

Code: EC1T6

**I B.Tech - I Semester – Regular Examinations – November 2015**

**INTRODUCTION TO ELECTRICAL CIRCUITS  
(ELECTRONICS & COMMUNICATION ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

**PART – A**

Answer *all* the questions. All questions carry equal marks

11 x 2 = 22 M

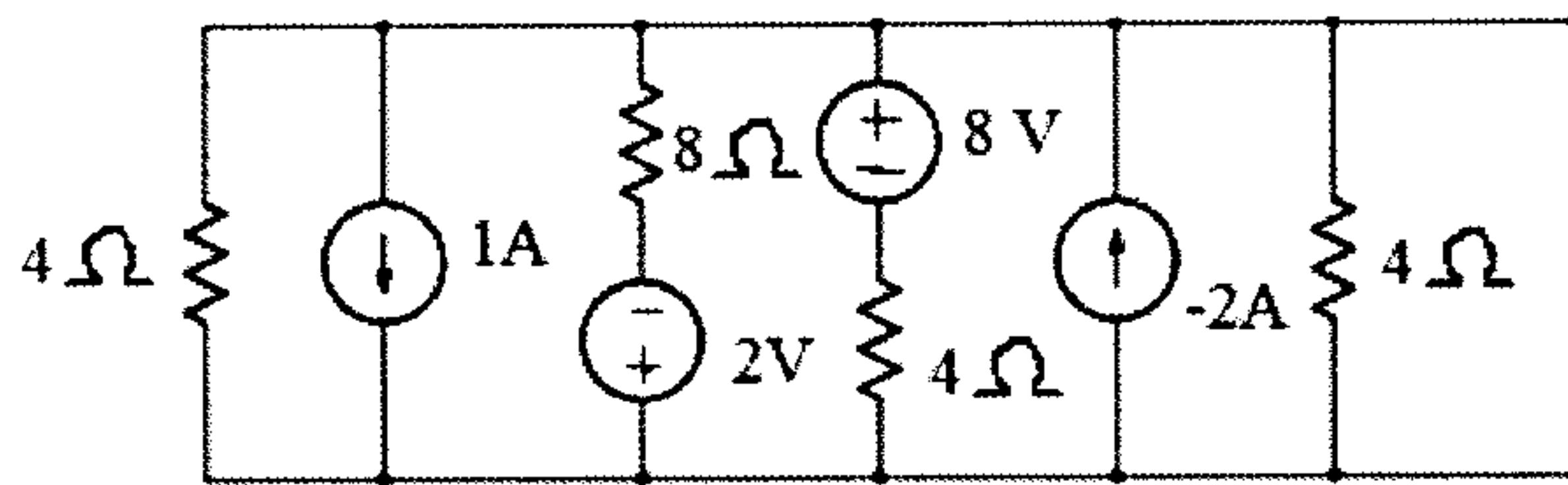
1. a) Distinguish between Active & Passive Elements.
- b) What is a dependent source, classify them?
- c) Explain Dot Convention in brief.
- d) Write the comparisons between Electric and Magnetic circuits.
- e) Define form factor & peak factor.
- f) Find the Average value of a standard sinusoidal wave.
- g) Draw the impedance Triangle with its relations.
- h) Draw the phasor diagram of series RLC a.c circuit with all possible conditions.
- i) Derive the resonating frequency of series RLC circuit.
- j) If Q-factor of a circuit is 10 with a resonating frequency of 2 rad/sec. Find its Bandwidth of the circuit. Also selectivity.
- h) Define Power and Explain its relation with Energy.

## PART – B

Answer any **THREE** questions. All questions carry equal marks. 3 x 16 = 48 M

2. a) Explain Star to delta and delta to star transformation techniques with necessary derivations. 8 M

b) Find the current flowing through 8 ohms resistance and also voltage across it. 8 M

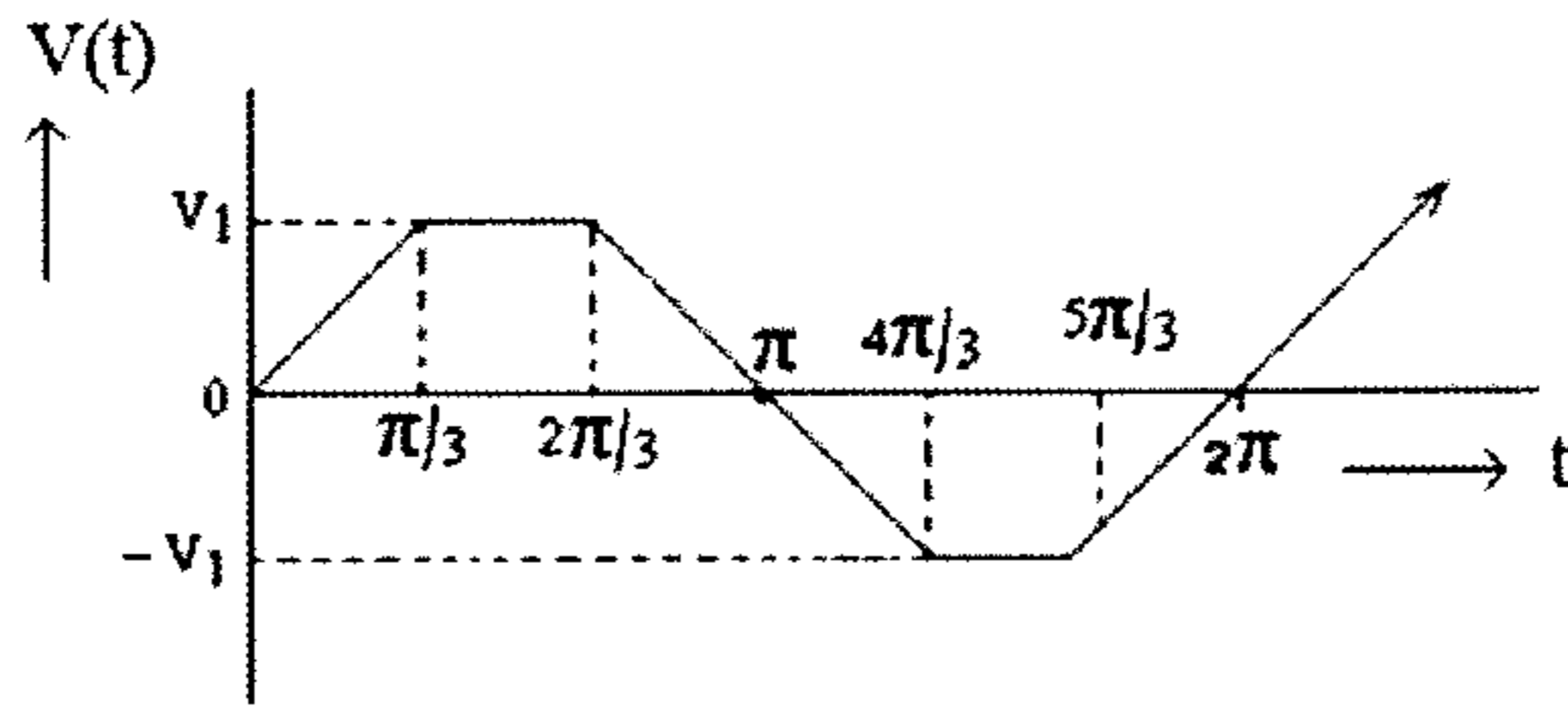


3. a) Define 8 M

- |                   |                             |
|-------------------|-----------------------------|
| i) Reluctance     | ii) Magnetic Flux Density   |
| iii) Permeability | iv) Magnetic Flux Intensity |

b) Define self and mutual inductance. Derive the expression for coefficient of coupling in terms of self & mutual inductances. 8 M

4. a) Find the form factor and peak factor of the waveform shown in Figure. 12 M



b) Explain multiplication & division of complex Quantities with an example. 4 M

5. a) Find the Impedance of

- |                              |                            |
|------------------------------|----------------------------|
| i) Pure Resistive circuit    | ii) Pure Inductive Circuit |
| iii) Pure Capacitive circuit | iv) Series RL circuit      |
| v) Series RC circuit.        |                            |

Also draw its respective phasor diagrams. 10 M

b) Find the Expression for current in a parallel RLC circuit. 6 M

6. a) Derive the expression for resonant frequency of Parallel RLC (Ideal) Circuit also Current at Resonance. 8 M

b) Find 8 M

- |   |                            |
|---|----------------------------|
| i) Resonant frequency   | ii) Half power frequencies |
| iii) Bandwidth  |                            |
| iv) Q-factor of the series RLC circuit with $R=2\ \Omega$ ,<br>$L=2\text{mH}$ , $C=10\ \mu\text{F}$ |                            |