

**I PUC- ELECTRONICS (40)
MODEL QUESTION PAPER**

Time: 3hour 15 min

Max. Marks: 70

PART A

Answer any TEN questions:

1 x 10 = 10

1. What is internet ?
2. Define frequency.
3. When will a load receives maximum power from a source?
4. What is a multimeter?
5. Define resistance.
6. What is a microphone?
7. Define time constant during the discharge of capacitor through a resistance.
8. What are clippers?
9. What happens to the width of depletion layer of a p-n junction when it is reverse biased?
10. Name any one application of LED.
11. Draw the symbol of N-P-N transistor..
12. What does the arrow in the circuit symbol of a transistor indicate?
13. Expand MSB.
14. Write 1's complement of the binary number 1011.
15. What is a part number?

PART B

Answer any FIVE questions:

2 x 5 = 10

16. List any two household electronic equipments/appliances.
17. What will be the resistance of open and short circuit?
18. Mention any two limitations of Ohm's law.
19. Write the symbol of AC ammeter and DC voltmeter.
20. With appropriate diagram, write the expression for three inductors connected in series.
21. What are the factors upon which the time constant of R-L circuit depends?
22. How many diodes are used in a (i) Full wave centre tapped rectifier and (ii) Bridge rectifier.
23. Define transistor (BJT) and Write its current relation.
24. Draw the symbol of AND gate. Write its output logical expression.
25. What are fixed regulators ? Name any one IC fixed regulator.

PART C

Answer any FIVE questions:

3 x 5 = 15

26. Write any three application of electronics in the field of communication.
27. Explain voltage divider rule.

28. Find the electric current, electric power and electric energy at 2 seconds if the supply voltage is 12V and resistance is 10Ω .
29. Mention any three bio-medical electronic devices.
30. With a labelled diagram explain the construction of fixed type wire wound resistor.
31. A 10 KVA (i.e. 10KW) 2200/220 single phase transformer has 60 turns on secondary.

Find:

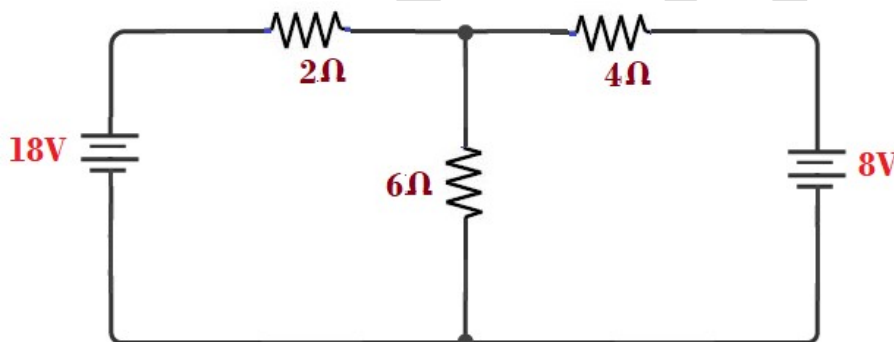
- (i) Number of turns on primary coil
 - (ii) Primary current and
 - (iii) secondary currents
32. What is low pass filter? Draw the circuit diagram and frequency response curve of RC low pass filter.
33. Briefly explain the formation of N-type semiconductor.
34. Define α_{ac} of a transistor. Derive an expression for β in terms of α .
35. Write any three advantages of PCB.

PART D

I. Answer any THREE questions:

5 x 3 = 15

36. Using Kirchhoff's laws find the current through each resistance of the network shown.



37. Complete the following table for the carbon resistor R.

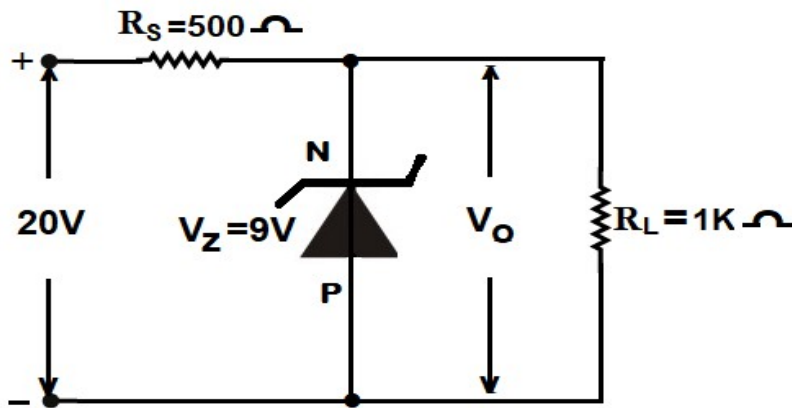
Sl.No.	Band-I	Band-II	Band-III	Band-IV	Value of R
1	Brown	Black	Brown	Gold	
2	Red	Red	Red	Silver	
3					$100K\Omega; \pm 10\%$
4					$1\Omega; \pm 5\%$
5	Blue	Gray	Orange	No colour	

38. An inductor of 10 H in series with a resistor of 20Ω is connected to an 80 V dc supply. Calculate

- (a) Time constant of the circuit
- (b) Find steady state value of current
- (c) Current at time 1 second after the dc supply is connected

39. For the zener diode circuit shown below. Determine:

- (i) Output voltage
- (ii) Voltage drop across series resistor
- (iii) Load current
- (iv) Current through R_S and (v) current through zener diode.



40. Subtract $(10)_{10}$ from $(15)_{10}$ in binary using 2's complement method.

41. In a bridge rectifier, the applied AC voltage is 50 V(Peak) and load resistance is 100 Ω . Calculate V_{dc} , V_{rms} and efficiency.

II. Answer any FOUR questions:

5 x 4 = 20

- 42. Mention any five properties of electrical charge.
- 43. With a labeled diagram explain the construction and working of a moving coil loudspeaker.
- 44. With the help of circuit diagram derive an expression for the equivalent capacitance of three capacitors connected in series.
- 45. With a circuit diagram and phasor diagram derive an expression for impedance in a series R-L-C circuit.
- 46. On the basis of electrical conductivity, classify the solids. Explain their behaviour using energy band phenomenon.
- 47. With a circuit diagram, indicating the input and output waveforms, explain the working of half wave rectifier.
- 48. Define the following terms: (i) Bit (ii) Nibble (iii)Byte (iv) Radix (v) Logic gate
- 49. State and prove De Morgan's theorems.

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Sl. no	Name of the chapter	Knowledge (30%)				Understanding (40%)				Application/skill (30%)				Total
		1	2	3	5	1	2	3	5	1	2	3	5	
1	<i>Introduction to electronics</i>	1	1					1						06
2	<i>Principles of electricity</i>	1	1		1	1	1	1				1	1	22
3	<i>Measuring instruments</i>		1			1		1						06
4	<i>Passive components</i>	1		1	1	1	1		1			1		25
5	<i>AC and DC applied to passive components</i>				1	1	1	1				1		16
6	<i>Semiconductor theory, PN junction diode and its application</i>	1	1	1		1			2	1			2	28
7	<i>Bipolar junction transistor</i>	1	1			1		1						07
8	<i>Digital electronics</i>	1			1	1	1		1				1	19
9	<i>Practical components</i>	1	1					1						06
Total		45				53				37				135