2020

ELECTRONICS — HONOURS

Paper : SEC-A-2

(Circuit Modeling using PSPICE)

Full Marks : 80

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Group - A

1. Answer ***any ten*** questions from the following : 2×10

(a) State any two drawbacks of PSpice software.

(b) Explain ·STEP control statement.

(c) Describe the ·TEMP control statement in brief.

(d) How do you represent a CCVS device in PSpice?

(e) What do you mean by DC sweep in PSpice?

(f) Explain ·TF control statement in brief.

(g) How do you represent a BJT in PSpice?

(h) How do you represent a P-N diode in PSpice?

(i) Explain ·OP control statement.

(j) How do you represent independent DC voltage and independent DC current sources in PSpice?

(k) Write the general form of exponential sources in PSpice.

(l) How do you represent a resistor and a capacitor in PSpice?

Group - B

Answer ***any four*** questions. 5×4

2. Write a PSpice netlist to obtain the output voltage of a series negative clipper using *p-n* diode.

3. How do you represent a JFET and a MOSFET in PSpice?

4. Write down a PSpice netlist to obtain the voltage across load resistance of a half wave rectifier using a capacitor filter.

5. Write a PSpice netlist to obtain the current through a reverse biased Zener diode and to plot the I-V characteristics.

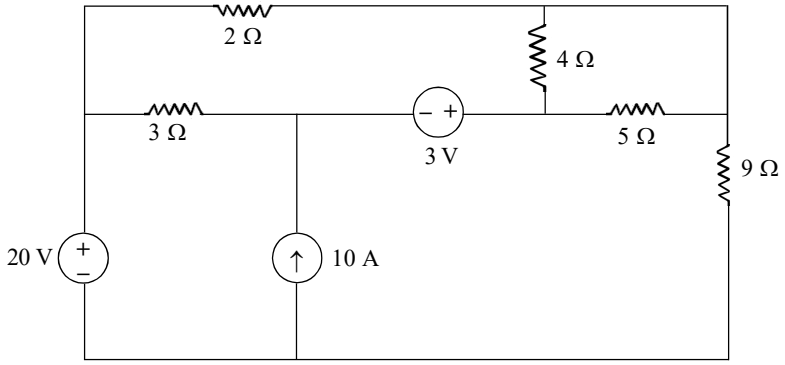
6. Write a PSpice netlist to obtain the output characteristics of a BJT in CE mode.

7. Describe the different file formats used in PSpice.

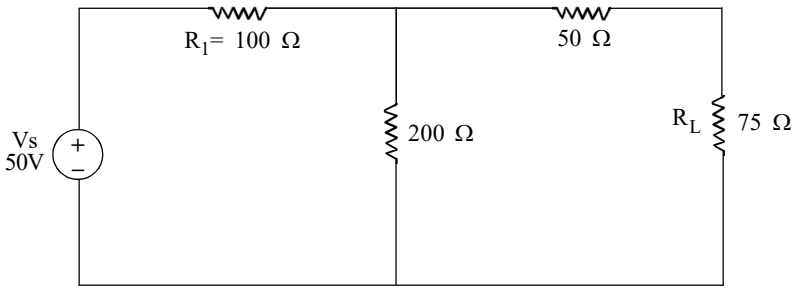
Group - C

Answer ***any four*** questions.

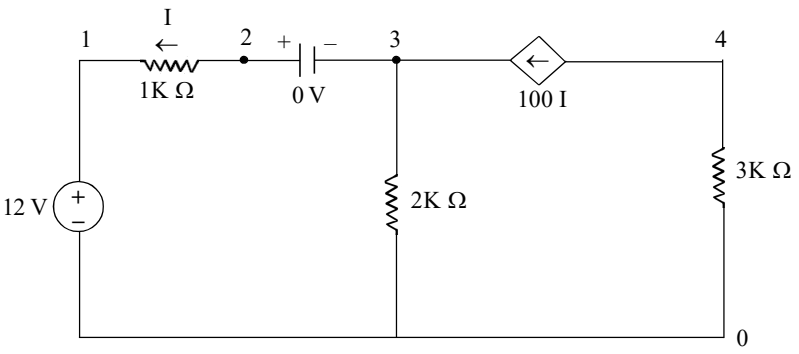
8. Explain the function of ·PROBE and ·PLOT statements. Write the PSpice netlist for the following circuit for DC analysis. 4+6



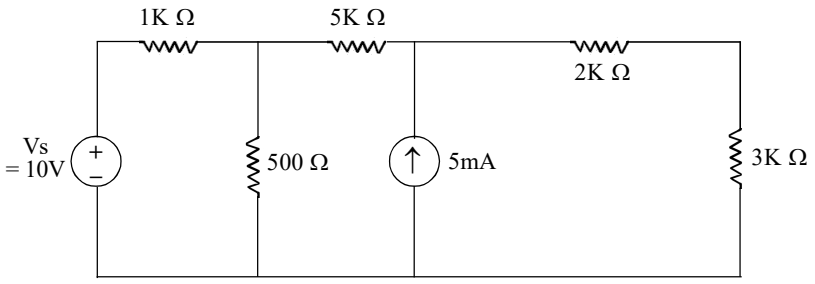
9. Write the PSpice netlist for the following circuit to obtain voltage across R_L and current through R_1. Vary V_S from 0 to 50V in 2V steps. Use ·PRINT command. 7+3



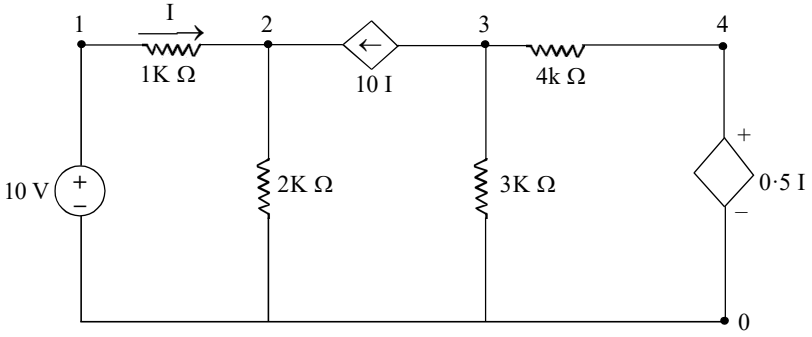
10. What is a VCVS? How do you represent it in PSpice? Write a PSpice netlist for the circuit given bellow to determine the voltages at nodes 2 and 3 and the current – (I) through the 1kΩ resistance. 1+2+7



11. Write the PSpice netlist for the following circuit using ·DC, ·PRINT, ·PROBE and ·PLOT statements. Vary Vs from 0 to 10V in 1V steps. 7+3



12. Describe ·TRAN statement in PSpice. Write the PSpice netlist to perform the DC analysis for the following circuit. Also find current (·I) through the 1kΩ resistor and the voltage at node 4. 3+7



13. How do you represent a sinusoidal AC source in PSpice? Write a PSpice netlist for the following RC circuit and find the magnitude of the current, its real and imaginary components and its phase with respect to the source. 3+7