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Tech. (Civil) (Elective-II) 6th Semester (G Scheme)  
Examination, July-2022

**REPAIR & REHABILITATION OF STRUCTURE**  
**Paper-PEC-CEEL-312-G**

*Time allowed : 3 hours]*

*[Maximum marks : 75*

*note: Question No. 1 is compulsory. Students have to attempt five questions in total at least one question from each section. All questions carry equal marks.*

- (a) Draw different crack patterns.
- (b) What are the different types of distress ?
- (c) How can you rectify Fire damage ?
- (d) What do you understand about Nailing ?
- (e) Write short note on corrosion activity measurements.
- (f) Write briefly about Rebar locator.

**Section-A**

- (a) Explain about the Physical processes of deterioration like freezing and Thawing.
- (b) Explain the process for durable concrete repairs.

1-P-3-00 (22)

[P. T. O.]

( 2 )

3. (a) Write clear note on Carbonation and Alkali  
(b) How do you evaluate repair, and rehab structure distressed due to fire and exposure ?

### Section-B

4. (a) Discuss the quantification and measurement of cracks in concrete structures.  
(b) Explain the different types of cracks for concrete structures. Also list the repair measures.
5. (a) A RCC building is under distress due to corrosion. Column beams and slabs are cracked. The age of building is 22 years. Give a flowchart for diagnosis and suitable repair scheme.  
(b) Write elaborate notes on the damage assessment and allied test.

### Section-C

6. Write short notes on mechanism of :  
(a) Epoxy injection  
(b) Underpinning

7. (a) A RCC beam needs to be strengthened to take additional load. Suggest necessary strengthening method including materials.
- (b) Explain with neat sketch how to do jacketing and strengthening to a column.

### Section-D

8. Write clear note on the following:
- (a) Importance of Protection and Maintenance
- (b) Corrosion mitigation techniques
9. (a) What are the authentic guidelines for the structural health monitoring.
- (b) Explain the working system of components structural health monitoring in details.

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B. Tech. (Civil) (Elective-I) 6th Semester  
(G Scheme) Examination, July-2022

**AIR AND NOISE POLLUTION CONTROL**

**Paper-PEC-CEEL-304-G**

*Time allowed : 3 hours]*

*[Maximum marks : 75*

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

Define :

6×2.5=15

- (a) Sources of Air Pollution
- (b) Plume Behaviour
- (c) Air Sampling
- (d) Stack height
- (e) Air Quality index
- (f) Noise pollution

**Section-A**

- (a) Describe the air pollution and global climate in brief. 8
- (b) Write a short note on national ambient air quality standards. 7

307-P-3-Q-9 (22)

[P. T. O.]

( 2 )

3. (a) Explain the chemical and instrumental of air pollutants.
- (b) Write in detail about effects of air pollution on archaeological monuments.

### Section-B

4. Explain concept of atmospheric stability, also adiabatic and environmental lapse rate ?
5. Describe concept of maximum depth and vent coefficient and factors affecting Pollutant Dispersion ?

### Section-C

6. Explain Gaussian Plume Model in dispersion model with its applications and limitations.
7. Explain the design, working of scrubber and electrostatic Precipitator.

### Section-D

8. Write a short note on :
  - (a) Sources of noise pollution
  - (b) Psychoacoustics and noise criteria curves

9. Explain :

(a) Effects of noise pollution on human and environment.

(b) Noise control methods

7+8

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B. Tech. (Civil) 6th Semester (G Scheme)  
Examination, July-2022

**HIGHWAY ENGINEERING-II**

**Paper-PCC-CE-306-G**

*Time allowed : 3 hours]*

*[Maximum marks : 75*

*Note : Question No. 1 is compulsory. Students have to attempt five questions in total at least one question from each section. All questions carry equal marks.*

- (i) What is ESWL ?
- (ii) Mention the types of joints in rigid pavements.
- (iii) Enlist the various types of bitumen and its quality tests.
- (iv) What are the pavement roughness index ?
- (v) State the desirable properties of road aggregate.
- (vi) Mention the desirable properties of soil as a highway material.

**Section-A**

- (i) Discuss the advantages and limitations of CBR method of design.
- (ii) Enumerate the various methods of flexible pavement design. Briefly indicate the basis of design in each case.

305-P-3-Q-9 (22)

[P. T. O.]

( 2 )

3. (i) Design the CC pavement thickness, expansion and contraction joint spacing, dowel and tie bars for a wheel load of 4500 kg. Assume all values suitably.
- (ii) Compare warping stress and frictional stress in rigid pavement.

### Section-B

4. Explain with sketches the requirements of joints and sealers. Discuss the desirable properties and various materials in use.
5. Explain briefly the method of Wet Mix Macadam Construction of Roads. What are the uses and limitations of this type of road ?

### Section-C

6. Explain the various types of failure in cement concrete pavement and their causes and prevention measures with sketches.
7. Explain in detail :
- (i) Types of overlays
  - (ii) Benkelman Beam Test

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**Section-D**

- (i) Discuss the maintenance problems in hill roads.
  - (ii) Discuss how the problem of road construction in water logged areas may be solved.
- Explain in brief :
- (i) Highway user benefits and cost
  - (ii) Highway Finance
  - (iii) Economic Evaluation

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B. Tech. (Civil) 6th Semester (G Scheme)

Examination, July-2022

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.*

Describe the following :

15

- (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**

- (a) What do you mean by soil sampling ? Describe in detail the different types of soil sampler with their suitability. 7

304-P-4-Q-9 (22)

[P. T. O.]

(2)

- (b) Describe briefly different soundings geophysical methods for sub-surface explorations.
3. (a) With the neat sketches, explain the working of "Electro-osmosis" and "Deep well drainage" methods of dewatering.
- (b) Briefly describe :
- (i) Exploration logs
  - (ii) Pressure-meter Test

### Section-B

4. (a) Describe in detail the conventional procedure of proportioning of footing.
- (b) Explain the Plate Load Test with diagram showing how the bearing capacity of soil can be determined by this test ?
5. (a) Briefly describe the design criteria for structural safety of foundation.
- (b) A square footing  $2.5 \text{ m} \times 2.5 \text{ m}$  is located at a depth of 1.8 m in sand. Calculate the ultimate bearing capacity if :
- (i) GWT is well below the foundation level

(ii) GWT is at the surface.

Given unit weight of sand =  $18 \text{ kN/m}^3$ ,  $c' = 0$  and  $\phi = 35^\circ$ . For  $\phi = 35^\circ$ ,  $N_c = 58$ ,  $N_q = 49$  and  $N_\gamma = 67$ .

### Section-C

6. (a) What is the necessity of pile foundation? Classify the pile on different bases and explain them in detail. 7
- (b) Briefly describe "Group action of piles". Explain the factors affecting pile group capacity. 8
7. (a) Explain the detailed procedure to conduct pile load with neat diagram. 7
- (b) Write a short note on :
- (i) Raft foundation and its types
- (ii) Methods of improving bearing capacity of soil 8

### Section-D

8. (a) Explain the components of Pneumatic caisson with diagram. What are the advantages and disadvantages of Pneumatic caisson? 10
- (b) What do you mean by sinking of well? Explain briefly. 5

[P.T.O.]

9. (a) Describe the different methods to rectify the tilts and shifts of well foundation.
- (b) What is the necessity of well foundation. Describe different components of well foundation in detail.



**B. Tech. (Civil) 6th Semester (G Scheme)  
Examination, July-2022**

**IRRIGATION ENGINEERING**

**Paper-PCC-CE-302-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.*

Describe the following :

15

- (a) Field capacity
- (b) Enumerate the advantages and disadvantages of tube well irrigation.
- (c) Differentiate between siphon and super passage
- (d) Classification of cross drainage works
- (e) Requirements of spillway
- (f) Guide banks

**Section-A**

- (a) Define base period and crop period. Give the relation between duty delta and base period. 7

- (b) What is Drip irrigation ? Describe the component parts of drip irrigation system.
3. (a) What are the various components of irrigation system ? Describe lift irrigation and flow irrigation in detail.
- (b) What are the uses of irrigation ? Differentiate between perennial and inundation irrigation.

### Section-B

4. (a) Define silt ejector. Describe the different methods to control silt entry into the off-taking channel.
- (b) What is canal head work ? Describe the various components of canal head work.
5. Design a siphon aqueduct with the following data:
- Discharge of canal = 56 cumecs
  - Bed width of canal = 32 m
  - Canal depth = 1.98 m
  - Bed level of canal = 267.00 m
  - High flood discharge of the drainage = 425 cumecs
  - Bed level of drainage = 265.50 m
  - HFL of the drainage = 268.20 m
  - General ground level = 267.20 m

**Section-C**

6. (a) What are the requirements of a canal outlet ? Describe the different types of canal outlets with their characteristics. 7
- (b) A water course is to take a flow of 0.04 cumec. Design an open flume outlet from the connected distributary if the full supply depth in the distributary is 70 cm. 8
7. (a) What are the different types of spillway ? Describe any two types of spillway in detail with neat diagram. 8
- (b) What do you mean by stilling basin ? Explain I.S. stilling basin in detail. 7

**Section-D**

8. (a) What are the objectives of river training works ? Describe in detail the methods and planning of river training. 8
- (b) Describe in detail different causes of water logging. Also describe its preventive measures. 7

9. Describe the following :

- (a) Necessity and classification of drains.
- (b) Land drainage and land reclamation
- (c) Spur and cutoffs

15

