Code No. D-3664/CBCS

FACULTY OF ENGINEERING

B.E. (Civil) VI - Semester (CBCS) (Backlog) Examination, March / April 2022

Subject: GROUND IMPROVEMENT TECHNIQUES

Professional Elective - II

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1. What is the need of Ground Improvement Techniques?
2. Explain the objectives of blending of aggregate in Mechanical stabilization.
3. State any two applications of grouting in ground improvement.
4. List the admixtures used in clay soil stabilization.
5. Mention factors affecting suitability number.
6. State the functions of Sandwicks.
7. Differentiate sand drains and stone columns.
8. List out applications of Geogrids.
9. Mention functions of Geotextiles.
10. Mention the differences between woven and non-woven geotextiles. .

PART – B

Note: Answer any five questions. **(5 x10 = 50 Marks)**

11. (a) State the procedure of lime stabilization and factors affecting it.
    (b) What are the primary objectives of ground improvement? Explain its necessity in various stages in civil engineering projects.

12. (a) Explain Rothfutch's method of proportioning of materials in mechanical stabilization of soils.
    (b) Classify and discuss in detail the methods and applications of grouting.

13. (a) Write a detailed note on various "Dewatering methods "and explain how they can be employed in ground improvement.
    (b) Discuss the advantages and disadvantages of cement stabilization over bitumen stabilization.

14. (a) Write in detail the thermal methods of soil stabilization.
    (b) Describe the vibro floating technique including its merits and demerits.

15. (a) Explain in detail about the method of Pre-loading? How do Vertical drains improve the functioning of preloading technique?
    (b) Write a note on Vacuum method of in-situ densification of Cohesive soils and also discuss the necessary condition for its effectiveness.

16. (a) What are the various tests conducted on geo-textiles
    (b) Discuss the principles involving in the design of reinforced earth.

17. Write short notes on any **TWO** of the following:
    (a) Jet grouting.
    (b) Compaction piles.
    (c) Dynamics techniques.

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OU - 1607 OU - 1607

Code No: D-3674/CBCS

FACULTY OF ENGINEERING

B.E. (EEE) VI - Semester (CBCS) (Backlog) Examination, March / April 2022

Subject: Electric Distribution System

Professional Elective - II

Time: 3 Hours **Max. Marks: 70**

Missing data, if any may be suitably assumed

PART – A

Note: **Answers all questions**. **(10 x 2 = 20 Marks)**

1. Compute average power loss, if power loss at peak load is 100KW and loss factor is 0.3
2. Define the following i) Loss factor II) Contribution factor
3. What are factor affecting primary feeder loading.
4. List the component of distribution stations
5. Brief about secondary network
6. What is meant by primary and secondary distribution?
7. Why voltage drop consideration are important in distribution system.
8. Define the term (i) Normal voltage (ii) Rated voltage.
9. Advantage of Distribution Automation
10. Mention the application of capacitors.

PART - B

Note: Answers any five questions. **(5 x 10 = 50 Marks)**

11. a) Explain about different Rate Structures.
    b) a distribution substation of a company supply power to small city experience an annual peak load of 3500 KW. Total annual energy supplies to primary feeder circuit is 1,00,00,000KW. Find (i) Annual Average power demand (ii) Annual load factor.

12 a) Explain any three substation bus schemes
   b) How do you analyses a substation area with n primary feeders?

13. Discuss radial and loop type primary feeders and given the advantages and disadvantages.

14. Derive the necessary equations for voltage drop and power loss in a radial feeder with uniformly distributed load.

15. Explain the detail design consideration of secondary distribution system

16. Derive the equation for voltage drop and power loss for single – phase two-wire lateral with (i) undergrounded lateral (ii) uni-ground lateral.

17. Consider a 2.4KV, 1 phase circuit feeds a load of 360KW at a lagging load factor and load current is 200A. It is desired to improve the power factor, determine following:
    a) Uncorrected power factor and reactive load
    b) The new corrected power factor after installing a shunt capacitor unit with a rating of 300 KVAR.

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OU - 1607 OU - 1607

Code No. D-3677/CBCS

FACULTY OF ENGINEERING

B.E. (EIE) VI - Semester (CBCS) (Backlog) Examination, March / April 2022

Subject: Piping and Instrumentation Diagrams
Professional Elective - I

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1. What do you mean by P & I Ds? Explain with an example?
2. Draw the symbols of the following;
   (i) Motor Driven turbine ii) back pressure valve iii) Centrifugal pump
   (iv) Rotary compressor
3. Define the definition and terminology used in P & I Diagrams.
4. List out the significance of P & I Diagrams in a process control?
5. Outlined the philosophy aspects of instrumentation installation in preparation of P & I Diagrams?
6. State the abbreviations of the following;
   i) NC ii) ST(W) iii) BFW iv) ISA
7. List out the various industry codes and standards of P & IDs.
8. Discuss the analog loop diagram for simple applications with relevant diagrams?
9. What do you mean by drafting? Explain?
10. Explain the necessity of P & IDs with an example?

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11. Explain in detail the different types of engineering drawings with relevant examples?
12. With examples, explain the various interpreting of various P & IDs equipment?
13. (a) List out the various symbols and abbreviation used in P & IDs?
    (b) Explain in detail the minimum information to be shown on P & I Diagrams?
14. (a) What does Steam trap assembly means? Explain?
    (b) Explain various designing criteria for preparation of P & IDs?
15. (a) Explain the Steps involve for handling of licensed process of P & I Diagrams?
    (b) Discuss in detail how the P & I Diagrams preparation steps established?
16. With examples, give the outline of the equipment labeling and identification systems of the P & IDs?
17. Write Short notes on;
    (a) Line numbering and valve numbering
    (b) Smart P & I Diagrams
    (c) Instrumentation and Piping

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OU - 1607 OU - 1607

Code No. D-3683/CBCS

FACULTY OF ENGINEERING

B.E. (ECE) VI - Semester (CBCS) (Backlog) Examination, March / April 2022
Subject: Digital Image Processing
Professional Elective – I

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1. What is meant by Digital Image Processing? Explain how digital images can be represented.
2. Assume that a 20m high structure is observed at a distance of 150m. What is the height of the image formed at retina?
3. Give the properties of 2-D DCT.
4. Write the properties of Hadamard Transform.
5. Give the block diagram of source encoder
6. Give the mask for Laplacian for image enhancement in spatial domain.
7. What is geometric transformation?
8. What is Bit plane slicing? Mention its applications?
9. What is salt and pepper noise? Which filter is used to reduce the noise and how?
10. What is meant by morphological image processing?

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11. (a) What is Digital Image processing? Draw the block diagram and explain the various fundamental steps involved in Digital Image processing?
    (b) Image transmission is done in packets. A packet consists of a start bit, a byte of data and a stop bit.
    (i) How many minutes would it take to transmit a 512 x 512 image with 256 grey levels at baud rate.
    (ii) What would be the time at 9600 baud rate?

12. (a) Show that 2-D DCT can be implemented via N-point FFT.
    (b) Generate Slant transformation matrix for N = 4.

13. (a) Explain image sharpening filters in frequency domain.
    (b) Find the histogram of the following image.

1	2	4
1	4	5
4	3	4

14. (a) Explain image compression model with neat diagram.
    (b) Explain Laplacian in Frequency Domain.

15. (a) What is thresholding? Explain about global thresholding.
    (b) Draw and explain the block diagram of Transform coding in detail.

OU - 1607 OU - 1607

16. (a) Define Histogram? Perform Histogram equalization on the given segment of Image?

10	11	12	11	10
12	12	13	5	4
13	12	5	3	5
13	12	4	3	5
12	4	5	4	4

(b) Bring out the differences between spatial domain and frequency domain image enhancement approaches

17. Write short notes on:
    (i) Discuss various adjacency in an Image.
    (ii) Contrast Stretching in Image enhancement.
    (iii) Lossless prediction coding.

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OU - 1607 OU - 1607

Code No. D-3684/CBCS

FACULTY OF ENGINEERING

B.E. (ECE) VI - Semester (CBCS) (Backlog) Examination, March / April 2022
Subject: Data Communication and Computer Networking
Professional Elective – I

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1 What are the major components of data communication system?
2 What do you mean by network topology?
3 What are the functions of data link layer?
4 Define Flow control.
5 What is DNS resource record?
6 Differentiate between public key and private key algorithm.
7 What are the key elements of the protocol?
8 What is Routers?
9 What is the need of data encryption and decryption?
10 What is the difference between Symmetric and Asymmetric key?

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11 (a) Explain about different LAN Topologies.
(b) Discuss briefly about each of the OSI layers.

12 (a) Write about Error detecting and Error correcting codes explain with an examples.
(b) Explain in detail about IEEE 802.3 frame format.

13 (a) Explain about the key design issues in network layer.
(b) Draw the IPV4 header format and explain in various fields on it.

14 (a) Draw and explain the TCP segment header.
(b) Explain in detail about ATM Cell format.

15 (a) Explain the DNS name space.
(b) Explain the architecture and services of E-mail.

16 (a) Discuss briefly about HDLC data link control protocol.
(b) Explain the function of MAC sub layer and give the MAC frame format.

17 Write short notes on:
(a) X.25
(b) Digital signatures.

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CU-1607 CU-1607

Code No. D-3698/CBCS

FACULTY OF ENGINEERING

B.E. (MECH) VI - Semester (CBCS) (Backlog) Examination, March / April 2022
Subject: Non-Conventional Energy Sources
Professional Elective – I

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1. What do you understand by greenhouse effect and its consequences?
2. What is the present annual primary energy consumption of the world?
3. Write short notes on energy plantation.
4. Discuss solar radiation in India.
5. Explain the concept of power in wind energy.
6. List the different types of geo-thermal energy system.
7. What is polarization?
8. What are the applications of Solar pond?
9. What is ocean wave energy?
10. Classify the different biogas plant.

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11. Discuss in brief, the merits and demerits of renewable energy sources.

12. Explain step-by-step procedure for the design of a solar photovoltaic power plant.

13. Classify fuel cell systems and explain the block diagram of any two of it in detail.

14. Sketch and explain the working of floating gas holder type biogas plant used in India. (KVIC plant)

15. a) Discuss the environmental aspects of wind energy collectors.
    b) Explain the site selection considerations for wind energy.

16. a) Explain in brief, the parameters affecting the performance of flat plate collectors.
    b) Write short notes on collector efficiency factor and collector heat removal factor.

17. Write short notes on the following:
    a) WECS.
    b) Photosynthetic efficiency.

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OU - 1607 OU - 1607

Code No. D-3710/CBCS

FACULTY OF ENGINEERING

B.E. (CSE) VI – Semester (CBCS) (Backlog) Examination, March / April 2022

Subject: Graph Theory and its Applications

Professional Elective - II

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

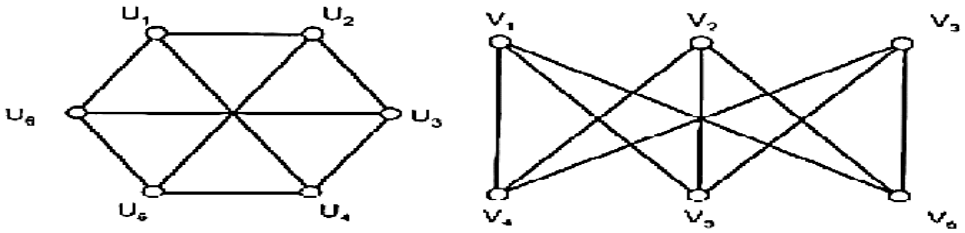
Note: Answer all questions. **(10 x 2 = 20 Marks)**

1. Is there a graph with degree sequence (1,3,3,3, 5,6,6) Justify?
2. Explain first theorem of graph theory.
3. What is Chordal graph?
4. What is bipartite graph?
5. Find the chromatic number of complete graph of n vertices.
6. Find chromatic number of the “wheel” graph.
7. What is line connectivity?
8. What is Euler’s formula?
9. What is a clique?
10. What is a degree sequence?

PART – B

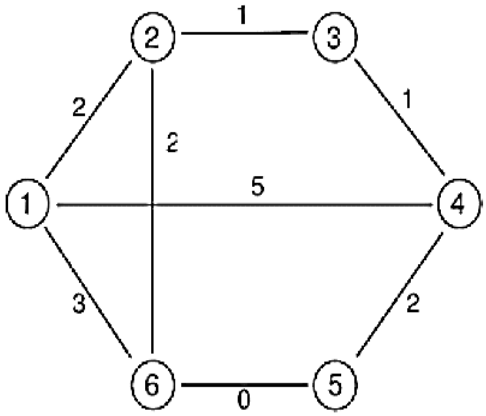
Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11. What is Isomorphism? Check whether the following graphs are Isomorphic or not? Justify your answer?



12. (a) Explain Fleury's algorithm.

    (b) Find optimal tour by using Chinese postman problem.



OU - 1607 OU

13. (a) Write a short note on Bipartite graphs and line graphs.

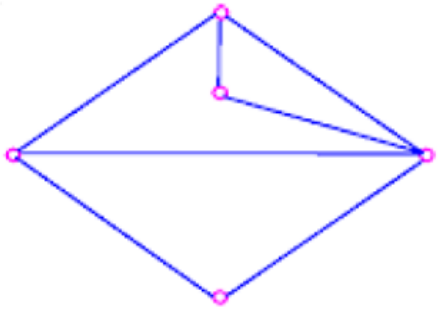
    (b) Prove that in any non-directed graph there is an even number of vertices of odd degree?

14. Explain and prove the Brooks theorem using a spanning tree?

15. (a) What are planar graphs? State and prove the 5 color theorem?

    (b) Explain how do you find the Hamiltonian cycle in a directed graph?

16. (a) Explain Euler's Formula. Give the dual graph for the following planar graph. Check whether it is self dual or not.



    (b) How do you find the Eulerian circuit in a directed graph?

17. Write short notes on:

    (a) Minimum spanning trees

    (b) Greedy coloring algorithm

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OU - 1607

Code No. D-3712/CBCS

FACULTY OF ENGINEERING

B.E. (CSE) VI - Semester (CBCS) (Backlog) Examination, March / April 2022
Subject: Advanced Databases
Professional Elective – II

Time: 3 hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1 Explain with the help of examples type Inheritance in Object Based Databases.
2 Short notes on Class extent.
3 Write short notes on APIs of XML.
4 Illustrate with a neat diagram how the parsing for a submitted Query is done by SQL Engine.
5 Explain in detail about Round-Robin Partition ing method.
6 List any four Equivalent Rules with appropriate examples.
7 Explain two-phase commit protocol in distributed databases.
8 What is meant by cache coherence?
9 What are performance Benchmarks in databases?
10 What are tunable parameters?

PART – B

Note: Answer any five questions. **(5x10 = 50 Marks)**

11 (a) Explain how Object Relational features are implemented. What are conceptual issues of persistent programming languages.
(b) Explain the salient features of persistent C++ systems. How it reflects in Object Oriented Databases, illustrate with an example.

12 (a) Differential between DTD and XML schema. What are the advantages of XML schema over DTD.
(b) Explain the features of XPath with the help of suitable syntaxes. And illustrate FLOWR expression with the help of an example.

13 (a) How are nested queries, joins and functions specified in XQuery? Explain with the help of examples.
(b) Briefly explain the various selection operations (A1 to A6) along with their respective cost estimation.

14 (a) List the various Joint algorithms and perform cost estimation for Nested-Loop Join.
(b) What are the two ways of evaluating expressions? List out the equivalence rules for transformation of relational expressions.

15 (a) Explain and compare various partitioning techniques. How is skew is handled in Range Partitioning method?
(b) Explain the Three-Phase commit protocol in distributed databases.

OU-1607 OU - 1607

16 (a) Explain the following types of failures: failure of site, failure of coordinator, network partition.

(b) What are different spatial data indexing structures? Describe any one of them.

17 (a) Write notes about heterogeneous distributed databases.

(b) Explain Strict Two-Phase Locking protocol databases.

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OU - 1607 OU - 1607

Code No. D-3717/CBCS

FACULTY OF ENGINEERING

B.E. (IT) VI – Semester (CBCS) (Backlog) Examination, March / April 2022
Subject: Data Mining
Professional Elective – II

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1. Explain data cleaning.
2. What do you mean by Data Processing?
3. What are the different trends in data mining?
4. Define Text Mining.
5. What are the key issues in data Mining?
6. Discuss the need of human intervention in data mining process.
7. What is Data Transformation?
8. What is Market based analysis.
9. What is Clustering? What are different types of clustering?
10. What is data mining? State its applications.

PART – B

Note: Answer any five questions. **(5 x10 = 50 Marks)**

11. Explain different classification Techniques.
12. Explain various methods of data cleaning in detail.
13. Explain algorithm for decision tree induction using greedy algorithm.
14. (a) Discuss the issues for prediction process.
    (b) Explain in brief classification and prediction with an example.
15. Describe the fundamental of data Mining and Kinds of Patterns that can be mined.
16. (a) Define Frequent sets, confidence, support and association rule.
    (b) Describe in detail the Basic statistical description of data.
17. Write notes on:
    (a) Data similarity and Dissimilarity
    (b) Set Mining Methods
    (c) Spatial mining

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OU - 1607 OU - 1607

Code No. D-2165/AICTE

FACULTY OF ENGINEERING

B.E. (CIVIL) VI - Semester (AICTE) (Backlog) Examination, March / April 2022
Subject: Ground Water
Professional Elective – III

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1 Define Transmissibility of an aquifer.
2 Write the assumptions made in the analysis of steady radial flow into a well.
3 Determine the number of image wells and their locations when the well is bounded by two streams at right angles.
4 Briefly explain about sand model.
5 State Darcy's Law and its limitations.
6 What are the main objectives of geo physical surveys?
7 Describe the various methods of Well Development.
8 Define induced Recharge.
9 What are the sources of groundwater pollution?
10 What are the uses of analog models? Give the classification of analog models.

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11 (a) Explain various types of aquifers in detail.
(b) In a phreatic aquifer extending over 1 km^2, the water table was initially at 25m below ground level. Sometime after irrigation with a depth of 20cm of the water table rose to a depth of 24 m below ground level. Later $3x10^5$ m^3 of water was pumped out and the water table dropped to 26.2m below ground level. Determine Specific yield of aquifer and deficit in soil moisture before irrigation.

12 A pumping test was performed in a confined homogenous and isotropic aquifer of infinite areal extent. The constant pumping rate was 200 m^2/hr. The following drawdowns were observed in an observation well located at 500 m from the pumping well. Determine the aquifer parameters by Jacob's method.

Time(hrs)	0.1	0.6	1.6	5	16	100
Drawdown (m)	0.4	0.5	0.9	1.35	1.66	1.71

13 A 30 cm diameter well fully penetrates a confined aquifer of thickness 30m. When the well is pumped at a rate of 300 lit/minute, the steady state drawdown in the two observation wells located at 12m and 120 m distance from the pumping well are found to be 45 m and 0.15 m respectively. Calculate the permeability and transmissibility of the aquifer.

14 (a) Derive the basic differential equation of unsteady ground water flow in a confined aquifer. State clearly the assumptions made.
(b) What is the effect of partial penetration on the drawdown in the well?

OU - 1607 OU - 1607

15 (a) Explain the following in respect of geo-physical exploration methods by electrical resistivity method.
   (i) Wenner and schlumberger configuration of electrodes.
   (ii) Profiling and vertical electrical sounding.
   (b) Discuss the Remote sensing method used for Geophysical exploration.

16 (a) When actually sea water intrusion takes place? How would you locate the freshwater-seawater interface? Also discuss about the various methods, which are used to control seawater intrusion.
   (b) Explain the construction of deep wells.

17 (a) Discuss the quality of ground water in respect of physical and bacteriological standards.
   (b) Discuss the various methods of artificial ground water recharge.

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OU - 1607 OU - 1607

Code No. D-2178/AICTE

FACULTY OF ENGINEERING

B.E. (ECE) VI - Semester (AICTE) (Backlog) Examination, March / April 2022
Subject: Image and Video Processing
Professional Elective – I

Time: 3 Hours **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions. **(10 x 2 = 20 Marks)**

1 What is meant by illumination and reflectance?
2 Define weber ratio.
3 Write the 2D Hadamard transform [Forward and Inverse].
4 Write any four properties of 2D-DFF.
5 What are the effects of applying Butterworth low pass filter to the noisy image?
6 Specify the objective of image enhancement technique. What is contrast stretching?
7 Mention the drawbacks of inverse filtering.
8 Draw the model of image degradation process.
9 State the need for data compression.
10 What are the operations performed by error free compression?

PART – B

Note: Answer any five questions. **(5 x 10 = 50 Marks)**

11 (a) With neat diagram, explain the elements of visual perception.
(b) Explain the basic relationships between pixels.

12 (a) Find DCT transform for the given 2x2 image [3 6 ; 6 4].
(b) Explain K-L transform in detail.

13 (a) Explain how an image can be enhanced using low pass filtering in frequency domain.
(b) Distinguish between spatial domain techniques and frequency domain techniques of image enhancement.

14 (a) Explain Spatial domain techniques.
(b) Explain Homomorphic filtering.

15 (a) Explain image degradation model/restoration process in detail.
(b) Write about Wiener Filter.

16 (a) What is edge detection? Describe in detail about the types of edge detection operation.
(b) Explain about Sobel edge Detector.

17 (a) Explain Bit Plane Slicing.
(b) What is histogram? Explain histogram equalization.

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OU - 1607 OU - 1607