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PRESIDENCY UNIVERSITY BENGALURU

SCHOOL OF ENGINEERING

MAKEUP EXAMINATION - JULY 2024

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| **Semester : 3** | **Date :02/07/2024** |
| **Course Code :EEE219/EEE220** | **Time :9:30 am to 12:30 pm** |
| **Course Name :Network Theory** | **Max Marks :100** |
| **Program : B.Tech** | **Weightage :50%** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3 parts.*
3. *Scientific and non-programmable calculator are permitted.*
4. *Do not write any information on the question paper other than Roll Number.*

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| **PART A** | | | |
| **ANSWER ANY 5 QUESTIONS 5Q X 2M=10M** | | | |
| 1 | Mesh and Nodal analysis are two basic important techniques which are useful to find a solution in a network. Differentiate between mesh and nodal analysis. | (CO1) | [Knowledge] |
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| 2 | State why three-phase motors are self-starting whereas single-phase motors are not self-starting. | (CO1) | [Knowledge] |
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| 3 | All Commercial energy throughout the world is generated, transmitted and distributed in the form of three phase energy. Why 3-phase systems are more popular? | (CO1) | [Knowledge] |
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| 4 | State the condition of reciprocity for two port network system. | (CO1) | [Knowledge] |
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| 5 | Current through a capacitor is proportional to the rate of change of voltage. It is impossible to change the voltage across a capacitor by a finite amount in zero time. If there is no voltage across the capacitor at t = 0– , then at t = 0+, State what would be voltage across the capacitor would be? | (CO2) | [Knowledge] |
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| 6 | This theorem deals with transfer of maximum power from a source to load. Name the theorem and also, provide the statement of the theorem. | (CO2) | [Knowledge] |
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| 7 | State Thevenin's Theorem and write two advantages of Thevenin's Theorem. | (CO2) | [Knowledge] |
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| **PART B** | | | |
| **ANSWER ANY 5 QUESTIONS 5Q X 10M=50M** | | | |
| 8 | The switch in the network shown in Figure  b. is closed at t = 0. Determine the voltage across the capacitor, Vc(t) for t > 0 using Laplace transforms.  IMG_256  . | (CO2) | [Understand] |
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| 9 | In the Figure a. given below, the switch is closed. Assuming all initial conditions as zero, Assuming all initial conditions as zero, find the value for i, IMG_256, at t = 0+  IMG_257  In the Figure a. given below, the switch is closed. Assuming all initial conditions as zero, Assuming all initial conditions as zero, find the value for i, IMG_256, at t = 0+  IMG_257 | (CO2) | [Understand] |
|  | | | |
| 10 | A balanced delta connected load impedance (8-j8) ohm/phase is connected to a three phase, 230 V, 50 Hz supply. Calculate (i) line current of the delta connected load, (ii) power factor of the delta connected load(iii) reactive power of the delta connected load. | (CO3) | [Understand] |
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| 11 | Find out the current through 10 ohm resistance Thevenin’s Theorem. IMG_256 | (CO2) | [Understand] |
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| 12 | Using mesh method, find the current through 2Ω resistance for the network shown in Figure. Also find out the voltage drop across the same. IMG_256 | (CO3) | [Understand] |
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| 13 | Find the current through 3-ohm resistance using thevnin’s theorem. IMG_256 | (CO2) | [Understand] |
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| 14 | A two-port network is an electrical network with two separate ports for input and output. They are useful in communications, control systems, power systems, and electronics. For example, hybrid parameters are used in electronics to model transistors and to facilitate cascaded design. Second, knowing the parameters of a two-port network enables us to treat it as a “black box” when embedded within a larger network. Determine the Z parameters of the network shown in figure. | (CO3) | [Understand] |
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| **PART C** | | | |
| **ANSWER ANY 2 QUESTIONS 2Q X 20M=40M** | | | |
| 15 | As per the circuit given, identify the unknown parameters that could be obtained from the given data and compute the same. Assume that Z1= 1Ω, Z2=4Ω, Z3=6Ω.As per the circuit given, identify the unknown parameters that could be obtained from the given data and compute the same. Assume that Z1= 1Ω, Z2=4Ω, Z3=6Ω.IMG_256 | (CO4) | [Understand] |
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| 16 | In a delta connected network, dissimilar terminals of the three windings are joined together, i.e., the ‘finish’ terminal of one winding is connected to the ‘start’ terminal of the other winding, and so on. For a balanced system, the sum of the three phase voltages round the closed mesh is zero. The three emfs are equal in magnitude but differ in phase from one another by 120°. A balanced delta-connected load of impedance (8 – j6) ohm per phase is connected to a three-phase, 230-V, 50-Hz supply. Calculate (i) line current , (ii) Power Factor and (iii) Reactive Power. | (CO3) | [Understand] |
|  | | | |
| 17 | In mesh analysis, the currents in different meshes are assigned continuous paths so that they do not split at a junction into branch currents. If a network has a large number of voltage sources, it is useful to use mesh analysis. Find voltage at nodes 1 and 2. IMG_256 | (CO2) | [Understand] |