**18EI304**

**Hall Ticket Number:**

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| **II/IV B.Tech (Supplementary) DEGREE EXAMINATION** | | | |
| **February, 2021** | **Electronics Instrumentation Engineering** | | |
| **Third Semester** | **Network Theory** | | |
| **Time:** Three Hours | | **Maximum :** 50 Marks | |
| *Answer ALL Questions from PART-A.* | | | (1X10 = 10 Marks) |
| *Answer* ***ANY FOUR*** *questions from PART-B.* | | | (4X10=40 Marks) |
| **Part - A** | | | |

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| 1 | Answer all questions | | (1X10=10 Marks) | |
|  | a) | How can you convert the given voltage source circuit into current source circuit | |  |
|  | b) | Distinguish between dependent source and independent source | |  |
|  | c) | State KCL and KVL | |  |
|  | d) | What is a power triangle | |  |
|  | e) | State the Norton’s theorem | |  |
|  | f) | Define resonant frequency of a RLC series circuit | |  |
|  | g) | What do you mean by transient response and steady state response | |  |
|  | h) | What is the Laplace transform of the unit ramp function | |  |
|  | i) | Give any two properties of the Laplace Transform | |  |
|  | j) | Define Z parameters | |  |
| **PART - B** | | | | |
| 2 | a) | Determine the current delivered by the source and if V=30v in the circuit shown in fig.  C:\Users\Niranjan\Desktop\SET2 NT\New Doc 2019-10-05 16.46.54_1.jpg | | 5M |
|  | b) | Discuss how a star connected network can be transformed into a delta connected circuit and vice versa | | 5M |
|  | | | | |
| 3 | a) | For the circuit shown in fig. find the voltage across the 4 ohm resistor  C:\Users\Niranjan\Desktop\SET2 NT\New Doc 2019-10-05 16.46.54_3.jpg | | 5M |
|  | b) | For the circuit shown in fig. find the mesh currents and also find voltage across the 6 ohm  C:\Users\Niranjan\Desktop\SET2 NT\New Doc 2019-10-05 16.46.54_4.jpg | | 5M |
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| 4 | a) | Find the form factor and crest factor of the given wave shown in fig.  C:\Users\Niranjan\Desktop\SET 3 NT\New Doc 2019-10-05 17.06.47_4.jpg | | 5M |
|  |  |  | |  |
|  | b) | Define average power and reactive power. For the circuit shown in fig find the true power , reactive power and apparent power in each branch.  C:\Users\Niranjan\Desktop\SET2 NT\New Doc 2019-10-05 16.46.54_6.jpg | | 5M |
|  | | | | |
| 5 | a) | State and prove Super position theorem with one example | | 5M |
|  | b) | For the circuit shown in fig. Determine the value of the RL that will receive max power. Also determine maximum power delivered to the load  C:\Users\Niranjan\Desktop\SET1 NT\New Doc 2019-10-05 16.59.09_6.jpg | | 5M |
|  | | | | |
| 6 | a) | For a RLC series resonance circuit derive the expressions for f0 , BW and Q factor | | 5M |
|  | b) | For the circuit shown in fig. an inductance of 0.1H having a Q of 5 is parallel with a capacitor. Determine the value of capacitance and coil resistance at resonant frequency of 50 rad/sec.  C:\Users\Niranjan\Desktop\SET2 NT\New Doc 2019-10-05 16.46.54_8.jpg | | 5M |
|  | | | | |
| 7 | a) | Analyse DC response of the RL and RC circuit | | 5M |
|  | b) | In the circuit shown in fig. the switch is moved from position 1 to position 2 at t=0. The switch is in position 1 for long time, Determine the current expression i(t).  C:\Users\Niranjan\Desktop\SET2 NT\New Doc 2019-10-05 16.46.54_9.jpg | | 5M |
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| 8 | a) | State and prove initial and final value theorems | | 5M |
|  | b) | Find the Laplace Transform of the following.   1. f ( t ) = ( t + 2 )2 et | | 5M |
|  | | | | |
| 9 | a) | Determine the current expression i(t) for t > 0 , if the initial current i(0) =1 fot the circuit shown in fig using Laplace transform  C:\Users\Niranjan\Desktop\SET2 NT\New Doc 2019-10-05 16.46.54_10.jpg | | 5M |
|  | b) | For given network determine the Z and Y parameters  C:\Users\Niranjan\Desktop\SET2 NT\New Doc 2019-10-05 16.46.54_11.jpg | | 5M |

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