AR16

CODE: 16CE3020   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July-2019

ADVANCED DESIGN OF CONCRETE STRUCTURES
(Civil Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. What are different types of failures in retaining walls? Discuss the steps involved in stability analysis of retaining walls? Why retaining walls are usually designed for active earth pressure?   14M

(OR)

2. A clayey backfill carries a surcharge of intensity 40kn/m^2 and the bulk density of the material 18 kN/m^3 what is the passive earth pressure developed per meter length of a 5m high retaining wall which is pushed toward the backfill if the top of the retaining wall is level with the top of backfill assume C=25kn/m^2 and $\phi = 30^0$ for the material of the backfill find also the point of application of resultant force?   14M

UNIT-II

3. An Open tank 4m x 3m x 2.5m deep rests on firm ground. Design the tank use M20 and mild steel reinforcement?   14M

(OR)

4. A circular water tank has an internal diameter of 12 m with 4 m depth of water. The walls of the tank are restrained at base. The tank rests on the ground. Design the tank by using M20 grade concrete and Fe 415 Reinforcement?   14M

UNIT-III

5. Design an interior panel of a flat slab 4.5mX6.0m without drop or column head. The storey height above and below the slab is 4m. Consider the live load as 4kN/m2. The size of column is 300mmX400mm. Use M20 and Fe 415   14M

(OR)

6. A flat slab is supported on 750 mm diameter circular columns   14M
   spaced 4m x 6m apart in both the directions. The column head
   has a diameter of 1300 mm with a height of 400mm and the live
   load on the flat slab is 8kN/m^2. Design the slab and determine
   moments in the flat slab along its 6m direction?

UNIT-IV

7. A column 300 mm x 300 mm in section stands on a pile cap   14M
   supported on **three** piles. The column is situated at the centroid of
   the pile group. The total load transferred to the column is 600 kN.
   The plies are 1.2 m centre to centre. Design the pile cap. Use
   M20 Concrete and Fe415 steel?

(OR)

8. A pile is likely to be subjected to a permanent load of 400 kN. It   14M
   was proposed that a set corresponding to a resistance of 800 kN is
   to be obtained. The pile section is 300 mm x 300mm and is 15 m
   long.

UNIT-V

9. Explain about Structural Ductility in detail? Explain about the   14M
   requirement of ductility?

(OR)

10. A 10-Storeyed RCC special moment-resisting frame (SMRF)   14M
    conforming to ductile detailing provisions residential building
    with importance factor 1, is in zone V. the height of each story is
    3m. The area of each floor is 576m^2 with the dead load as
    2kN/m^2 . the live load on each floor is 3kN/m^2 and the live load
    on roof is 1.5kN/m^2 . the structure is on medium soil. The
    damping in the structure is estimated to be 8.5% Determine the
    design seismic forces on the structure by equivalent static force
    method.

AR16

CODE: 16CE3021   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July-2019
INDUSTRIAL WASTE AND WASTE WATER MANAGEMENT
(Civil Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) What are the factors that influence the characteristics of Industrial waste water?   6M
   b) Explain various volume reduction methods that are adopted in the management of industrial waste water.   8M

(OR)

2. a) Write a detailed note on various treatment methods adopted for industrial waste water.   6M
   b) What is meant by equalization? What is the purpose of equalization? What are the methods of equalization and explain any two methods of mixing.   8M

UNIT-II

3. a) Write a note on recirculation of industrial wastes with suitable examples.   6M
   b) Briefly explain the circumstances under which joint treatment of industrial and municipal waste water is recommended. What are the limitations of such joint treatment?   8M

(OR)

4. a) Explain the consequent problems of disposing industrial waste water into surface sources.   8M
   b) What are the differences between municipal and industrial waste water?   6M

UNIT-III

5. a) Discuss the sources and characteristics of tannery waste water.   6M
   b) Explain methods for treatment of tannery waste water with suitable flow sheets.   8M

(OR)

6. a) Explain various treatment options available for dairy waste water.   5M
   b) Discuss the following in case of pulp and paper industry waste water"   9M
      i) Colour removal   ii) Biological treatment

UNIT-IV

7. Enumerate major operations in an integrated steel plant. Describe treatment methods for waste water from the following units of steel plant: 14M
   i) Coke oven ii) Rolling mills iii) Power plant and iv) Pickling unit

(OR)

8. a) Discuss the origin and characteristics of antibiotic wastes.   6M
   b) Describe treatment methods for sugar mill waste water. Give suitable flow sheets.   8M

UNIT-V

9. a) Describe the treatment steps involved in CETP.   6M
   b) Explain the concept of Common Effluent Treatment Plant and discuss the advantages.   8M

(OR)

10. a) What are the limitations of Common Effluent Treatment Plants?   8M
    b) Write a note on effluent disposal methods.   6M

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AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July-2019

ELECTRICAL DISTRIBUTION SYSTEMS
(Elective-I)
(Electrical and Electronics Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a)   Define the following:
        i. Diversity factor   ii. Coincidence Factor
        iii. Load diversity   Iv .Contribution factor
   b)   Discuss in detail the factors which influence the selection of primary feeder rating

   (OR)

2. a)   Explain the Radial type distribution system with the help of the neat sketch.
   b)   Derive the relationship between load factor and loss factor.

UNIT-II

3. a)   Discuss the factors affecting selection of location of substations
   b)   Compare four feeder and Six feeder patterns

   (OR)

4. a)   Derive the expression for % voltage drop for square shaped service area
   b)   List the benefits derived through optimal location of substations.

UNIT-III

5. a)   Prove the power loss due to load currents in the conductors of the 2-phase, 3 wire lateral with multi-grounded neutral is approximately 1.64 times larger than the one in the equivalent 3-phase   lateral
   b)   Derive an approximate voltage drop & power loss equation of primary feeder and give the condition for load p.f. at which voltage drop is maximum

   (OR)

6   Write about non - three phase primary lines

UNIT-IV

7. a)   List out the steps involved in the coordination process
   b)   Explain the data required for coordination procedure

   (OR)

8. a)   Explain about line sectionalize
   b)   Explain RECLOSER-TO-RECLOSER coordination

UNIT-V

9.   Explain the procedure employed to determine the best capacitor location

   (OR)

10.   Explain about series and shunt compensation in detail with neat diagram

AR16

CODE: 16ME3022   SET-2
ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July-2019
REFRIGERATION AND AIR CONDITIONING
(Elective - I)
(Mechanical Engineering)

Time: 3 Hours   Max Marks: 70

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Give a brief description of an ideal cycle of air refrigeration.
   b) A refrigeration plant working on Bell - Coleman cycle maintains a refrigeration temperature of - 15^0C and compresses the air from 1 bar to 7 bar with an index of compression 1.3. Heat from the compressed air is then removed such that the air cooled to 30^0C before expansion. The index of expansion is 1.35 calculate:
   (a) The ideal COP
   (b) Quantity of air circulated per minute so as to manufacture the ice at the rate of 2 metric tons per day from water available at 30^0C.
   (c) What is the capacity of the plant then in tons of refrigeration?
   For air cp 1.05 kJ/kgK, γ = 1.4, latent heat of fusion of ice at 0^0C is 335 kJ/kg, Cp of water = 4.1868 kJ/kgK.

(OR)

2. a) Differentiate between simple air refrigeration system and bootstrap air refrigeration system.
   b) An air-refrigerator works between pressure limit of 1 bar and 4 bar. The temperature of the air entering the compressor is 15^0C and entering the expansion cylinder is 30^0C. The expansion cylinder is 30^0C. The expansion follows the law $pv^{1.25}$=constant. The compression follows the law $pv^{1.35}$=constant. Take for air C_P = 1kJ/kg-K, C_V = 0.7 kJ/kg-K
   Find the following:
   i. C.O.P. of the refrigerating cycle.
   ii. If air circulation through the system is 25 kg/min, find the refrigeration capacity of the system.

UNIT-II

3. a) What is the effect of super heating and sub cooling of refrigerants?
   b) A food storage requires a refrigeration system of 12 tons capacity at an evaporator temperature of -10^0C and condenser temperature 25^0C. The refrigerant NH_3 is sub-cooled by 5^0C before passing through throttle valve. The vapour leaving the evaporator coil is 0.97 dry. Find the C.O.P. and power required to run the plant. Neglect all losses.

(OR)

4. a) Explain the working of a simple vapour compression system with the help of a schematic diagram.

   b) A refrigeration plant using F-22 produces 1000 kg of ice at -10^0C from water at 40^0C per hour. The ambient temperature is 40^0C and temperature in the refrigerator is -20^0C. The refrigerant enters the compressor at 100^0C. **Find** (a) COP of the cycle (b) refrigeration load (c) mass flow rate of refrigerant (d) Power consumption.

UNIT-III

5. a) Explain the Electro-lux refrigeration system with a neat sketch. What is the purpose of hydrogen in it?

   b) Draw a neat diagram of lithium bromide water absorption system and explain its working. List the major field of applications of this system.

(OR)

6. a) Mention the function of each fluid in a three-fluid vapour absorption system.

   b) In an absorption type refrigerator, the heat is supplied to NH_3 generator by condensing steam at 2 bar and 90% dry. The temperature in the refrigerator is to be maintained at $-5\ ^0$C. Find the maximum COP possible. If the refrigerator load is 20 tonnes and actual COP is 70% of the maximum COP, find the mass of steam required per hour. The temperature of the atmosphere as $30\ ^0$C.

UNIT-IV

7. a) Explain the working principle of thermo-electric refrigeration systems. Explain the following
   i. Seeback effect   ii. Peltier effect

   b) What are the advantages and limitations of a vortex tube refrigeration system?

(OR)

8. a) Describe working principle of pulse tube system.

   b) Why vortex tube refrigeration system is suitable for mining operations?

UNIT-V

9. a) Why ventilation is required? Explain why different ventilation standards for different purposes are recommended.

   b) Atmospheric air at a pressure of 1.01325 bar and a dry bulb temperature of 25^oC has a relative humidity of 75%. Calculate (i) partial pressures of water vapor and dry air, (ii) specific volumes of water vapor and dry air, (iii) dew point temperature and specific humidity of air and (iv) degree of saturation of air.

(OR)

10. a) What are the important considerations in the design of an air conditioning system?

    b) Outdoor air at 24^0C DBT and 15^0C WBT passes through air washer in which water is recirculated. The washer has humidifying efficiency of 70%. It is then heated by a coil with coil surface temperature of 27^0C and by pass factor of 0.3. Find DBT and RH of air leaving the heater and also find capacities of humidifier and heating coil if the circulation of outdoor air is 50 m^3 per minute.

AR16

CODE: 16ME3025   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July-2019
ROBOTICS
(Elective - I)
(Mechanical Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain the major components of a robot.	7M
	b)	Explain the classification of robots based on control methods.	7M

(OR)

2.	a)	What are End Effectors? Explain about mechanical grippers with figures.	7M
	b)	Discuss the types of grippers with the help of neat sketches. Also mention their applications.	7M

UNIT-II

3.	a)	Explain briefly the classification of Actuators.	7M
	b)	Differentiate between Pneumatic and Hydraulic Actuators.	7M

(OR)

4.	a)	Write a short notes on Non Optical Position sensors and potentiometers with Figures	7M
	b)	Differentiate between absolute and incremental encoders.	7M

UNIT-III

5.	a)	Explain Homogeneous Transformation Matrices for 2D and 3D.	7M
	b)	Derive forward & inverse kinematics equations of manipulator for a particular position.	7M

(OR)

6.	a)	What is D-H Matrix ? Derive Denavit Hartenberg Matrix.	7M
	b)	Determine the rotational matrix for rotation of 45^0 about y-axis, followed by a rotation of 120^0 about z-axis, then rotation of 90^0 about x-axis	7M

UNIT-IV

7.	a)	Explain the types of Trajectory ?	7M
	b)	Explain the steps involved in Trajectory Planning?	7M

(OR)

8.	a)	Define Robot Programming. Explain the two methods of Robot Programming	7M
	b)	Using VAL Language, discuss the basic commands and explain the structure of the program for a typical pick and place operation.	7M

UNIT-V

9.	a)	Explain briefly about Robot Centered Workcell	7M
	b)	What are the factors need to be considered while designing Robot work cell.	7M

(OR)

10.	a)	Explain the non-manufacturing applications of Robots.	7M
	b)	What are the future applications of robots.	7M

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July-2019

TELECOMMUNICATION SWITCHING SYSTEMS
(Elective –I)
(Electronics and Communication Engineering)

Time: 3 Hours   Max Marks: 70

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain In Detail the Need for Telecommunication Network	7M
	b)	Explain the combination switching and its advantages	7M
		(OR)	
2.	a)	Give a brief description of switching network configurations	7M
	b)	Give a brief description Simple telephone communications	7M

UNIT-II

3.	a)	Explain in detail time multiplexed space switching	6M
	b)	Compare micro programmed control and hard-wired control	8M
		(OR)	
4.		Explain the operation of centralized SPC architecture with neat sketches	14M

UNIT-III

5.	a)	Briefly explain In channel signalling.	6M
	b)	Explain Grade of Service and Blocking probability	8M
		(OR)	
6.	a)	Explain the attenuation limits in Subscriber loop system	7M
	b)	Discuss the charging plan for Telecommunication Service.	7M

UNIT-IV

7.	a)	Describe the Data communication circuit configurations.	6M
	b)	Draw the simplified block diagram of a data communication network and explain.	8M
		(OR)	
8.	a)	Discuss the Serial and Parallel Data transmission	7M
	b)	Explain the need for layered network architecture	7M

UNIT-V

9.	a)	Write about Broadband ISDN and explain the BISDN configuration.	8M
	b)	Compare circuit switching and packet switching techniques.	6M
		(OR)	
10.		Explain the B-ISDN functional module interconnections with neat diagram and write the Broadband channel rates.	14M

AR16

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July-2019
DATA WAREHOUSING AND DATA MINING
(Common to CSE & IT)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. Discuss in detail about the major issues in Data Mining and its functionalities.   14M

(OR)

2. a) What is data pre-processing? Explain why it is essential to pre-process the data before   7M
   mining.
   b) Explain in detail about various pre-processing techniques.   7M

UNIT-II

3. a) What is multi-dimensional data model? Explain its concept.   5M
   b) Differentiate ROLAP, MOLAP, and HOLAP.   9M

(OR)

4. a) Define concept Hierarchy. Explain its concept.   7M
   b) Compare data warehouse with database system.   7M

UNIT-III

5. Describe the following with examples.   14M
   i) Frequent itemset   ii) closed itemset   iii) Support & Confidence

(OR)

6. a) Define association rule. Write and explain Apriori algorithm with a suitable   9M
   example.
   b) Explain how to improve the performance of Apriori algorithm.   5M

UNIT-IV

7. a) What is tree pruning? Explain various pruning techniques.   7M
   b) Explain about the methods used to measure the performance of the classifier.   7M

(OR)

8. a) How the classification is different from Prediction?   6M
   b) Write short notes on decision tree induction (DTI)   8M

UNIT-V

9. a) Discuss about different data types used in cluster analysis.   8M
   b) Differentiate Agglomerative and Divisive Clustering.   6M

(OR)

10. Explain the following clustering techniques.   14M
    i) K-Means   ii) DBSCAN

AR13

CODE: 13CE3021   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July-2019

INDUSTRIAL WASTE AND WASTEWATER MANAGEMENT
(Civil Engineering)

Time: 3 Hours   Max. Marks: 70

PART-A

ANSWER ALL QUESTIONS   **[1 x 10=10 M]**

1. a) Define Bio-medical Waste.

    b) Name any two Physical and Chemical Properties each of Industrial Effluents.

    c) Give an example for volume reduction in Industrial wastewater management.

    d) What is the purpose of 'equalisation' of Industrial wastes?

    e) Identify any two problems with discharging Industrial effluents to lakes.

    f) Can municipal wastewater be used in Industries? How?

    g) What is 'lignin' and how is it a problem in treating paper pulp mill effluents?

    h) What is 'whey'? Name some of the useful byproducts made in Dairy industry?

    i) Identify any place in India where common effluent treatment plants are operating.

    j) Identify any one approved method for disposal of CETP effluent in India.

PART-B

Answer one question from each unit   **[5x12=60M]**

UNIT-I

2. a) How do the Organic and Biological characteristics of industrial effluent affect the cost of treatment?   **6M**

    b) Compare and contrast Hazardous and Non-Hazardous waste from Industries.   **6M**

(OR)

3. What are the principles of Industrial Waste Treatment?   **12 M**

UNIT-II

4.   Explain basic theories of Industrial Waste Management.   **12 M**

(OR)

5. a) Explain any three neutralisation methods (each) for acidic and basic effluents.   **6 M**

    b) Explain any six strategies for volume reduction in industrial wastewater.   **6 M**

UNIT-III

6.   What is recirculation of Industrial wastewater? Why and when is it adopted?   **12 M**

(OR)

7.   Identify and discuss the issues with direct discharge of industrial effluents into natural water bodies. Take examples from current affairs and in the Indian context.   **12 M**

UNIT-IV

8. a) What are coal washeries in a Steel Plant. Explain the characteristics of its effluent and how it is treated.   **6 M**

    b) What is a tannery? How are raw hides processed? Explain the characteristics of tannery effluent.   **6 M**

(OR)

9. a) Explain briefly how Beer, Wine, Whisky and Brandy are made. What is the role of distillation in making these beverages. What are characteristics of effluents?   **8 M**

    b) What is the difference between a generic drug and a brand-name drug? What are bulk drugs and formulations in Pharmaceutical Industry?   **4 M**

UNIT-V

10.   Explain the step by step process of setting up a Common Effluent Treatment Plant for a group of diverse industries. What is the formula for success of its operation?   **12 M**

(OR)

11.   Explain the methods which are used for disposal of treated effluents.   **12 M**

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AR13

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July-2019

PRESTRESSED CONCRETE
(Civil Engineering)

Time: 3 Hours　　　　　　　　　　　　　　　　　　　　　　　Max Marks: 70

PART-A

ANSWER ALL QUESTIONS　　　　　　　　　　　　　　　　　　　[1 x 10 = 10 M]

1. a) What do you understand about pre stressing?
   b) What are the principles of pre stressing?
   c) Write about the terms (a) Tendon (b) Anchorage
   d) What do you understand about the necessity of using high strength concrete and steel for
   e) What are the main advantages of pre stressed concrete?
   f) Write about (a) Bonded pre stressed concrete (b) Non bonded pre stressed
   g) What do you understand about Axial Pre stressing?
   h) What do you understand about term Transfer?
   i) What do you understand about Transmission length?
   j) List the types of losses of pre stress.

PART-B

Answer one question from each unit　　　　　　　　　　　　　　　[5x12=60M]

UNIT-I

2. a) What are the general principles of pre-tensioning and post-tensioning?
   b) What are the methods and systems of pre-tensioning and post tensioning? Explain them in detail.

(OR)

3. a) What are the types of pre stressing systems and write down the applications
   b) Explain about Fressinet system with neat sketch.

UNIT-II

4. a) Explain about loss of pre stress due to elastic deformation & shrinkage.
   b) A concrete beam is pre stressed by a cable carrying an initial pre stressing force of 300 kN. The cross sectional area of the wires in the cable is 300 mm^2. Calculate the % of loss of stress in the cable only due to Shrinkage of concrete using IS:1343 recommendations assuming the beam to be a pre tensioned and post tensioned, Assume E for steel 210 kN/mm^2

5. A rectangular concrete beam of 100 mm wide by 250 mm deep spanning over 8 m is Pre stressed by a straight cable carrying an effective pre stressed force of 250 kN located at an eccentricity of 40 mm the beam supports a live load of 1.2 kN/m. Calculate the resultant stress distribution for the center-of-span cross section of the beam assuming the density of concrete as 24 kN/m^3 and also calculate the magnitude of the pre stressing force with an eccentricity of 40 mm which can balance the stresses due to dead load and live loads at the soffit of centre of the section

UNIT-III

6. The support section of a pre stressed concrete beam, 230 mm × 450 mm is required to support an ultimate shear force of 150 kN. The compressive pre stress at the centroidal axis is 7.5 N/mm^2. The characteristic cube strength of concrete is 30 N/mm^2. The cover to the tension reinforcement is 50 mm. if the characteristic tensile strength of stirrups is 415 N/mm^2, Design suitable shear reinforcement using IS code.

(OR)

7. The girder is used over an effective span of 25 m. The tendons with a cross section of 2300 mm^2 are parabolic with an eccentricity of 650 mm at the centre of the span and 285 mm at the support section. The effective pre stress in the tendon is 900 N/mm^2 after all losses. If the tensile strength of concrete is 1.6 N/mm^2, estimate the ultimate shear resistance of the support section, and the maximum permissible uniformly distributed working load on the beam using an overall load factor of 2.

UNIT-IV

8. A pre tensioned beam of 8 m span has a symmetrical I-section. The flanges are 200 mm wide and 600 mm thick. The web thickness is 80 mm and the overall depth of girder is 400 mm. The member is pre stressed by 8 wires of 5 mm diameter located on the tension side such that the effective eccentricity is 90 mm. The initial stress in the wires is 1280 N/m^2 and the cube strength of concrete at transfer is 42 N/m^2. Determine the maximum vertical tensile stress developed in the transfer zone.

(OR)

9. A composite T-beam is made up of a pre-tensioned rib of 120 mm wide and 210 mm deep, and a cast in situ slab 420 mm wide and 130 mm thick having a modulus of elasticity of 28 kN/mm^2. If the differential shrinkage is 90×10^{-6} units, determine the shrinkage stresses developed in the precast and cast in situ units.

UNIT-V

10. a) Explain the importance of control of deflections.
    b) What are the influencing factors on deflections?
(OR)
11. Explain the short term and long deflections of pre stressed concrete

AR13

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July-2019
H.V.D.C. TRANSMISSION
(Electrical and Electronics Engineering)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   **[1 x 10 = 10 M]**

1. a) Classify the types of DC link?
    b) Draw the schematic diagram of three & two valve conduction mode.
    c) Define extinction angle control?
    d) Explain Starting of DC link.
    e) Draw the DC system model.
    f) What is the function of shunt capacitors in HVDC station?
    g) Describe about smoothing reactors in HVDC station.
    h) Effect of Audible noise on DC lines.
    i) List the components present in AC filter.
    j) Write the characteristics of Harmonics?

PART-B

Answer one question from each unit   **[5x12=60M]**

UNIT-I

2. a) Explain in detail the superiority of technical performance of HVDC lines to that of HVAC lines?   6M
    b) Draw a typical HVDC layout and explain their basic components?   6M

(OR)

3. a) Clarify with neat circuit diagram, operation of the 3-phase twelve pulse bridge rectifier and analyze the waveforms   8M
    b) List the various application of HVDC transmission system?   4M

UNIT-II

4. a) Discuss about the principles of DC link control.   6M
    b) Illustrate the process of power reversal in HVDC system.   6M

(OR)

5. State and explain various types of firing angle control schemes in HVDC converter control.   12M

UNIT-III

6. Draw the flow chart for AC/DC load flow and also Explain the sequential method for AC-DC power flow.   12M

(OR)

7. What is the reactive power requirement in steady state and Discuss the various sources of reactive power for HVDC converters.   12M

UNIT-IV

8. Discuss in detail about the over voltage protection and over current protection of converters.   12M

(OR)

9. a) Describe the operation of surge arresters for converter protection.   6M
    b) What do you mean by the following terms?   6M
       1) Arc backs   2) Miss fire   3) Arc through   4) Commutation failure`

UNIT-V

10. a) Explain the effect of Pulse number on harmonics.   4M
    b) What are the non-characteristics of harmonics in HVDC system? How are they generated?   8M

(OR)

11. Give a detailed account of design aspects of following filters   12M
    (a) Single tuned filter   (b)Double tuned filter

AR13

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July-2019

OPERATIONS RESEARCH
(Mechanical Engineering)

Time: 3 Hours   Max Marks: 70

PART-A
ANSWER ALL QUESTIONS   **[1 x 10 = 10 M]**

1. a) What are the phases of operations research
    b) Define linear programming problem
    c) What is transportation problem
    d) How assignment problem is a special case of transportation problem?
    e) What are characteristics of queuing system
    f) What is the idle time in job sequencing
    g) What is minimax criterion of optimality?
    h) Briefly explain present worth factor
    i) Define Saddle point.
    j) What are Different kinds of floats of floats used in network analysis?

PART-B

Answer one question from each unit   **[5x12=60M]**
UNIT-I

2. In the production of 2 types of toys, a factory uses 3 machines A, B and C. The time required to produce the first type of toy is 6 hours, 8 hours and 12 hours in machines A, B and C respectively. The time required to make the second type of toy is 8 hours, 4 hours and 4 hours in machines A, B and C respectively. The maximum **12M** available time (in hours) for the machines A, B, C are 380, 300 and 404 respectively. The profit on the first type of toy is 5 dollars while that on the second type of toy is 3 dollars. Find the number of toys of each type that should be produced to get maximum profit.

OR

3. Solve the following LPP by Big-M method.
    Max $Z = -2x_1 - x_2$ Subject to $3x_1 + x_2 = 3$; $4x_1 + 3x_2 \geq 6$ $x_1 + 2x_2$ **12M**
    ≤ 4; and $x_1 \geq 0, x_2 \geq 0$

UNIT-II

4. Solve the assignment problem represented by the following matrix.   **12M**

	Job			
Person	**1**	**2**	**3**	**4**
A	20	25	22	28
B	15	18	23	17
C	19	17	21	24
D	25	23	24	24

(OR)

5. Find the optimum solution to the following transportation problem.   **12M**

		A	B	C	D	availability
	I	3	2	4	1	20
	II	2	4	5	3	15
From	III	3	5	2	6	25
	IV	4	3	1	4	40
	requirement	30	20	25	25	100

UNIT-III

6. There are four jobs each of which has to go through the machines M_i, i=1,2,...,6 in the order $M_1, M_2,..., M_6$. Processing times are given below.   **12M**

	Machine(i)					
Jobs(j)	M_1	M_2	M_3	M_4	M_5	M_6
J_1	20	10	9	4	12	27
J_2	19	8	11	8	10	21
J_3	13	7	10	7	9	17
J_4	22	6	5	6	10	14

Determine a sequence for these four jobs which minimizes the total elapsed time, also find the total elapsed times and idle times of each machine.

(OR)

7. Arrivals at a telephone booth are considered to be poisson, with **12M**
    an average time of 10 minutes between one arrival and the next.
    The length of a phone call assumed to be distributed
    exponentially with mean time 3 minutes. Then,

    (a) What is the probability that a person arriving at the booth
    will have to wait?
    (b) What is the average length of the queue that form from time
    to time?
    (c) The telephone department will install a second booth when
    convinced that an arrival would expect to have to wait at least 3
    minutes for the phone. By how much must the flow of arrivals
    be increased in order to justify a second booth?

UNIT-IV

8. A mill owner finds from his past records the costs of running **12M**
    a machine whose purchase price is Rs.6000 are as given
    below.

Year	1	2	3	4	5	6	7
Running cost (Rs.)	1000	1200	1400	1800	2300	2800	3400
Resale value (Rs.)	3000	1500	750	375	200	200	200

    Determine at what age is a replacement due?
                            (OR)
9.(a) Use dominance principle to reduce the following game **8M**
       to 2 X 2 games and hence

                Solve it. $\begin{bmatrix} 3 & 5 & 4 & 2 \\ 5 & 6 & 2 & 4 \\ 2 & 1 & 4 & 0 \\ 3 & 3 & 5 & 2 \end{bmatrix}$

   (b) Explain Minimax and Maximin principle used in theory **4M**
        of games

10 A project consists of a series or tasks labeled A,B,C **12M**
.....H,I   with the following relationships (W < X,Y means X and Y cannot start until   W is completed, X,Y<W cannot start until both X and Y are completed). With this notation, construct the network diagram having the following constraints: A<D,E ; B,D<F ; C<G ; B<H ; F,G<I . Find also the optimum time of completion of the project, when the time (in days)of completion of each task is as follows

Task	A	B	C	D	E	F	G	H	I
Time	23	8	20	16	24	18	19	4	10

(OR)

11(a) Distinguish between PERT and CPM   6M
  (b)   What are the common errors in drawing Networks?   6M

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July-2019
DATA WAREHOUSING AND DATA MINING
(Common to CSE & IT)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) Define Association Rule Mining
    b) What are the different similarity measures in Data Mining
    c) List the Data classification algorithms used in Data Mining
    d) Relate Charaterization and Comparisons in mining
    e) State the importance between Data Warehousing and Data Mining
    f) What are the data mining tasks
    g) Defne Candidate Generation
    h) Name specific techniques of cluster analysis
    i) Write about Agglomerative Hierarchical Clustering
    j) What is Tree Pruning

PART-B

Answer one question from each unit   [5x12=60M]
UNIT-I

2. a) Illustrate and outline the preprocessing techniques   8
    b) Describe motivational challenges of Data Mining   4
                                (OR)
3. a) Demonstrate similarity measures and dissimilarity measures between simple   6
        attributes
    b) Describe briefly Jaccard coefficient and Extended Jaccard Coefficient with 6
        examples

UNIT-II

4. a) Explain Data Warehouse Architecture   6
    b) Discuss different types of operations performed at OLAP   6
                                (OR)
5. a) Explain Data Generalization and Summarization-based characterization   6
    b) Discuss in detail about Analytical Characterization   6

UNIT-III

6. a) Discuss briefly about Candidate generation, Rule generation and Frequent item-set   6
        generation.
    b) Explain brute force method through candidate generation and pruning   6
                                (OR)
7. a) Explain support counting using Hash tree   6
    b) Explain FP-tree representation   6

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UNIT-IV

8. a) Explain classification by Decision tree Induction with example   6
   b) Explain Rule-based classification with example   6
   (OR)
9. a) Discuss classification by Prediction, Accuracy and Error Measures   6
   b) Explain the issues of classification and prediction   6

UNIT-V

10. a) Explain the additional issues of K-means   6
    b) Compare Kmeans and DBSCAN clustering algorithms   6
    (OR)
11. a) Demostrate agglomerative hierarchical clustering with strengths and weaknesses   6
    b) what are the Cluster characteristics and Explain different types of clusters   6

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