ID:	Name:

Brac University
Semester: Summer 2023
Course Code: CSE250
Circuits And Electronics
Section: 23
Faculty: PRM

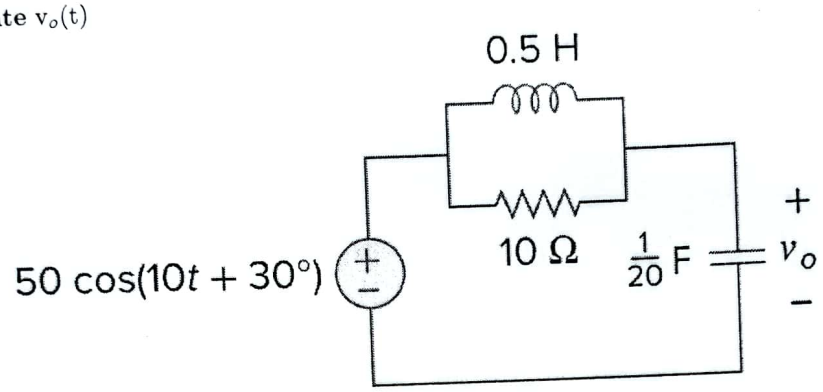
Set **B**

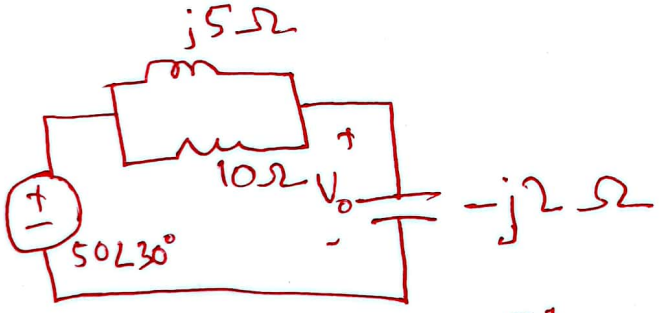
Assessment: *Quiz-5*
Full Marks: 20

- ✓ No washroom breaks. Phones must be turned off. Using/carrying any notes during the exam is not allowed.
- ✓ At the end of the exam, the **answer script** must be returned to the invigilator.
- ✓ **All questions** are compulsory. Marks allotted for each question are mentioned beside each question.
- ✓ Symbols have their usual meanings.

■ Question 1 of 2 *[CO3] [5 marks]*

Calculate $v_o(t)$





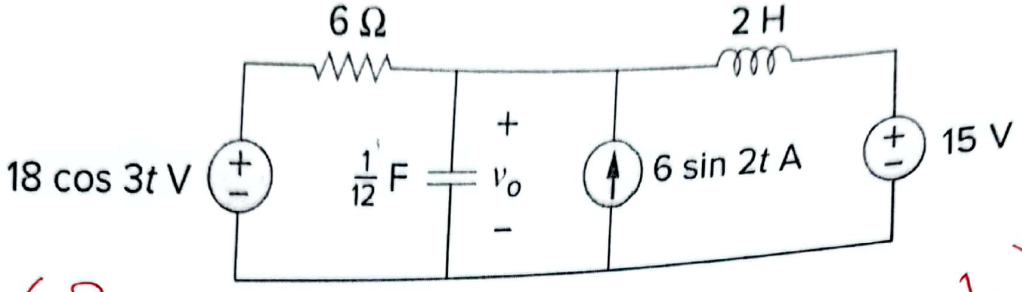
$$Z_p = \left(\frac{1}{j5} + \frac{1}{10}\right)^{-1} = 2 + j4$$

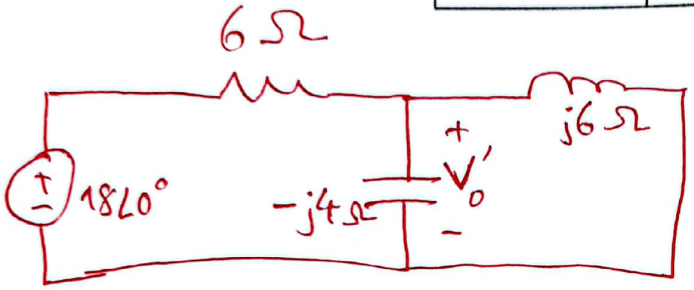
$$\therefore V_o = \frac{-j2}{Z_p - j2} \times 50\angle 30^\circ = 35.36\angle -105^\circ \text{ V}$$

$$\therefore v_o(t) = 35.36\cos(10t - 105^\circ) \text{ V}$$

Question 2 of 2 *[CO3] [15 marks]*

Calculate $v_o(t)$ using Superposition Principle.

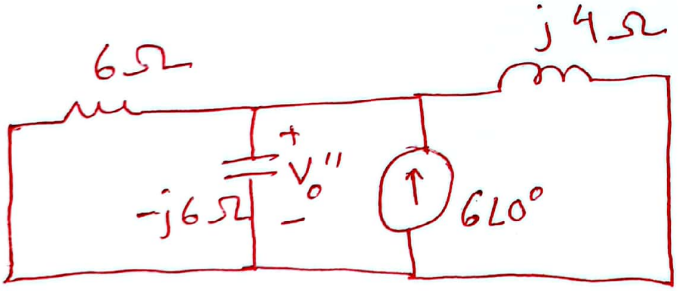




$$Z_p = \left(\frac{1}{j6} + \frac{1}{-j4}\right)^{-1}$$

$$= -j12\ \Omega$$

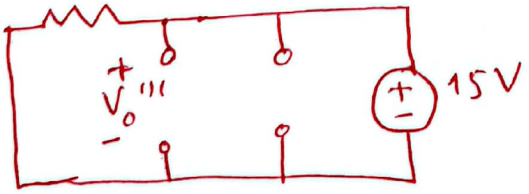
$$\therefore V_o' = \frac{-j12}{6-j12} \times 18\angle 0^\circ = 16.1\angle -26.57^\circ\ V$$



$$Z_p = \left(\frac{1}{6} - \frac{1}{j6} + \frac{1}{j4}\right)^{-1}$$

$$= 4.8 + j2.4$$

$$\therefore V_o'' = 6\angle 0^\circ \times Z_p = 32.2\angle 26.57^\circ\ V$$



$$V_o''' = 15\ V$$

$$\therefore v_o(t) = 16.1\cos(3t - 26.57^\circ) + 32.2\sin(2t + 26.57^\circ) + 15\ V$$