B.E. DEGREE EXAMINATION, 2017

(CIVIL ENGINEERING)

(SEVENTH SEMESTER)

CLEC-701 / PCLEC-401. GROUNDWATER ENGINERING

(Common with Part - Time)

November]   [Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.
ALL questions carry EQUAL Marks.

UNIT - I

1. (a) Explain the occurence of groundwater.   (5)

   (b) Explain the following :   (10)

      (i) Void ratio.   (ii) Porosity.   (iii) Specific yield.

2. List the different types of aquifiers and explain them in detail.   (15)

UNIT - II

3. (a) Define Darcy's law and co-efficient of permeability.   (8)

   (b) Explain the laboratory measurement of permeability. Explain with a neat sketch.   (7)

4. In an unconfined aquifer having co-efficient of permeability $K = 10^{-3}$ m/s, resting above an impervious base, a fully penetrating well of diameter 0·3 m draws a steady state discharge of 120 m³/hour. Due to pumping, the water table is lowered by 1·5 m at a point 12 m from the centre of the well. If the water table was 15 m above the impervious base before the pumping started, compute the drawdown at 30 m from the well.   (15)

UNIT - III

5. (a) Describe the construction of shallow well and deep well.   (7)

   (b) Write a short note on infiltration gallery.   (8)

6. (a) Write the functions of perforation screens and gravel packing.   (7)

   (b) Explain the use of rigs in vertical and radial drillings.   (8)

UNIT - IV

7. Explain the methods of sub surface investigation.   (15)

8. Describe two methods of surface investigation of ground water.   (15)

UNIT - V

9. Describe the following :   (15)

   (a) Ditch and flooding type recharging of ground water.

   (b) Basin type recharging of ground water.

10. (a) What is meant by dispersion in sea water intrusion ?

    (b) Explain the methods to be followed in the control of sea water intrusion.

UNIT - I

1. Define the term duty and explain in detail about the various methods of improving duty.(15)

2. What is the necessity of providing a fall in a canal ? Explain the various considerations governing the location of a fall. Also, discuss about the various types of falls with neat sketches (15)

UNIT - II

3. Explain the criteria adopted designing various components of weir in permiable foundation. (15)

4. Discuss about the Khosla's and Bligh's theory and its applications. (15)

UNIT - III

5. Draw a neat sketch and explain the different parts of earth dam. (15)

6. Explain briefly about the various components its gravity dam with neat sketches. (15)

UNIT - IV

7. Discuss the factors that are to be considered in the hydraulic design of cross drainage works. (15)

8. Discuss on the methods used for the reclamation of salt affected soils. (15)

UNIT - V

9. Discuss briefly the history of irrigation development in Tamil Nadu. What is the scope of development of irrigation in the country ? Also, mention the advantages and ill effects of irrigation. (15)

10. Explain in detail the canal regualtor with the help of neat sketches. (15)

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B.E. DEGREE EXAMINATION, 2017

(CIVIL ENGINEERING)

(SEVENTH SEMESTER)

CLEC-703 / PCLEC-603. ENVIRONMENTAL ENGINEERING - II

(Common with Part - Time)

November]   [Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.

ALL questions carry EQUAL Marks.

UNIT - I

1. Calculate the combined flow discharge of sewage for the following data :

   Area served to be served = 150 hectares.   Population = 50,000.

   Time of entry = 5 minutes.   Time of flow = 20 minutes.

   Rate of water supply = 135 litres per head per day.

   Impermeability factor = 0·45.

   Assume 80 % of water turns into sewage and peak factor 1·5.

2. Estimate the storm run-off from 10 hectares of a surface having the following characteristics if the maximum intensity of rain in the area is 5 cm / hour :

Nature of surface	Roof	Pavement	Pavement yards	Macadam road	Lawns and garden	Thick vegetation
Area distribution (% of total)	30	10	5	25	25	5
Co-efficient of run-off	0·90	0·85	0·80	0·40	0·1	0·05

UNIT - II

3. (a) Discuss in detail the various types of materials used in sewer pipes.

   (b) Write a note on sewer appurtenances.

4. (a) Explain the various types of pipe systems of sewerage with neat sketches.

   (b) Write a note on house drainage system.

UNIT - III

5. The BOD sewage incubated for two day at 30° C has been found to be 135 mg/l. What will be five day BOD at 20° C ? Assume BOD rate constant K = 0·21 d^{-1} at 20° C ? (base e)

6. (a) Explain the Streter Phelps equation and its application.

   (b) Discuss the various characteristics and composition of sludge.

UNIT - IV

7. Design a circular primary sedimentation tank to treat an average flow of 5000 m^3/day suitably assuming the design criteria.

8. Design a septic tank for a population of 100 persons. Assume suitable data.

UNIT - V

9. Design an oxidation pond for a community of 7500 with capital sewage contribution of 90 litres/head/day. BOD of raw sewage is 250 mg/l.. BOD of treated sewage is 30 mg/l.

10. (a) Define and explain the different loading criteria based on which aeration tank of ASP is operated.

    (b) Write a note on principles and design of waste stabilization..

B.E. DEGREE EXAMINATION, 2017

(CIVIL ENGINEERING)

(SEVENTH SEMESTER)

CLEC-704 / PCLEC-602. REMOTE SENSING AND GIS

(Common with Part-Time)

November]   [Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.
ALL questions carry EQUAL Marks.

UNIT - I

1. (a) Derive the wave model of electromagnetic radiation.   (10)

   (b) Enlist the advantages and limitations of remote sensing.   (5)

2. Explain the various interactions of incident electromagnetic energy with the atmosphere. (15)

UNIT - II

3. Describe the concepts of spatial, spectral and radiometric resolutions in remote sensing system.   (15)

4. Briefly explain the principles of thermal remote sensing system and microwave remote sensing system.   (15)

UNIT - III

5. What do you understand by visual image interpretation ? Elaborate the basic elements of image interpretation.   (15)

6. (a) Write a detailed note on image enhancement techniques.   (10)

   (b) Enumerate the differences between supervised and unsupervised image classification. (5)

UNIT - IV

7. (a) Briefly expalin about map projections.   (10)

   (b) Describe the various key components of GIS.   (5)

8. (a) Illustate the scale of measurement in GIS.   (10)

   (b) Explain the function of Data Base Management Systems (DBMS).   (5)

UNIT - V

9. Describe the various vector and raster models in GIS.   (10)

10. Discuss the role of GIS in highway alignment studies.   (5)

B.E. DEGREE EXAMINATION, 2017

(CIVIL, CIVIL AND STRUCTURAL ENGINEERING)

(SEVENTH SEMESTER)

CLEE-705 / CSEE-704 / PCSEE-702. EARTH QUAKE ENGINEERING

(Elective)

(Common with Part- Time)

November]

[Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.

IS : 1983 -2002; IS-4236 - 1976; IS :3920 ; 1993; SP-22; IS-456 : 2000 are permitted.

ALL questions carry EQUAL Marks.

UNIT - I

1. (a) Write a short notes on the effects of soil properties and liquifaction of soils. (5)

   (b) What is the use of seismic zoning map ? How it is helpful ? (10)

(OR)

2. Discuss the types of soil liquifaction. What are the methods to rectify it ? (15)

UNIT - II

3. Differentiate between magnitude and intensity. How will you measure magnitude and intensity? Explain the methods briefly. (15)

(OR)

4. (a) Explain ground peak acceleration and ground peak velocity briefly. (8)

   (b) What are the do's and dont's for protection of life and property ? (7)

UNIT - III

5. Derive an expression for single degree of freedom in undamped system for free vibration.(15)

(OR)

6. Derive an expression for single degree of freedom in damped system for forced vibration.(15)

UNIT - IV

7. What are the methods used to analyse earthquake resistant structures ? Explain the procedure of each method as per IS - 1893:2002 ? (15)

(OR)

8. Why base isolation is effective in earthquake resistant design ? Explain the effectiveness in multistorey buildings. (15)

UNIT - V

9. (a) How do you evaluate the seismic co-efficients ? (5)

   (b) Explain how the following contributes to main causes of damage : (10)

   (i) Quasi resonance.   (ii) Lack of ductility.   (c) Lack of detailing.

(OR)

10. Discuss the equivalent static lateral earthquake force that act on the building. (15)

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B.E. DEGREE EXAMINATION, 2017

(CIVIL ENGINEERING)

(SEVENTH SEMESTER)

CLEE-706 / PCLEE-702. WATERSHED CONSERVATION AND MANAGEMENT

(Elective)

(Common with Part-Time)

November]   [Time : 3 Hours

Maximum : 75 Marks

Answer any ONE FULL question from each unit.
ALL questions carry EQUAL Marks.

UNIT - I

1. Discuss the classification of watershed.

2. Explain the erosion problems in India.

UNIT - II

3. Explain the methods of controlling the soil erosion.

4. Discuss the soil loss estimation models.

UNIT - III

5. Explain the water harvesting from run-off.

6. Explain flood water harvesting and and its merits.

UNIT - IV

7. Explain the various factors affecting the watershed management.

8. Explain the various watershed programmes.

UNIT - V

9. Discuss briefly the importance of pasture and fodder cultivation in order to improve the livehood of the water shed.

10. What are wastelands and how they are classified ? Elaborate the measures to develop the wastelands.