		Course:	I PUC
JGI	**SRI BHAGAWAN MAHAVEER JAIN COLLEGE** Vishweshwarapuram, Bangalore. **Mock Exam - Feb.2017**	**Subject:**	Electronics
		Max. Marks:	70
		Duration:	3:00

PART-A

I Answer all the questions: **10 x 1 = 10**

1. Who invented vaccum tube triode?
2. What is the internal resistance of an ideal voltage source?
3. What is Pulse Oximeter?
4. Draw the circuit symbol of thermistor.
5. Define quality factor.
6. What is reverse saturation current?
7. In what biasing condition is the photo diode normally operated?
8. Which is the lightly doped region in a transistor?
9. Write the binary equivalent of $ADD_{(16)}$.
10. What is an AND gate?

PART-B

II Answer any five questions: **5 x 2 = 10**

11. Name any two power semiconductor devices.
12. Mention any two properties of charge.
13. State Maximum power transfer theorem.
14. Write a note on trimmers.
15. What is the condition for resonance? Write the expression for resonant frequency.
16. Draw the circuit of series negative clamper and show its input and output waveforms.
17. Derive an expression for α in terms of β.
18. Convert the decimal number $2922_{(10)}$ to hexadecimal number.

PART-C

III Answer any five questions: **5 x 3 = 15**

19. Derive an expression for the effective resistance of resistors connected in parallel.
20. State and explain KVL.
21. Three capacitors 2nF, 4nF and 6nF are connected such that first two are in series and the third is in parallel to them. Find the effective capacitance of the entire combination.

22. Draw the circuit diagram and graph of growth of voltage and write the expression for instantaneous value of voltage across the capacitor in RC circuit.

23. Write a note on diode approximations.

24. Explain the characteristics of a Zener diode.

25. Explain the working of npn transistor.

26. Write the steps involved in PCB designing.

PART-D

IV Answer any three questions: **3 x 5 = 15**

27. Calculate the currents in the following circuit using Kirchhoff's law.
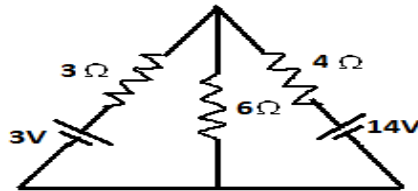
28. A transformer having an output power of 4KW and efficiency of 85% has primary voltage of 22KV and secondary voltage of 220V. Is it a step-up or step-down transformer? Calculate the voltage ratio and number of turns in primary if the secondary has 28 turns. Calculate the current in primary.

29. (a). The time constant of RL circuit is 5ms and if L = 10mH, calculate the value of resistance.

   (b). A series RLC circuit has R = 20Ω, C = 100nF and L = 100mH. Calculate resonant frequency.

30. For the Zener diode voltage regulator circuit with V_s = 20V, R_s = 5KΩ, V_z = 12V and R_L = 5k Ω, calculate

(i) Load voltage   (ii) Voltage across series resistor   (iii) Input current   (iv) Load current
          (v) Zener current

31.(a) Simplify the following Boolean expression and draw the logic diagram for the simplified expression:

$$(\overline{A.B} . A) (\overline{A.B} . B)$$

   (b) Subtract $110111_{(2)}$ - $1110_{(2)}$ using 2's complement.

PART-E

V Answer any four questions: **4 x 5 = 20**

32. State and explain Superposition theorem with an example.

33. (a) Explain the construction of carbon composition potentiometer.
   (b) What is a Relay? Write any one application of Relay.

34. (a) With a labelled diagram explain the working of a moving coil loud speaker.
   (b) Mention one application of microphone.

35. (a) Explain low pass filter with circuit diagram and its frequency response curve.

(b) Define time constant of RC circuit.

36. (a) With a neat circuit diagram and waveform explain the working of a series inductor filter.

(b) Define ripple factor.

37. With a neat circuit diagram explain the working of DTL NAND gate. Write its truth table and logic symbol.