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R18

Course Code: A30405



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech IV Semester Supplementary Examinations Feb/March-2023

Course Name: SIGNALS & SYSTEMS

(Common for EEE & ECE)

Date: 21.02.2023 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

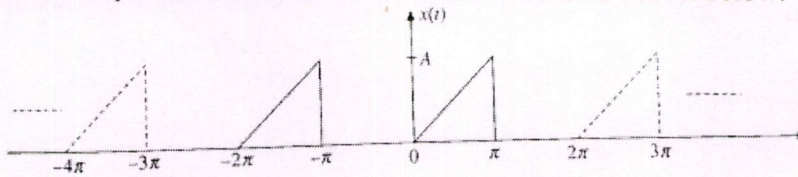
1. Define any 2 Properties of Fourier Series 2 M
2. Explain the condition of Orthogonality for signals approximation. 2 M
3. With the help of neat diagram discuss different types of sampling. 2 M
4. Illustrate the concept of under sampling and oversampling with an example. 2 M
5. Explain LPF and HPF Filter characteristics of the linear system. 2 M
6. Find Transfer function of $6 \frac{d^2y(t)}{dt^2} + 13 \frac{dy(t)}{dt} + 4y(t) = 4 \frac{dx(t)}{dt}$. 2 M
7. State and prove Parseval's Theorem. 2 M
8. Discuss about Energy Spectral Density and Autocorrelation. 2 M
9. Find the Laplace Transform of the following signal (i) $x(t) = e^{-2t} u(t) + e^{-3t} u(t)$ and (ii) $x(t) = e^{2t} u(t) + e^{-3t} u(-t)$ 2 M
10. Differences between Laplace Transform and Z-Transform. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Obtain Exponential Fourier Series of the waveform shown below. 10M



OR

11. B). A rectangular function is defined as 10M

$$X(t) = \begin{cases} A & 0 \leq t \leq \pi/2 \\ -A & \pi/2 \leq t \leq 3\pi/2 \\ A & 3\pi/2 \leq t \leq 2\pi \end{cases}$$

Approximate the above function by A Cos(t) between the interval (0, 2π) such that mean square error is minimum?

(P.T.O..)

12. A). i) Determine the signal $x(t)$ for the given Fourier Transform
 $X(e^{j\omega}) = 1 + 2 e^{-j\omega} + 2 e^{-2j\omega} + 3 e^{-3j\omega}$ 5M
 ii) State the Time Shifting property theorem of Fourier Transform. 5M
- OR**
12. B). i) State Sampling Theorem and Discuss about the types of sampling? 5M
 ii) Find the sampling rate of the following input signals 5M
 (a) $x(n) = \cos(0.125\pi n)$, (b) $x(n) = \sin(\pi + 0.2n)$
13. A). i) Explain in detail the design of Ideal High Pass Filter Characteristics. 3M
 ii) Explain in detail the distortion less transmission through a system. 7M
- OR**
13. B). Determine free response of the system described by the differential equation 10M
 i) $y(n) - 5/6 y(n-1) + 1/6 y(n-2) = x(n)$ for $y(-1) = 1$ and $y(-2) = 0$
 ii) Determine forced response for $x(n) = (1/4)^n u(n)$
14. A). i) A Signal $x(t) = \sin(\omega_0 t)$ find its $R(\tau)$ and Energy Density Spectral. 5M
 ii) Write 3 Properties of Correlation function. 5M
- OR**
14. B). i) Define Cross Correlation with an example. 5M
 ii) State and prove any 3 Properties of cross correlation. 5M
15. A). i) State and prove any 3 Properties of Laplace Transform. 5M
 ii) Find Z Transform of $X(Z) = (1+3Z^{-1}) / (1+6Z)$. 5M
- OR**
15. B). i) Let $X(Z) = Z / (Z^2 + 3Z + 2)$ Sketch the ROC if the sequence $x(n)$ is a two sided sequence. 5M
 ii) Using Convolution Theorem of Laplace Transform find $y(t) = [x_1(t) * x_2(t)]$; for the signals defined below 5M
 (a) $x_1(t) = \sin 3t u(t)$ and $x_2(t) = \cos 2t u(t)$
 (b) $x_1(t) = t u(t)$ and $x_2(t) = t u(-t)$

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Course Code: A30205



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech IV Semester Supplementary Examinations Feb/March-2023

Course Name: **ELECTRICAL MACHINES-II**

(Electrical & Electronics Engineering)

Date: 23.02.2023 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. Differentiate full pitch coil and short pitch coil. | 2 M |
| 2. What does the formula for Distribution factor? | 2 M |
| 3. What is meant by synchronous speed? | 2 M |
| 4. State the Faradays laws. | 2 M |
| 5. Define slip of an Induction motor. | 2 M |
| 6. What are the effects of increasing rotor Resistance on starting current and starting torque? | 2 M |
| 7. Name the two different theories with which principle of single phase Induction motors are explained. | 2 M |
| 8. In what respect does a single phase Induction motor differ from a three phase Induction motor? | 2 M |
| 9. What is the necessity of parallel operation of Alternators? | 2 M |
| 10. What are V and Inverted V curves of synchronous motor? | 2 M |

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- | | |
|---|-----|
| 11.A). Find i) Pitch factor, ii) Distribution factor and iii) Winding factor for a three phase, 6 pole AC machine with 72 slots. The coil span is 1 to 10 slots? | 10M |
| OR | |
| 11. B). Explain why Distributed windings are preferred over concentrated windings in making stator windings of synchronous machines? | 10M |
| 12. A). Show that when two identical coils displaced by 90° are connected across two phase supply, A uniformly rotating field of constant amplitude rotating at synchronous speed is produced? | 10M |
| OR | |
| 12. B). i) What is rotating magnetic field? | 5M |
| ii) How can the direction of stator revolving field be reversed? | 5M |
| 13. A). With the aid of necessary sketches, describe the features in the construction of Slip ring type Induction motor? | 10M |
| OR | |
| 13. B). The power input to a 415V, 50 HZ, 6 pole, three phase Induction motor running at 960 rpm is 50 KW. The stator losses are 1.25 KW. Calculate the i) Percentage slip ii) Rotor copper loss iii) Shaft output and iv) the efficiency. Assume mechanical losses to be 0.4 KW? | 10M |

(P.T.O..)

14. A). Develop an equivalent circuit for single phase Induction motor and explain how the performance can be predetermined? 10M

OR

14. B). What is split phase Induction motor? Why is the starting torque of such motor relatively small? 10M

15. A). Discuss briefly the constructional features of cylindrical rotor alternator. 10M

OR

15. B). Derive the EMF equation a synchronous machine. 10M

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Course Code: A30204



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech IV Semester Supplementary Examinations Feb/March-2023

Course Name: POWER SYSTEMS-I

(Electrical & Electronics Engineering)

Date: 25.02.2023 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 functions of an economizer in Thermal Power Plant. 2 M
2. Show the chain reaction in Nuclear Power Plant. 2 M
3. List out the method to harnessing the geo thermal energy. 2 M
4. Tell about Anaerobic digestion in Bio-gas plant. 2 M
5. Show the single line diagram of radial distribution system. 2 M
6. Label the design features of distribution systems. 2 M
7. Show the single line diagram of Gas insulated substation. 2 M
8. Interpret the methods of improving power factor. 2 M
9. Outline about the three-part tariff. 2 M
10. Summarize the diversity factor and plant capacity factor. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Illustrate the functions of Cooling tower and condenser with respect to Thermal power station. 10M

OR

11. B). Demonstrate the working of a Nuclear Power Station with a neat layout diagram. 10M

12. A). What is renewable energy and explain about the potential of new and renewable energy source to generate the electrical energy? 10M

OR

12. B). Explain the procedure to extract the heat energy from the hot rocks in two methods with neat diagrams. 10M

13. A). Compare in detail the radial and ring main distribution systems. Discuss the characteristics of each system. Also explain the design features of each system. 10M

OR

13. B). A two-wire DC distributor AB is 300m long. The end A is fed at 205V and end B at 200V. The distributor is uniformly loaded at 0.15A/m length and concentrated loads of 50A, 60A and 40A at point distance 75, 175, 225 meters respectively from the end A. The resistance of each conductor is 0.15 ohm/Km. Calculate i) the point of minimum potential ii) the currents fed at ends A&B. 10M

(P.T.O..)

14. A). Analyze the single bus bar arrangement with its suitable neat diagram and list out its merits and demerits. 10M

OR

14. B). Examine the voltage control in power system using series capacitors, tap changing transformers and booster transformers. 10M

15. A). Discuss the objectives and requirements of tariff methods. Calculate annual bill of a consumer whose maximum demand is 100KW, p.f=0.8 lagging and load factor=60%. The tariff used is Rs.75/KVA of maximum demand plus 15 paise per KWh consumed. 10M

OR

15. B). Simplify the following with short note: 10M
i) Two-part tariff
ii) Power factor tariff

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Course Code: A30206



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech IV Semester Supplementary Examinations Feb/March-2023

Course Name: NETWORK THEORY-II

(Electrical & Electronics Engineering)

Date: 28.02.2023 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. Give the way how do you convert to unbalanced star to unbalanced delta system. 2 M
2. Mention the importance of three phase systems are preferred over single phase systems for the transmission of power? 2 M
3. Interpret the voltage drop across the capacitor does not change instantaneously. 2 M
4. Identify the behavior of inductor and capacitor when they are in steady state. 2 M
5. State the properties of driving point function. 2 M
6. List the necessary conditions of transfer function. 2 M
7. Illustrate the condition for symmetry and reciprocity with reference to y and h parameters. 2 M
8. A two-port network is described by $V_1 = I_1 + 2V_2$, $I_2 = -2I_1 + 0.4V_2$. Write the impedance matrix. 2 M
9. List out various types of symmetry. 2 M
10. Write the properties of Fourier Transform. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Draw phasor diagram of currents for a balanced delta-connected supply system and establish relation between line currents and phase currents. 10M

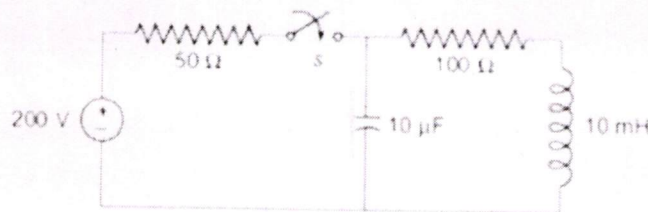
OR

11. B). A balanced 3 - phase, 3-wire 50 Hz, 100 V supply is given to a load consisting of three impedances $(1+j1)$, $(1+j2)$, $(3+j4)$ ohms connected in star. Compute the line and phase voltages and also currents. 10M

12. A). Derive the expression for transient response in series R-L-C circuit for DC excitation. Obtain the solution using Laplace transforms. 10M

OR

12. B). When the switch is closed at $t = 0$, find the transient currents across inductor for the network shown in below Figure. Assume that initial current across the inductor is zero. 10M



(P.T.O..)

13. A). State and explain the properties of positive real function and transfer function. 10M

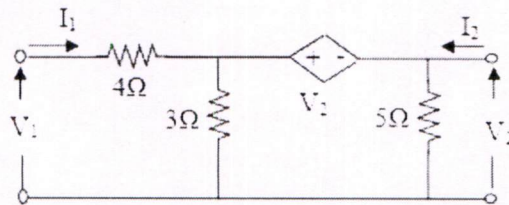
OR

13. B). Test whether $F(S)=(S+8)(S+2)/(S+4)(S+6)$ is positive real function. Explain the concept of transform impedance and transform circuits. 10M

14. A). Express hybrid parameters as a function of transmission parameters. 10M

OR

14. B). Determine the Z and Y-parameters of the network 10M

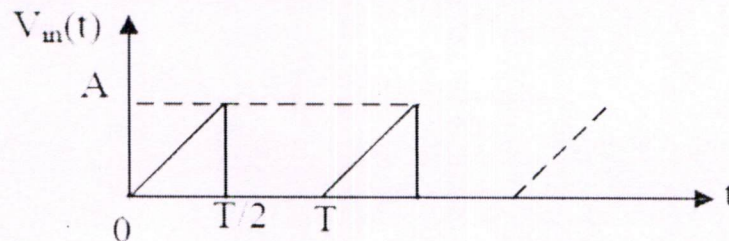


15. A). Compute the Fourier transform of the following functions: 10M

- i) $\delta(t-t_0)$
- ii) $\cos\omega t$
- iii) $e^{j\omega t}$

OR

15. B). Obtain the trigonometric Fourier series for the waveform shown in below figure 10M



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Course Code: A30554



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech IV Semester Supplementary Examinations Feb/March-2023

Course Name: JAVA PROGRAMMING

(Common for EEE & ECE)

Date: 04.03.2023 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. Size of the int and double variable in Java. 2 M
2. Where we use "this" keyword in Java Programming? 2 M
3. How to make a possibility of Multiple Inheritance in Java? 2 M
4. How to call Inner Class Method with example? 2 M
5. Wrapper classes can convert into data type? if yes, give the example. 2 M
6. Where "throws" keyword used in Java? 2 M
7. What is the purpose of Thread in Java? 2 M
8. List the two ways of implementing thread in Java. 2 M
9. Which of the class is used to read characters and strings in Java from console? 2 M
10. What is System. error in java? 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Build Program for Constructor over loading and Method Over loading in single file(program). 10M
- OR**
11. B). What is Type Conversion and Casting? Brief explain with example. 10M
12. A). Command line argument, values can be used as Parameters/Variables? Justify with example? 10M
- OR**
12. B). What is method Overriding? Explain the concepts of method overriding and over loading with example. 10M
13. A). Different Methods in String Class, explain with suitable example. 10M
- OR**
13. B). What is Exception. How to create User defined Exception with example? 10M
14. A). Explain Lifecycle of the Thread. 10M
- OR**
14. B). What is Java Thread Priorities with example? 10M
15. A). Write program for to read and write a file using Stream classes. 10M
- OR**
15. B). Discuss Java Random Access File in JavaIO with sample example. 10M

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Course Code: A30403



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech IV Semester Supplementary Examinations Feb/March-2023

Course Name: SWITCHING THEORY & LOGIC DESIGN

(Electrical & Electronics Engineering)

Date: 08.03.2023 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. Perform the following conversions $(476.64)_{10} = ()_2 = ()_8$. 2 M
2. Find the dual of the function: $A'B(C+D)+B'C'D+AB'C$. 2 M
3. Define Multiplexer. Explain in brief about 2:1 Mux. 2 M
4. Elucidate the procedure to construct the 3 variable K-map with an example. 2 M
5. Derive the characteristic equations of D and T flip-flop. 2 M
6. List the features of sequential circuits. 2 M
7. Define state diagram. 2 M
8. Write the differences between combinational and sequential circuits. 2 M
9. What are finite state machines? 2 M
10. List the limitations of finite state machines 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Express the following numbers in decimal: 10M
- i) $(26.24)_8$
 - ii) $(16.5)_{16}$
 - iii) $(10001110)_2$

OR

11. B). Simplify and realize the following Boolean expression using logic gates. 10M
- i) $Y=AB+A'C+BC$
 - ii) $Y=(A+B'+C')(A+B'+C)$

12. A). Design a digital system to compare two binary numbers of 1 bit by using logic gates. 10M

OR

12. B). Implement the following Boolean functions using PLA. 10M
- i) $F1 = _ (0, 1, 2, 4)$
 - ii) $F2 = _ (0, 5, 6, 7)$

13. A). Construct a JK flip flop using a D flip flop. 10M

OR

13. B). Explain master slave JK flip-flop with neat timing diagram. 10M

(P.T.O..)

14. A). Explain the principle of Universal shift Register (USR). Using the same, design 4-bit, mod-8 twisted ring counter. 10M

OR

14. B). i) Discuss about the approaches of designing synchronous sequential finite state machines. 5M
ii) Design a digital controller for the state table shown below using sequential component as single input data flip flop. 5M

Present state	Next state, Output(z)	
	Input(x)=0	Input(x)=1
A	C,0	B,1
B	D,0	D,0
C	C,1	A,0
D	A,1	A,0

15. A). Draw the state diagram of a Mealy machine that produces a 1 output if there have been four or more consecutive 1 input or two or more consecutive 0 inputs. 10M

OR

15. B). Draw the diagram of Mealy type FSM for serial adder. 10M
