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**R18**

Course Code: C30166



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

B.Tech IV Semester Regular/Supplementary Examinations August-2023

Course Name: **BUSINESS ETHICS & CORPORATE GOVERNANCE**

(Common for EEE, ECE, CSE, IT, CSC, CSM, CSD, AID & AIM)

Date: 07.08.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. Can business ethics be taught and trained? 2 M
2. Write in short about moral development. 2 M
3. Ethics in HRM. 2 M
4. Ethics of health care services. 2 M
5. Cyber space. 2 M
6. Ethical dimensions of cyber crimes. 2 M
7. Does good governance really matters to corporations? 2 M
8. Write in short about Board committees. 2 M
9. Corporate risk. 2 M
10. Effective corporate governance frame work. 2 M

**PART-B**

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Discuss the five myths about business ethics. 10M
- OR**
11. B). Explain the kohlberg's study and carol Gilligan's theory. 10M
12. A). Explain the ethics of finance and accounting professionals. 10M
- OR**
12. B). Elaborate the concept of ethics of media marketing and ethical dilemma. 10M
13. A). Discuss the social, political issues in the cyber space. 10M
- OR**
13. B). Discuss mindset and skills of hackers and other criminals. 10M
14. A). Explain the corporate governance in India-board structures. 10M
- OR**
14. B). Explain the process and evaluation of corporate governance. 10M
15. A). Discuss role of corporate governance in managing the risks. 10M
- OR**
15. B). Explain the internal auditing's role in corporate governance. 10M

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**R18**

Course Code: A30473



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

B.Tech IV Semester Regular/Supplementary Examinations August-2023

Course Name: **IMAGE PROCESSING**

(Common for CSE, IT, CSC, CSM, CSD, AID & AIM)

Date: 07.08.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

- |   |     |
|---|-----|
| 1. What is meant by sampling and quantization in an image?                                  | 2 M |
| 2. Find the 2D-DCT of the matrix $f(m, n) = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ . | 2 M |
| 3. What do you mean by point processing?  | 2 M |
| 4. Define spatial filtering.  | 2 M |
| 5. Draw the block diagram of degradation model and write the equation for it.               | 2 M |
| 6. What is meant by point spreading function in image degradation?                          | 2 M |
| 7. Why Laplacian of gaussian edge detector is preferred than other edge detectors?          | 2 M |
| 8. What is a hit-or-miss transform?   | 2 M |
| 9. What is the need for image compression?  | 2 M |
| 10. Mention the classification of image compression methods.                                | 2 M |

**PART-B**

Answer the following. Each question carries TEN Marks.

5x10=50M

- |   |     |
|---|-----|
| 11.A). Explain various neighbors, adjacency and distance measure between the pixels.  | 10M |
| <b>OR</b>   |     |
| 11. B). i) Mention the different properties of 2D-DFT.Explain any two of them.  | 6M  |
| ii) Compute the Hadamard Transform matrix for N=4.  | 4M  |
| 12. A). Justify the statement "Median filter is an effective tool to minimize salt-and -pepper noise" with suitable example | 10M |
| <b>OR</b>   |     |
| 12. B). i) Discuss about ideal high pass and Butter worth HPF.  | 6M  |
| ii) What is meant by image sharpening? Mention its types.   | 4M  |
| 13. A). Explain inverse filter used in image restoration. Mention its drawbacks.  | 10M |
| <b>OR</b>   |     |
| 13. B). Explain the iterative method of image restoration. Mention its advantages.  | 10M |
| 14. A). i) Explain about thresholding technique in image segmentation.  | 5M  |
| ii) Explain how regions are growing in region-based segmentation.   | 5M  |
| <b>OR</b>   |     |
| 14. B). i) Write the algorithms for Dilation and Erosion operations in image morphology.                                    | 5M  |
| ii) Mention the properties of opening and closing operations in image morphology.   | 5M  |

(P.T.O..)

15. A). A source emits four symbols {a, b, c, d} with the probabilities {0.4,0.2,0.1,0.3}. Construct arithmetic coding and decode the word 'DAD'. 10M

**OR**

15. B). Explain lossy predictive coding with suitable example. 10M

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**R18**

Course Code: A30559



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

B.Tech IV Semester Regular/Supplementary Examinations August-2023

Course Name: INTRODUCTION TO DATA SCIENCE

(Common for ECE, CSE, IT, CSC, CSM & AIM)

Date: 07.08.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. Elaborate the concept of Big Data. 2 M
2. Explain the concept of NumPy in Python. 2 M
3. Define the term Visualization of data. 2 M
4. Distinguish between Bar Charts and Line Charts. 2 M
5. Explain the importance of Naïve Bayes. 2 M
6. Illustrate the concept of K- nearest Neighbors Classifications with suitable example. 2 M
7. Briefly elaborate the importance of Deep Learning. 2 M
8. Examine the Induction rule in brief. 2 M
9. Demonstrate the application of Data Science in Weather Forecasting. 2 M
10. Analyze implementation of Data Science in the Stock Market. 2 M

**PART-B**

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Explain about Matplotlib Python Programming tool kit for data science. 10M
- OR**
11. B). Classify the important concepts of Web Scraping. 10M
12. A). Explain about Bar charts and line charts with suitable diagrams. 10M
- OR**
12. B). Compare and contrast the differences between Cleaning and Munging techniques. 10M
13. A). Compare and contrast the differences between Supervised and Unsupervised Learning. 10M
- OR**
13. B). Distinguish between Support Vector Machine and Logic regression. 10M
14. A). Outline the concept of Decision trees and random forest. 10M
- OR**
14. B). Interpret the concept of Neural Networks for problem solving. 10M
15. A). Illustrate the applicability of Object Recognition in Data Science with suitable example. 10M
- OR**
15. B). Classify the importance of Real Time Sentiment Analysis. 10M

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R18

Course Code: A30531



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

B.Tech IV Semester Regular/Supplementary Examinations August-2023

Course Name: PYTHON PROGRAMMING

(Common for EEE, ME, ECE, CSE, IT, CSC & CSM)

Date: 07.08.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. Identify the difference between the if, if-else, if-elif-else statements. 2 M
2. Outline the Characteristics of functions and modules. 2 M
3. What are local variable and how they are used? 2 M
4. Show the need of Void function. 2 M
5. Summarize about two dimensional Lists. 2 M
6. Discuss the need of Recursion. 2 M
7. Determine the Benefits of Instances. 2 M
8. Distinguish between Classes and Objects. 2 M
9. Classify the need of Turtle graphics. 2 M
10. How to use Widgets in python? 2 M

**PART-B**

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). i) Identify the most Commonly used Repetition structures in Python 5M  
ii) Write a Python program to convert height in feet and inches to cm. [1 feet = 12 inch and 1 inch= 2.54 cm] (Sample input: 2 feet 7 inch Sample output: 78.74 cm) 5M

**OR**

11. B). Summarize various operators, built-in functions and standard library modules that deals with python numeric type. 10M

12. A). i) Outline the declaration and calling of functions in Python? Illustrate with an example. 5M  
ii) Demonstrate the process of storing functions in Modules. 5M

**OR**

12. B). i) Write a Python program to print all prime numbers less than 256 using Functions 5M  
ii) What type of parameter passing is used in Python? Justify your answer with sample programs. 5M

13. A). i) Demonstrate the process finding items in Lists with the in Operator. 5M  
ii) Illustrate a Python program that counts the number of occurrences of a letter in a string, using dictionaries. 5M

**OR**

13. B). i) What is a list in Python? How to create nested lists? Demonstrate how to create and print a 3-dimensional matrix with lists. 5M  
ii) Write a python program to convert 'a, e, i, o, u' letters in a string with 'w, x, y, z, p' using string translate method. 5M

(P.T.O.)

14. A). i) Classify the Techniques for Designing Classes. 5M  
ii) Elaborate the implementation of hierarchical inheritance in Python, with a program. 5M

**OR**

14. B). i) Construct a python program to show the polymorphism in Python. 5M  
ii) How does Instances are created in python show with an example? 5M

15. A). i) Can you categorize the different widgets in GUI designing. 5M  
ii) Show the implementation of two dimensional shapes. 5M

**OR**

15. B). i) Elaborate the implementation of Radio Buttons, labels and Check Buttons in Python. 5M  
ii) How to Develop a python program to show Button widgets and Info Dialog boxes? 5M

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R18

Course Code: A30378



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

B.Tech IV Semester Regular/Supplementary Examinations August-2023

Course Name: WASTE TO ENERGY

(Common for EEE, ECE, CSE, CSD & AID)

Date: 07.08.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. Explain different types of MSW. 2 M
2. Define incinerator. 2 M
3. Define Syngas. 2 M
4. Explain about process of pyrolysis. 2 M
5. Classify various types of gasifiers. 2 M
6. Explain about Updraft gasifiers. 2 M
7. Explain about Biomass Stove. 2 M
8. Briefly discuss various types of Combustors. 2 M
9. List out applications of biogas plants. 2 M
10. Explain briefly about Bio-Chemical Conversion. 2 M

**PART-B**

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Discuss briefly about Agro based waste. 10M
- OR**
11. B). Explain various types of digestors for waste management briefly. 10M
12. A). Explain the manufacturing process of pyrolytic oils briefly. 10M
- OR**
12. B). Discuss Slow and Fast Pyrolysis methods. 10M
13. A). Draw Gasifier engine arrangement for production of Electric power and explain the methodology. 10M
- OR**
13. B). Explain the design, construction and operation of fluidized bed gasifier. 10M
14. A). Explain Design, Construction and Operation of Fixed bed combustor. 10M
- OR**
14. B). Explain the Design, Construction and Operation of Fluidized bed combustor with neat sketches. 10M
15. A). Discuss briefly about Biomass conversion processes. 10M
- OR**
15. B). Explain the operation of Inclined grate combustors. 10M

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**R18**

Course Code: A30007

**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

B.Tech IV Semester Regular/Supplementary Examinations August-2023

**Course Name: NUMERICAL TECHNIQUES & PROBABILITY DISTRIBUTIONS**  
(Common for CE, ME, CSE, IT, CSC & CSD)**Date: 09.08.2023 AN****Time: 3 hours****Max.Marks: 70**

(Note: Assume suitable data if necessary)

**PART-A**

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

**10x2=20M**

1. Find an iterative formula for  $\frac{1}{N}$ ,  $N > 0$  using Newton-Raphson method. 2 M
2. What is Lagrange's interpolation formula? 2 M
3. What is the order and error of Trapezoidal rule? 2 M
4. Find  $y(0.4)$  if  $\frac{dy}{dx} = x^2 - 2xy$ ,  $y(0) = 2$  with the assumption  $h = 0.25$  using Euler's method. 2 M
5. Find the Laplace transform of  $t \cosh at$ . 2 M
6. Find the inverse Laplace transform of  $\frac{1}{s(s^2+a^2)}$ . 2 M
7. If  $X$  is a discrete RV having the following probability distribution 2 M

$x$	1	2	3
$p(x)$	$k$	$k$	$k^2$

Find the value of  $k$ .
8. Find  $P(X = 2)$  if  $X$  is binomially distributed with mean 5 and standard deviation 2 2 M
9. What is meant by contingency table? 2 M
10. List any two uses of chi-square test. 2 M

**PART-B****Answer the following. Each question carries TEN Marks.****5x10=50M**

- 11.A). Determine the positive root of
- $x^3 - 4x - 9 = 0$
- by bisection method.
- 10M

**OR**

11. B). Use Newton's formula to estimate the polynomial
- $f(x)$
- satisfying the following data, and hence find the value of
- $f(4)$
- 10M

$x$	0	1	2	3
$f(x)$	1	2	1	10

12. A). Divide the range in to 6 equal parts, to find
- $\int_0^6 \frac{dx}{1+x^2}$
- using Trapezoidal and Simpson's rule. Compare with the actual integration.
- 10M

**OR**

12. B). Examine the value of
- $y(0.1)$
- ,
- $y(0.2)$
- if
- $\frac{dy}{dx} = x - y^2$
- ,
- $y(0) = 1$
- using Fourth order Runge-Kutta method (assume
- $h = 0.1$
- ).
- 10M

**(P.T.O.)**



13. A). Identify the Laplace transform of the "square wave" function  $f(t)$  is defined by 10M  

$$f(t) = \begin{cases} k & \text{if } 0 \leq t \leq a \\ -k & \text{if } a < t \leq 2a \end{cases} \text{ and } f(t + 2a) = f(t) \text{ for all } t.$$

**OR**

13. B). Solve  $y'' + 4y' + 3y = e^{-t}$  given  $y(0) = 1 = y'(0)$ , using Laplace transform. 10M

14. A). A random variable gives measurements  $X$  between 0 and 1 with probability density function  $f(x) = 12x^3 - 21x^2 + 10x, 0 \leq x \leq 1$ . Find the following: 10M

(i)  $P\left[X \leq \frac{1}{2}\right]$  and  $P\left[X > \frac{1}{2}\right]$

(ii) the value of  $k$  such that  $P[X \leq k] = \frac{1}{2}$ .

**OR**

14. B). Messages arrive at a switchboard in a Poisson manner at an average rate of six per hour. Find the probability for each of the following events: 10M

- i). Exactly two messages arrive within one hour
- ii). No message arrives within one hour
- iii). At least three messages arrive within one hour.

15. A). Test the significance of the difference between the means of the samples, drawn from two normal populations with same S.D. from the following data. 10M

	Size	Mean	S.D.
Sample-1	100	61	4
Sample-2	200	63	6

**OR**

15. B). The theory predicts that the proportion of beans in the four groups A, B, C and D should be 9 : 3 : 3 : 1. In an experiment among 1600 beans, the numbers in the four groups were 882, 313, 287 and 118. Do the experimental results support the theory? 10M

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**R18**

Course Code: A30511

**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

B.Tech IV Semester Regular &amp; Supplementary Examinations August-2023

Course Name: DESIGN &amp; ANALYSIS OF ALGORITHMS

(Common for CSE, IT, CSM, AID &amp; AIM)

Date: 11.08.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. How can we measure an algorithm's running time? 2 M
2. Define O-notation? Give one Example. 2 M
3. Find an optimal solution to the knapsack instance n=4 objects and the capacity of knapsack m=15, profits (10, 5, 7, 11) and weight are (3, 4, 3, 5). 2 M
4. State the Job – Sequencing Deadline Problem? 2 M
5. Give problem statement of graph coloring. 2 M
6. State the difference between FIFO and LC Branch and Bound algorithms. 2 M
7. Differentiate between breadth first search and Depth first search. 2 M
8. Give the problem statement of Prim's method and write Time complexity of Prim's Algorithm? 2 M
9. Differentiate between P and NP Classes. 2 M
10. Define NP Hard. 2 M

**PART-B**

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Using iteration method. 10M
- i) Solve  $T(n)=2T(n/2)+2$  if  $n>2$   
          =1 if  $n=2$
- ii) Solve  $T(n)=2T(\sqrt{n})+\log n$

**OR**

11. B). Solve using Masters theorem: 10M
- i)  $T(n)=2T(n/4)+n$
- ii)  $T(n)=7T(n/2)+n^2$

12. A). Construct the Huffman tree & resulting code word for the following set of values? Encode the words DAD & ADD. 10M

Character	A	B	C	D	--
Probability	0.35	0.1	0.2	0.2	0.15

**OR**

12. B). Let the dimensions of A,B,C,D respectively be 10X5, 5X15, 15X8, 8X20 generate matrix product chains that produces minimum number of matrix multiplications using dynamic programming. 10M

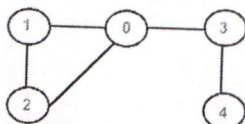
(P.T.O.)

13. A). Write an algorithm to determine the Hamiltonian cycle in a graph using backtracking. 10M

OR

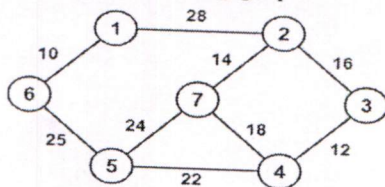
13. B). Explain the FIFO BB 0/1 Knapsack problem procedure with the knapsack instance for  $n=4$ ,  $m=15$ ,  $(p_1, p_2, p_3, p_4)=(10, 10, 12, 18)$ ,  $(w_1, w_2, w_3, w_4)=(2, 4, 6, 9)$ . Draw the portion of the state space tree and find optimal solution. 10M

14. A). Consider the following graph. If there is ever a decision between multiple neighbor nodes in the BFS or DFS algorithms, assume we always choose the letter closest to the beginning of the alphabet first. In what order will the nodes be visited using a Breadth First Search and Depth First Search with start vertex as 0? 10M



OR

14. B). Write down Kruskal's Algorithm for finding the Minimum Spanning Tree of a connected graph. Execute your algorithm on the following graph. 10M



15. A). i) Define NP- Hard and NP – Complete Problems. 5M  
 ii) What are the steps used to show a given problem is NP-Complete? 5M

OR

15. B). i) Explain Satisfiability problem 5M  
 ii) Explain min-max Search with suitable example. 5M

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**R18**

Course Code: A30525



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**

(UGC AUTONOMOUS)

B.Tech IV Semester Regular & Supplementary Examinations August-2023

Course Name: SOFTWARE ENGINEERING

(Common for CSE & IT)

Date: 14.08.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. List the task regions in the spiral model. 2 M
2. What are the fundamental activities of a software process? 2 M
3. Identify the non functional requirements? 2 M
4. Interpret the need of feasibility study. 2 M
5. Discuss about the design process. 2 M
6. Formulate the purpose of software design quality? 2 M
7. What is black box testing? 2 M
8. What is meant by debugging? 2 M
9. Elaborate the quality concepts. 2 M
10. Distinguish between reactive risk and proactive risk strategies. 2 M

**PART-B**

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Summarize the following: 10M  
i) Water fall model    ii) Unified Process Model
- OR**
11. B). i) Discuss about the changing nature of software. 2M  
ii) Develop a detailed notes on CMMI. 8M
12. A). Examine the activities of requirements elicitation and analysis? Explain. 10M
- OR**
12. B). i) What is the goal of requirements analysis phase? Give reasons why the requirements analysis phase is a difficult one. 5M  
ii) Outline the models used for structured analysis 5M
13. A). Construct Conceptual Model of UML. 10M
- OR**
13. B). Explain any five design concepts. 10M

(P.T.O.)

14. A). Analyse clearly about metrics for design model and source code. 10M

**OR**

14. B). i) Summarize the metrics used for software maintenance. 5M  
ii) Briefly discuss about Integration testing strategies. 5M

15. A). i) What do you mean by risk management? Explain how to select the best risk reduction technique when there are many ways of reducing a risk? 5M  
ii) Justify the need of formal technical reviews. 5M

**OR**

15. B). Determine the process of software configuration management. 10M

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R18

Course Code: A30228



**CMR COLLEGE OF ENGINEERING & TECHNOLOGY**  
(UGC AUTONOMOUS)

B.Tech IV Semester Regular/Supplementary Examinations August-2023

Course Name: **BASIC ELECTRICAL ENGINEERING**

(Common for CSE, IT, CSC, CSD & AID)

Date: 16.08.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

**PART-A**

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

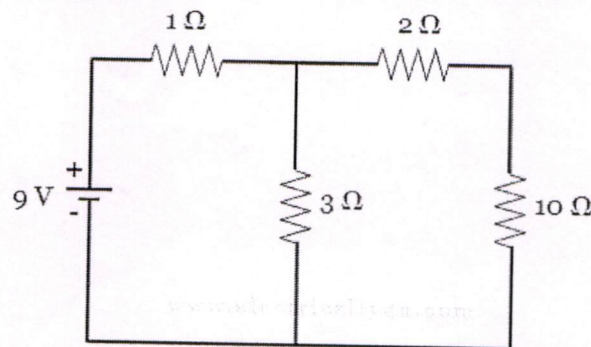
- |  |     |
|--|-----|
| 1. Define KVL.   | 2 M |
| 2. Two resistors of 5 and 10 ohms are connected in parallel. Find the equivalent resistance.       | 2 M |
| 3. The phase difference between voltage and current in a pure capacitor is _____                   | 2 M |
| 4. Define peak factor.   | 2 M |
| 5. Name the different types of DC motors.  | 2 M |
| 6. What is the DC generator principle?   | 2 M |
| 7. Define transformation ratio.  | 2 M |
| 8. What is the purpose of using breather in transformer?   | 2 M |
| 9. Draw the torque slip characteristics of 3-phase induction motor.                                | 2 M |
| 10. A 4 pole 50 Hz induction motor is running at 1400 rpm. What is the synchronous speed and slip? | 2 M |

**PART-B**

Answer the following. Each question carries TEN Marks.

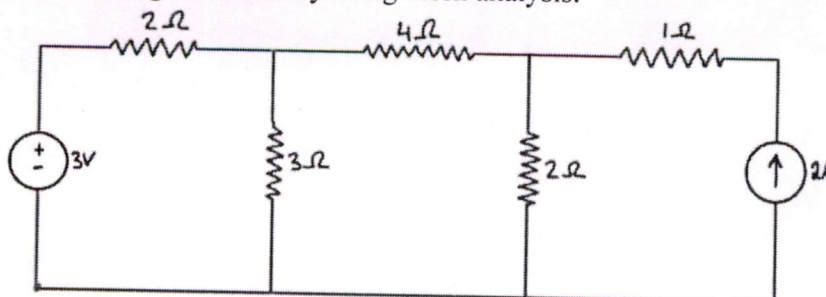
5x10=50M

- 11.A). Solve the given circuit to find the current through 10 Ω using Thevenin's Theorem. 10M



**OR**

11. B). Find the current through resistors by using mesh analysis. 10M



(P.T.O.)

12. A). Derive the relation between phase and line quantities in case of three phase delta connected system. 10M

**OR**

12. B). Derive the RMS and average value of alternating quantity. 10M

13. A). Explain the construction of DC machine. 10M

**OR**

13. B). Derive the EMF equation of DC generator. 10M

14. A). A 400 kVA transformer has a primary winding resistance of 0.5 ohm and a secondary winding resistance of 0.001 ohm. The iron loss is 2.5 Kw and the primary and secondary voltages are 5 kV and 320 V respectively. If the power factor of the load is 0.85, determine the efficiency of the transformer (i) on full load and (ii) on half load. 10M

**OR**

14. B). Explain the operation and principle of single phase transformer. 10M

15. A). Explain the construction of three phase induction motor. 10M

**OR**

15. B). Explain capacitor start and run induction motor and shaded pole induction motor. 10M

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