|  |  |  |
| --- | --- | --- |
| **Benha University**  **Faculty of Engineering at Shoubra**  **Electrical Engineering Department**  **1st Year Communications** | Benha Logo | **Final Term Exam**  **Date: Sunday 24/1/2016**  **Subject: Electrical Circuits 1**  **Duration: 3 hours** |
| * **Answer all the following questions** * **Illustrate your answers with sketches when necessary** | | * **No. of questions : 2 in Part II** * **Total Mark: 45 Marks for Part II** |

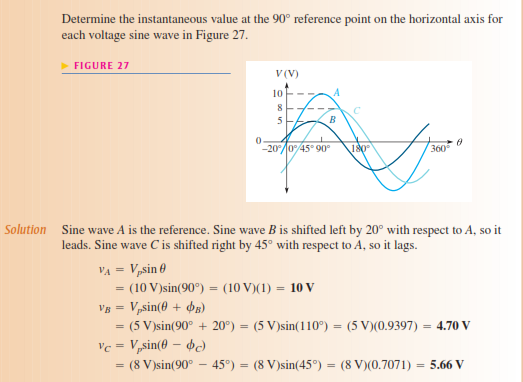
**Part II**

**[45 Marks]**

**Answer the following questions:**

**Question (4) [23 Mark]:**

1. A sine wave has a frequency of 100 kHz. How many cycles does it complete in 10 ms? [3 Marks]
2. A series RL circuit has a resistance of 20kΩ and a coil of 10 mH at a frequency of 10 kHz. Determine the total impedance and phase angle. [4 Marks]
3. Determine the instantaneous value at the 90o reference point on the horizontal axis for each wave in the following figure [6 Marks]

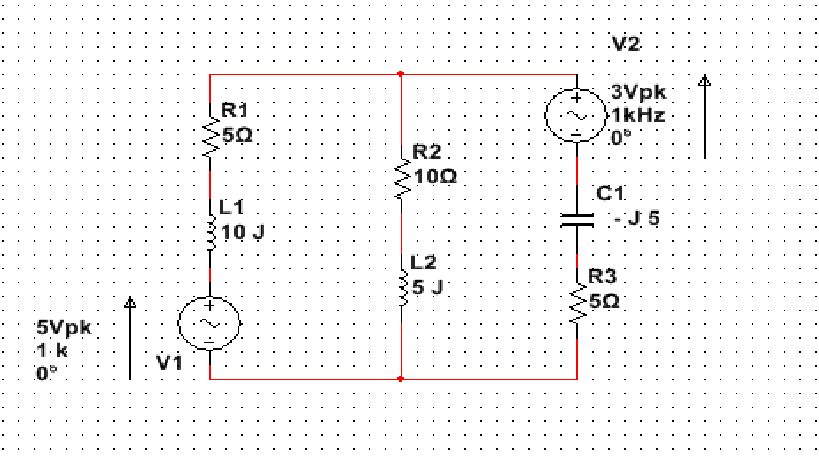


1. Compare between active and passive filters. [4 Marks]
2. Compare between low pass, high pass, band pass and band stop filters. [6 Marks]

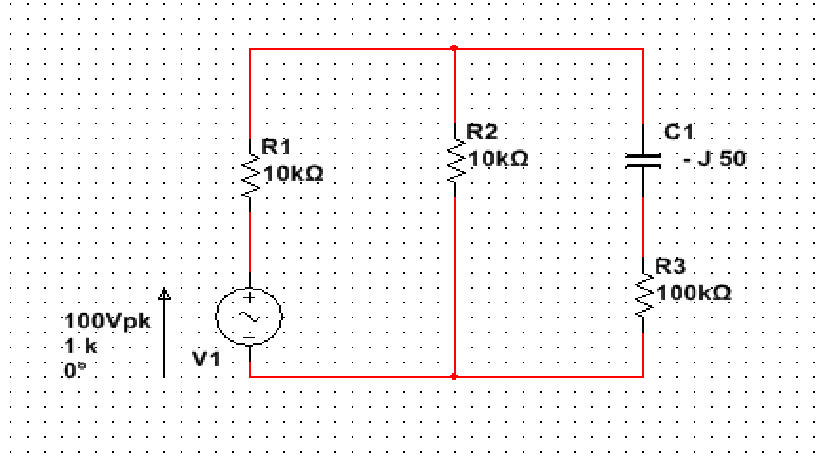
**Question (5) [22 Mark]:**

1. Use transformation theorems (i.e. Norton or Thévenin) (**Note:** you must Mention to the applied theory in your answer) to calculate: [11 Mark]

* The current through R2 and L2.
* The voltage drop across R2.



1. Apply circuit theory techniques (i.e**. Mesh or Nodal**) to solve the following problem



Assume that the above circuit is a part from television receiver circuit and the branch (C1 and R3) is a critical part and we need to know:

* The rated power for R3 to be used.
* The rated voltage for C1 to be used, to ensure normal operation for long time without the receiver gets damaged.

***Good luck***

***Dr .Michael Nasief***