

Roll No.

3311

**B. Tech. 6th Semester (Civil) (Elective-II)
Examination – May, 2023**

REPAIR & REHABILITATION OF STRUCTURE

Paper : PEC-CEEL-312-G

Time : Three hours]

[Maximum Marks : 75

Before answering the questions, candidates 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 question carry equal marks.

1. Describe the following :

15

- (a) Repair Materials
- (b) Cracks
- (c) Upgrading of Structures
- (d) Interpretation of Cracking Pattern
- (e) Durability

SECTION – A

2. (a) Explain the global scenario of distressed structures. 7.5

(b) Why it is necessary to upgrade the structure ? 7.5

P. T. O.

3311-850-(P-2)(Q-9)(23)

3. Explain in detail deterioration due to water leakage, fire detection and mitigation. 15

SECTION – B

4. Explain the procedure of measurement of cracks and interpretation of cracking phenomenon. 15
5. Explain the preliminary and detailed investigation done in damage assessment. 15

SECTION – C

6. Explain the criteria, selection of repair material and methodology of repairing of structure. 15
7. (a) Explain the needs of retrofitting in detail. 7.5
- (b) Explain the conventional and advanced techniques available for strengthening. 7.5

SECTION – D

8. Explain the importance of protection and maintenance and categories of maintenance in detail. 15
9. (a) Explain the components of Structural Health Monitoring (SHM) and its working mechanism. 7.5
- (b) Explain the working of structural health monitoring as a tool for proactive maintenance of structures. 7.5

Roll No.

3307

**B. Tech. 6th Semester (Civil) (Elective - I)
Examination – May, 2023**

AIR AND NOISE POLLUTION CONTROL

Paper : PEC-CEEL-304-G

Time : Three Hours]

[Maximum Marks : 75

Before answering the questions, candidates 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. Define :

$6 \times 2.5 = 15$

- (a) Air Pollution
- (b) Atmosphere stability
- (c) Acid rain
- (d) Filter bags
- (e) Dispersion modelling
- (f) Objectives of air quality

P. T. O.

3307-150-(P-3)(Q-9)(23)

SECTION - A

2. (a) Describe the composition and structure of atmosphere. 8
(b) Write a short note on air quality management in India. 7
3. (a) Explain the sources and classification of air pollutants? 8
(b) Write in detail about effects of air pollution on human health, plants and animals. 7

SECTION - B

4. Explain lapse rate and dispersion of air pollutants. 15
5. Describe air quality index and comprehensive environmental pollution index and its application. 15

SECTION - C

6. Explain the following Global Environmental Issues :
5 × 3 = 15
- (a) Global warming,
(b) Smog,
(c) Ozone layer depletion.
7. Explain the Control Methods and Equipment for Particulate Matter and Gases. 15

SECTION – D

8. Write short notes on :

8 + 7

- (a) Characteristics of sound and its measurement
- (b) Outdoor and Indoor Noise Propagation

9. Explain :

5 × 3 = 15

- (a) Infra-Sound and Ultrasound
 - (b) Noise standards and permissible values
 - (c) Impulsive Sound and Sonic Boom.
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Roll No.

3305

**B. Tech. 6th Semester (Civil)
Examination – May, 2023**

HIGHWAY ENGINEERING - II

Paper : PCC-CE-306-G

Time : Three Hours]

[Maximum Marks : 75

Before answering the questions, candidates 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 Unit. Question No. 1 is **compulsory**. All questions carry equal marks.*

1. Describe the following : 2.5 × 6 = 15
- (a) Components of Pavements
 - (b) Critical location of loading
 - (c) Mastic Asphalt
 - (d) Subgrade Construction
 - (e) Non Destructive Evaluation
 - (f) Flexible Overlays

3305- | ~~600~~ (P-3)(Q-9)(23)

P. T. O.

UNIT – I

2. (a) Briefly describe the design of pavements. 7
(b) Explain the pavement performance and its methods-AASHTO. 8
3. (a) Explain the design of dowel and tie bars. 8
(b) Briefly explain method of rigid pavement design. 7

UNIT – II

4. (a) Explain the construction of BUSG and Premix Carpet. 7
(b) What are the functions of rollers, Paver and Hot Mix plants? 8
5. (a) Explain the construction of WBM and WMM. 8
(b) Explain the construction of DLC. 7

UNIT – III

6. (a) Explain classification of distresses in pavements. 8
(b) Explain the functional and non destructive evaluation of pavements. 7
7. (a) What is the objective of strengthening of pavement? 7
(b) Explain the thickness approach and deflection approach. 8

3305- (P-3)(Q-9)(23) (2)

UNIT – IV

8. (a) What are the modes of ingress of water in highway structure? 7
- (b) Explain the types of subsurface drainage. 8
9. (a) Explain the cost estimation in highway economics. 7
- (b) Explain the PPP projects and rate analysis of MoRTH-Standard Data Book. 8
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Roll No.

3304

**B. Tech. 6th Semester (Civil)
Examination – May, 2023**

FOUNDATION ENGINEERING

Paper : PCC-CE-304-G

Time : Three Hours]

[Maximum Marks : 75

Before answering the questions, candidates 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 Unit. Question No. 1 is **compulsory**. All questions carry equal marks. Assume missing data, if any, suitably.*

1. Describe the following :
 - (a) Methods of boring
 - (b) Types of shallow foundations
 - (c) Components of settlement
 - (d) Lateral load capacity of a pile
 - (e) Negative skin friction
 - (f) Factors affecting well foundation

3304-1600-(P-4)(Q-9)(23)

P. T. O.

UNIT – I

2. (a) What are the stages in soil exploration ? Explain in detail the depth and lateral extent of exploration.
 - (b) What are the sounding and geophysical methods for sub-surface explorations ? Explain any *two* methods in detail.
3. What is the necessity of drainage and dewatering ? Explain the different methods of dewatering in detail.

UNIT – II

4. (a) Determine the net ultimate bearing capacity of a rectangular footing, $1\text{m} \times 2\text{m}$, on the surface of a saturated clay having unconfined compressive strength of 100 kN/m^2 .
 - (b) Describe the effect of G.W.T. and eccentricity on the bearing capacity of soil.
5. (a) What are the various causes of settlement of foundation ? Describe the allowable bearing pressure based on settlement and IS code method.
 - (b) What is the conventional procedure of proportioning of footing ? Explain in detail.

UNIT – III

6. (a) Describe the static analysis and dynamic analysis for pile foundation.
- (b) What is the necessity of pile foundation ? Classify the piles and their selection criteria on different bases and explain them in detail.
7. (a) What is floating and raft foundation ? Describe the bearing capacity of raft in different types of soil.
- (b) Write short notes on :
- (i) Methods of improving bearing capacity
 - (ii) Seismic consideration

UNIT – IV

8. (a) What are the different types of caissons ? Describe in detail the settlement and construction procedure of any *one* type of caisson.
- (b) Describe the types and construction procedure of different drilled piers. Also explain the uses of drilled piers.

P. T. O.

3304-

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(3)

9. (a) What is the necessity of well foundation ? Describe the different methods to rectify the tilts and shifts of well foundation.
- (b) What are the shapes of well foundation ? Describe the different components of well foundation in detail.
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Roll No.

3303

**B. Tech. 6th Semester (Civil)
Examination – May, 2023**

IRRIGATION ENGINEERING

Paper : PCC-CE-302-G

Time : Three Hours]

[Maximum Marks : 75

Before answering the questions, candidates 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 Unit. Question No. 1 is compulsory. All questions carry equal marks.

1. (a) State the necessities of irrigation. 2.5 × 6
- (b) Mention the National Water Policies in India.
- (c) Define Canal Fall. Where they are located ?
- (d) What do you mean by cross-drainage works ?
Explain as to why such works are not set within a ridge canal system ?

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3303-1600(P-4)(Q-9)(23)

- (e) Write the importance of outlets in irrigation canal system.
- (f) Distinguish between alkaline and saline soil.

UNIT – I

2. (a) Discuss the advantages and disadvantages of irrigation. 5
- (b) Explain the various types of irrigation. 10
3. A sandy loam soil holds water at 140 mm/m depth between field capacity and permanent wilting point. The root depth of the crop is 30 cm and the allowable depletion of water is 35%. The daily water use by the crop is 5 mm/day. The area to be irrigated is 60 ha and can be diverted at 28 l.p.s. the surface irrigation application efficiency is 40%. There are no rainfall and ground water contribution. Determine : (i) Allowable depletion depth between irrigation (ii) Frequency of irrigation (iii) Net application depth of water (iv) Volume of water required (v) Time to irrigate 4 ha plot.

15

3303- (P-4)(Q-9)(23) (2)

UNIT – II

4. (a) Enlist the various types of canal falls. Discuss about ogee falls. 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 : 10
- (i) A major canal over a small drainage
- (ii) A canal carrying low discharge over a large drainage
- (b) Mention the factors affecting the selection of cross drainage. 5

UNIT – III

6. (a) Elaborate the design criteria for judging the performance of outlets. 7
- (b) Describe any *one* non-modular outlet. 8
7. (a) Explain the various methods used for energy dissipation between spillways. 9
- (b) Write merits and demerits of : 6
- (i) Ogee spillways
- (ii) Straight spillways

UNIT – IV

8. (a) What are the different types of rivers and their characteristics? 7
- (b) Discuss the functions of launching apron. Draw neat sketch also. 8
9. (a) State the principles, causes and effects of water logging. 7
- (b) Describe the working of tile drain. 8
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