WASTE MANAGEMENT
PROFESSIONAL ELECTIVE - I
Sub. Code: 83739

Day and Date : Monday, 16 - 01 - 2023   Total Marks : 70
Time : 10.30 a.m. to 1.00 p.m.

Instructions :   1)   Q.No.4 and Q.No.8 are compulsory of respective sections.
              2)   Attempt any two questions from Q.No.1, 2, 3 and any two questions from Q.No. 5, 6, 7.
              3)   Figures to the right indicate full marks.
              4)   Assume suitable data if necessary and state them clearly.
              5)   Answer shall be supported by adequate sketches.

SECTION-I

Q1) Answer any two of the following questions.

    a)   With help of the flow diagram, explain the functional elements of Municipal Solid Waste management.   **[5]**

    b)   Explain the importance of analysis of refuse.   **[5]**

    c)   What are the different compositions of MSW?   **[5]**

Q2) Anwer any two of the following questions.

    a)   What is solid waste generation rate and write the solid waste generation rate in India.   **[5]**

    b)   What are the different MSW collection methods? Explain any one   **[5]**

    c)   Define following Unit Operation w.r.t. HCS:-   **[5]**

        i)   Haul

        ii)   Off-route

Q3) Answer the following questions.

    a)   Write the objectives of solid waste processing systems.   **[5]**

    b)   Explain with the figure the different types of air classifiers.   **[5]**

Q3) Answer the following questions (compulsory).

    a)   Write a note on Solid Waste Management & Handling Rules.   **[5]**

    b)   Explain on site handling, sorting, storage and processing of MSW.   **[5]**

    c)   Define Transfer station and explain its necessity.   **[5]**

SECTION-II

Q5) Answer any two of the following questions.

    a)   Draw the c/s of sanitary landfill and explain the essential components. **[5]**

    b)   Explain leachate collection system with neat fig.   **[5]**

    c)   Explain the factors which affect production of leachate & landfill gas?

        [5]

Q6) Answer any two of the following questions.

    a)   What is composting? What are the benefits of composting?   **[5]**

    b)   Explain theory of composting.   **[5]**

    c)   Explain Bangalore method of Composting.   **[5]**

Q7) Answer the following questions.

    a)   Explain various elements of incineration system.   **[5]**

    b)   Explain pyrolysis and its products.   **[5]**

Q8) Answer the following questions (all compulsory).

    a)   Discuss in detail the criteria for Site Selection for MSW Landfill.   **[5]**

    b)   Explain the recovery of Biogas energy from MSW with flow diagram. **[5]**

    c)   Explain the different factors affecting incineration process.   **[5]**

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Seat No.

B.Tech (Civil Engineering) (CBCS) (Semester - VII) Examination, January - 2023
EARTHQUAKE ENGINEERING
Sub. Code : 83733

Day and Date : Friday, 20 - 01 - 2023   Total Marks: 70

Time : 02.30 p.m. to 05.00 p.m.

Instructions: 1)   All questions are compulsory.

                   2)   Figures to the right indicate full marks.

                   3)   Use of IS1893 only is permitted.

                   4)   Assume any other additional data if necessary and state it clearly.

SECTION - I

Q1) a)   Write a short note on Accelerogram.   [3]

      b)   Briefly explain Continental Drift Theory.   [4]

OR

      a)   Explain plate boundaries.   [5]

      b)   Define, Focus & Epicenter.   [2]

Q2) a)   Explain, Duhamel's Integral.   [7]

      b)   Explain, Logarithmic Decrement.   [7]

Q3) A four storied RCC residential building is 3 bays of 5 m in both directions. L.L. = 4 kN/m^2 and building is to be located in Mumbai. Calculate seismic forces on structure. All beams and columns are having the sizes of 300×400 mm. Thickness of slabs = 120 mm. Wall is of 150 mm thickness all around. Height of each floor 3.5 m. Assume Rocky and hard soil.   [14]

P.T.O.

SECTION - II

Q4) a) Write a detailed note on design philosophy of earthquake resistant structure. **[6]**

b) Write a detailed note on strong column-weak beam theory. **[6]**

OR

a) Explain the concept soil liquefaction and its effects. **[6]**

b) Explain ductile detailing of beam as per IS 13920. **[6]**

Q5) a) What is significance of vertical reinforcement in brick masonry? **[6]**

b) Write a note on repair and strengthening of RC member. **[5]**

Q6) a) What is base isolation of structure? **[6]**

b) Explain friction damper and its mechanism. **[6]**

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T.Y B.Tech(Civil Engineering) (Semester - V) (CBCS)
Examination, January - 2023
DESIGN OF STEEL STRUCTURES
Sub. Code : 80764

Day and Date : Tuesday, 17 - 01 - 2023

Total Marks : 70

Time : 10.30 a.m. to 01.00 p.m.

Instructions :
1) IS 800-2007 and steel table is allowed in Examination.
2) Question No.1 and question No.5 are compulsory.
3) Solve any 2 questions from Q. No,2,3,4 and any 2Questions from Q.No.6,7,8.
4) Figures to the right indicate full marks.
5) Assume suitable data if necessary and state them clearly.

SECTION - I

Q1) Attempt all questions.

a) Explain philosophy of limit state for strength and serviceability. **[3]**

b) What is block shear. **[3]**

c) Write step by step procedure for design of built up column. **[3]**

Q2) Attempt any Two from 2,3,4

a) Design a lap joint between the two plates of width 150 mm, if the thickness of one plate is 12 mm and the other is 10 mm. The joint has to transfer a factored load of 100 kN. The plates are of Fe 410 grade. Use M16 bolts of grade 4.6 (fub = 400 N/mm²). **[7]**

b) Design a suitable longitudinal fillet weld to connect 120 X 8 mm plate to 150 X 10 mm plate to transmit a pull equal to the full strength of the small plate. Assume field welding. **[6]**

Q3) Design tension member to carry factored tensile load of 100 kN.. the effective length of member is 3m. use 20mm shop bolts of grade 4.6 for the connection. **[13]**

Q4) A column 5m long has to support a factored load of 3600 kN. The column is held effectively at both ends and restrained against direction in one end. Assume fcd = 200 N/m². [13]

SECTION - II

Q5) **Attempt all questions:**
  a)   Discuss general requirements for battening system as per IS 800. [4]
  b)   Differentiate between bending and buckling of beam. [3]

Attempt any Two from Q 6,7,8

Q6) Design slab base for a column *ISHB* 350@ 710.2 N/m subjected to a factored axial compressive load of 1500 kN for the following conditions Load is transferred to the base plate by welded connections; the column end and the base plate are not machined for bearing. The base rest on concrete pedestal of grade M20. [14]

Q7) The roof of a hall of 12mx8m consists of a RC slab 100mm thk. And a 50mm floor finish. The slab is supported on steel beams spaced at 3m centre to centre. The live load on the slab is 2 KN/sqm. Design an intermediated steel beam I section. Assume that the slab provides adequate lateral restraint to the compression flange of the steel beam. [14]

Q8) Calculate the design forces for a gantry girder to be used in an industrial building carrying a manually operated overhead traveling crane for the following data: [14]
  • Crane capacity - 200 kN.
  • Self - weight of the crane girder excluding trolley - 200kN.
  • Self - weight of the trolley, electric motor, hook, etc. - 40kN.
  • Approximate minimum approach of the crane hook to the gantry girder - 1.20 m. • Wheel base - 3.5m.
  • c/c distance between gantry rails - 16m.
  • c/c distance between columns (span of gantry girder) - 8m.
  • Self weight of rail section - 300 N/m
  • Diameter of crane wheels - 150 mm. • Steel is of grade Fe 410.

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Seat No.

T. Y. B. Tech. (Civil Engineering) (Part - III) (Semester - V) (CBCS) Examination, January - 2023
GEOTECHNICAL ENGINEERING - I
Sub. Code : 80766

Day and Date : Saturday, 21 - 01 - 2023

Time : 10.30 a.m. to 1.00 p.m.

Total Marks : 70

Instructions :
1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state them clearly.
4) Answer shall be supported by adequate sketches.

SECTION - I

Q1) Attempt all questions: [12]

a) Explain Plasticity chart.

b) Explain IS soil classification system (as per IS 1498 - 1970).

Q2) Attempt any Two: [11]

a) Explain Seepage and discharge velocity.

b) In a constant head permeability test, a cylindrical sample of 100 mm in diameter and 150 mm in height is subjected to an unward flow of 540 ml/min. The head loss over the length of the sample is measured to be 360 mm. Calculate the coefficient of permeability in m/sec.

c) Explain constant head laboratory test.

Q3) Attempt any Two: [12]

a) Explain compaction methods and its suitability.

b) How to determine pre-consolidation pressure?

c) Determine MDD and OMC. Take G = 2.67, volume of mould = 945 cc.

Trial	1	2	3	4	5	6
Mass of wet soil (kg)	1.7	1.89	2.03	1.99	1.96	1.92
Water content (%)	7.7	11.5	14.6	17.5	19.7	21.2

P.T.O.

SECTION - II

Q4) Attempt all questions: **[12]**

   a)   Write short note on: Pressure Distribution on horizontal and vertical plane.

   b)   State the assumptions made in Westergards analysis in stress distribution.

Q5) Attempt any Two: **[11]**

   a)   Explain direct shear test.

   b)   Explain drainage conditions for determination of shear strength parameters.

   c)   The equation of the effective stress failure envelope for normally consolidated clayey soil is $£f = \sigma' \tan 25'$. A drained triaxial test was conducted with the same soil at a chamber confining pressure of 80 kN/m². Calculate the deviator stress at failure.

Q6) Attempt any Two: **[12]**

   a)   State concept of Rankine's and Coulomb's theory of earth pressure.

   b)   Compute intensities of active and passive earth pressure at a depth of 8 m in cohesion less soil with $\phi = 30°$ and $\gamma d = 18$ KN/cum. What will be active and passive pressure if water table rises to ground level take $\gamma sat = 22$ KN/cum.

   c)   Retaining wall with smooth vertical back 8 m high retains backfill in two layers. Soil properties are top layer –4 m thick, $\phi = 32°$, $\gamma = 15$ KN/cum. Bottom layer –4 thick, $\phi = 30°$, $\gamma = 17$KN/cum. Calculate resultant active force and its point of application.

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Seat
No.

T.Y. B.Tech. (Civil Engineering) (CBCS) (Semester - V)
Examination, January - 2023
PCC-CV503 : ENVIRONMENTAL ENGINEERING - I
(Paper - II)
Sub. Code : 80765

Day and Date : Thursday, 19 - 01 - 2023

Total Marks : 70

Time : 10.30 a.m. to 1.00 p.m.

Instructions :
1) All questions are compulsory.
2) Figures to the right indicate full marks.
3) Assume suitable data if necessary and state them clearly.
4) Answer shall be supported by adequate sketches.

SECTION - I

Q1) Attempt all questions. [12]

a) Why it is necessary to study Population forecasting? Discuss in brief population forecasting methods. [8]

b) Sketch and explain river intake structures. [4]

Q2) Attempt any Two. [12]

a) Design a circular settling tank for a flow of 5 MLD. [8]

OR

a) Explain the principle and working of Tube settler. [8]

b) What is difference between Coagulation and Flocculation. [4]

Q3) Attempt any Two. [11]

a) Enumerate the various methods of water softening. Explain any one method in detail. [6]

b) Explain the difference between slow and rapid sand filter and Multi-media filter. [5]

OR

b) State the causes and remedies of odour and taste problem in drinking water. [5]

P.T.O.

SECTION - II

Q4) Attempt all questions. [12]

a) Write a short note on Salient feature of rural water supply scheme. [8]

b) What are the various forces acting on underground pressure pipes? Explain with formulae. [4]

Q5) Attempt any Two. [12]

a) Determine the diameter of an equivalent pipeline 2000 m in length to replace the pipe system given below. (Length in m, Diameter in mm). [8]
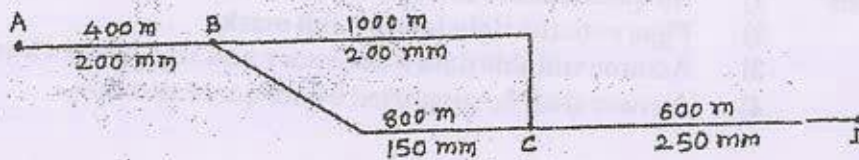
OR

a) Explain any two various layouts of water distribution with neat sketch. [8]

b) Discuss leakage detection in water distribution system with reference to [4]

   i) causes

   ii) methods

Q6) Attempt any Two. [11]

a) Sketch and explain [6]

   i) Air valve

   ii) Sluice valve

   iii) Non return vale

b) Write a short note on [5]

   i) Hydrants

   ii) DPR

OR

b) Explain necessity and importance of water audit in water supply system. [5]

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