B.Tech. (Civil) 6th Semester (G-Scheme)
Examination, May–2024
HIGHWAY ENGINEERING-II
Paper– PCC-CE-306-G

Time allowed : 3 hours] *[Maximum marks : 75*

Before answering the questions, candidate should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note: *Attempt **five** questions in all, selecting **one** question from each Section. **Question No. 1 is compulsory.** All questions carry equal marks.*

1. Describe the following: 15

(a) List the types of pavement

(b) Assumptions of Westergaard's

(c) Tack Coat

(d) Slip- Form paving technique

(e) Types of overlays

(f) Subsurface Drainage

Section-A

2. (a) Briefly describe the design of flexible pavement by CBR Methods. 7

(b) Explain the factors affecting design of pavements. 8

3. (a) Explain the different types of joints in rigid pavement. 8

(b) Briefly explain the functions of Dowel and Tie Bars. 7

Section-B

4. (a) Explain various types of Bituminous Construction. 8

(b) What are the various IRC specification in bituminous pavement? 7

5. (a) Explain the construction procedure of WBM and WMM. 8

(b) Explain the slip form paving technique. 7

Section-C

6. (a) Explain different types of distress in flexible and rigid pavements along with the causes. 8

(b) Explain various types of maintenance of pavements. 7

7. (a) What are the different types of overlays? 7

(b) Explain the Benkelman beam method. 8

Section-D

8. (a) What are the necessity and significance of drainage? 7

   (b) Explain the special characteristics of hill roads. 8

9. (a) What are the methods of economic evaluation? 7

   (b) Explain the need of economic evaluation. 8

B.Tech. (Civil) (Elective-I) 6th Semester (G-Scheme) Examination, May–2024

WASTE WATER TREATMENT

Paper–PEC-CEEL-302-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note: *Attempt **five** questions in all selecting at least **one** question from each unit. **Question No. 1 is compulsory.** All questions carry equal marks. Assume if any missing data.*

1. (a) Define - Sullage, Sewer, Sewage, Sewerage

(b) Mention the factors affecting DWF.

(c) What are the functions of traps.

(d) State the objectives of sewage treatment.

(e) Do comparison between aerobic and anaerobic treatment of waste water.

(f) What do you mean by conditioning of waste water? 6×2.5

Unit-I

2. (a) Calculate the velocity of flow and corresponding discharge in a circular sewer having diameter of 1.00m laid at a gradient 1 in 500. The sewer is running at 0.5D. Take N= 0.012 in Manning's formula. 7

(b) Discuss the types of sewage system with their suitability. 8

3. (a) Describe the types of sewer available in Market. Explain their merits and demerits also. 8

(b) Explain the materials that can be used for sewer construction. 7

Unit-II

4. (a) Give a brief detail of house drainage system. 8

(b) Classify traps. Draw neat sketches also? 7

5. (a) Define BOD. Derive an expression for first stage BOD.

(b) Discuss the biological characteristics of waste water. 7

Unit-III

6. (a) Draw a flow chart of conventional treatment plant. 7

(b) Explain the working of coagulation aided sedimentation tank. 8

7. (a) Write the design criteria of septic tank. 9

(b) Elaborate the conventional and extended aeration system. 6

Unit-IV

8. (a) Enumerate the process of aerobic sludge digestion of waste water. 7

(b) What do you mean by dewatering? Write its various methods. 8

9. (a) Explain the self - purification process of stream. 7

(b) Explain about soil dispersion system. 8

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B.Tech. (Civil) 6th Semester (G-Scheme)
Examination, May–2024

IRRIGATION ENGINEERING

Paper–PCC-CE-302-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note: *Attempt **five** questions in all selecting at least **one** question from each unit. **Question No. 1 is compulsory**. All questions carry equal marks. Assume if any missing data.*

1. (a) Write the benefits of Irrigation.

   (b) Discuss about crop and crop season.

   (c) Why are canal drops are constructed in a canal system?

   (d) What are cross - drainage works? What is necessity of such works in a canal system?

   (e) Mention the requirements of good outlets.

   (f) Distinguish between alkaline and saline soil. 6×2.5

Unit-I

2. (a) Explain any three techniques of water distribution in farms. 8

   (b) Write the impacts of Irrigation. 7

3. A stream of 130 liters per second was diverted from a canal and 100 liters per second were delivered to the field. An area of 16 hectare was irrigated in 8 hours. The

effective depth of root zone was 1.7m the runoff loss in the field was 420 cu.m. the depth of water penetration varied linearly from 1.7 m at the head end of the filed to 1.1 m at the tail end. Available moisture holding capacity of the soil is 20cm per meter depth of soil. It is required to determine the water conveyance efficiency, water application efficiency, water storage efficiency and water distribution efficiency, Irrigation was started at a moisture extraction level of 50% of the available moisture. 15

Unit-II

4. (a) *Enlist the various types of canal falls. Discuss about Trapezoidal Notch fall.* 8

(b) What are Canal Escapes? How do they help in preventing the adjoining area against flooding? 7

5. (a) Draw a neat sketch of suitable design aqueduct for following crossing - (i) A Major canal over a large drainage (ii) A canal carrying low discharge over a large drainage 8

(b) Write the site selection criteria for cross - drainage works. 7

Unit-III

6. (a) Design an irrigation outlet for the following data:

FSQ of outlet = 50 lit/sec, FSL in distributary on

u/s side of outlet = 200.00m, FSL in water course on d/s side of outlet = 199.92m, FSD in distributary on u/s of outlet = 1.05m 8

(b) Describe anyone flexible outlet. 7

7. (a) Elaborate the various methods used for energy dissipation between spillways?. 8

(b) Write merits and demerits of - 7

(i) Side channel spillways

(ii) Syphon spillways

Unit-IV

8. (a) Explain the various types of Spurs of Groynes. 10

(b) Describe, how cut - off are used as a method of river training. 5

9. (a) How you will proceed to reclaim saline soil? 7

(b) Draw various types of tile drain. 8

B.Tech. (Civil) 6th Semester (G-Scheme) Examination, May–2024
FOUNDATION ENGINEERING
Paper– PCC-CE-304-G

Time allowed : 3 hours] *[Maximum marks : 75*

Note: *(i)* ***Question No.1 is compulsory.*** *Attempt* ***one*** *question from each section.*
(ii) All questions carry equal marks.
(iii) Assume missing data, if any, suitably.

1. Describe the following:

(a) Methods of boring

(b) Under reamed Pile

(c) Components of settlement

(d) Floating foundation and its suitability

(e) Negative skin friction

(f) Types of drilled piers

Section-A

2. What is the necessity of sub-surface exploration? Explain the different methods of boring used for sub-surface exploration with their merits and demerits.

3. (a) Enumerate the different types of soil samplers. Describe in detail any two types of soil sampler with neat diagram.

(b) What do you mean by dewatering? Explain in detail the vacuum method and Electro-osmosis methods of dewatering.

Section-B

4. (a) What is the safe bearing capacity of a rectangular footing 1 m × 2 m is located at a depth of 1.8 m in a saturated clay having unit weight 18 kN/m^3 and unconfined compressive strength 100 kN/m^3? Assume factor of safety of 2.5.

(b) What is the shear failure criterion? Describe the different modes of shear failure with diagram.

5. (a) What are the different components of settlement of foundation? Describe different methods to determine settlement of foundation.

b) Describe in detail the plate load test and its interpretation with diagram.

Section-C

6. (a) What are the different factors affecting bearing capacity of soil? Also describe any two methods to improve the bearing capacity of soil.

(b) What are the different types of raft foundation? Describe the methods for designing raft foundation.

7. (a) A group of 16 piles of 50 cm diameter is arranged with a Centre to Centre spacing of 1.2.m. The piles are 9 m long and are embedded in soft clay with cohesion 30 kN/m^3. Determine the ultimate load capacity of pile group.

(b) Describe the following:

(a) Pile load test

(b) Classification of piles

Section-D

8. What are the different types of caissons? Explain in detail each type of caisson with their advantages and disadvantages.

9. Describe the following:

(i) Construction procedure of drilled pier

(ii) Sinking of well

(iii) Different components of well foundation

(iv) Methods to rectify the tilts and shifts of well foundation