Govt of Karnataka

Dept of Pre University Education

I PUC ELECTRONICS (40)

Blueprint* for Model Question Paper 2022-23 onwards

Sl No.	Name of the Chapter	No. of Hrs	Knowledge and Understanding				Applications and skill				Total
			1	2	3	5	1	2	3	5	
1	Introduction to Electronics	04	√√	√							04
2	Principles of electricity, Network theorems and AC principles	21	√√√	√	√	√			√	√	21
3	Measuring instruments	04	√	√							03
4	Passive electronic components	22	√√√	√	√	√			√	√	21
5	Applications of DC and AC to passive components	14	√√			√		√	√		12
6	Semiconductors, Diodes and Applications to diodes	26	√√	√	√√	√√	√			√	26
7	Bipolar junction transistor	07	√	√	√		√				07
8	Introduction to digital electronics	18	√√√		√	√		√		√	18
9	Practical electronic components, their specifications and PCB	04	√	√							03
	TOTAL	120	80				35				115

*** Only this blueprint has to be followed.**

Parts	Marks per Question	Total Questions given including choices	Questions to be answered
Part A – I (MCQ)	1	15Q×1M = 15	15Q×1M = 15
Part A – II (Fill in the Blanks)	1	5Q×1M = 05	5Q×1M = 05
Part B - III	2	9Q×2M = 18	5Q×2M = 10
Part C - IV	3	9Q×3M = 27	5Q×3M = 15
Part D - V	5	10Q×5M = 50	5Q×5M = 25
		115	70

I PUC- ELECTRONICS (40)

MODEL QUESTION PAPER

Time: 3 Hour 15 min **Max. Marks: 70**

Instructions:

1. **The question paper has four parts A, B, C and D.**
2. **Part - A is compulsory.**
3. **Part - D consists of essay type questions and problems together.**
4. **Circuit diagrams and truth tables must be drawn wherever necessary.**
5. **Solve the problems with relevant formulas.**

PART A

I. Select the correct answer from the choices given: **15 x 1 = 15**

1. Vacuum tube triode is invented by.

   a) Shockley b) Jack Kilby c) J.A. Fleming d) Lee De Forest

2. SI Unit of charge is

   a) Ampere b) Coulomb c) Faraday d) Tesla

3. Let two resistors having resistance value R each are connected in parallel the effective resistance of the combination is

   a) 2R b) 3R c) R/2 d) R/4

4. Sphygmomanometer is an instrument used to measure

   a) Glucose b) Hemoglobin c) Temperature d) Arterial pressure

5. Identify the active device amongst the following

   a) Transistor b) Resistor c) Capacitor d) Inductor

6. Transformer is a device used to

   a) Step-up voltage b) Step-down current

   c) Isolate one circuit with the other circuit d) All the above

7. In an RC circuit connected to DC source, voltage across the capacitor increase

   a) Linearly b) Exponentially

   c) Constantly d) Logarithmically

8. For a series resonant (LCR) circuit condition for resonance is

   a) $X_L > X_C$ b) $X_L < X_C$ c) $X_L = X_C$ d) $X_L \neq X_C$

9. Barrier voltage for Silicon diode is

   a) 0.3V b) 0.5V c) 0.6V d) 0.7V

10. A centre tapped full wave rectifier consists of

a) One diode b) Two diodes c) Three diodes d) Four diodes

11. A transistor consists of

a) One junction b) Two junctions c) Three junctions d) No junctions

12. A transistor has $\alpha = 0.99$ then its β is given by

a) 95 b) 98 c) 99 d) 100

13. A group of four bits is called

a) Bit b) Byte c) Word d) Nibble

14. Logic expression for the output of NOR gate is

a) $Y = \overline{A\,B}$ b) $Y = \overline{A + B}$ c) $Y = AB$ d) $Y = \overline{A}\,\overline{B}$

15. Technical document of a component is called

a) Data sheet b) Excel sheet c) Google sheet d) Work sheet

II. Fill in the blanks by choosing appropriate answer from those given in the bracket: 5 x 1 = 5

[a) filter b) frequency c) timing diagram d) chopper e) potentiometer]

16. DC to DC converters are called …….

17. Number of AC cycles completed in one second is called ……

18. Example for a variable resistor is ……

19. The circuit which eliminates ripples is called ……

20. A pictorial representation of inputs and output states of a logic circuit is called …..…

PART B

III. Answer any FIVE questions: 5 x 2 = 10

21. Silicon is more preferred than germanium in semi conductor devices fabrication, justify.
22. Compare ideal and practical voltage sources.
23. Mention any two advantages of digital thermometer.
24. Distinguish between self inductance and mutual inductance.
25. Determine cutoff frequency of a low pass filter circuit. Given R = 1 kΩ and C = 0.01 μF.
26. Mention any two applications of a diode.
27. What is an opto−coupler? Mention its one application.
28. Prove that $A + \overline{A}B = A + B$
29. Mention two important specifications of LED.

PART C

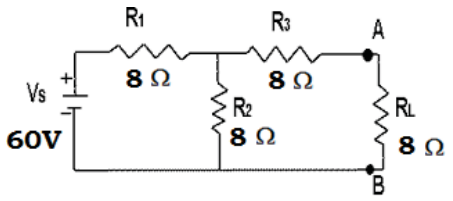
IV. Answer any FIVE questions: 5 x 3 = 15

30. Mention any three properties of charges.
31. How do you create 3 V, 2 V and 1 V from a 3 V source?.
32. The resistance of a coil made of copper wire is 100 Ω at 0 ºC. Calculate its resistance at 30 ºC. Given α = 0.004/ ºC.
33. Explain the construction of carbon composition resistor.
34. What is the reactance of a 3 μH inductor connected to an AC of 230 V, 50 Hz?
35. Write a note on formation of n−type semiconductor.
36. Construct LM317 variable voltage regulator circuit. Write the expression for its output voltage.
37. Compare the doping levels and physical sizes of emitter, base and collector layers of a transistor.
38. State and prove De−Morgan's Theorems.

PART D

V. Answer any FIVE questions: 5 x 5 = 25

39. Derive an expression for the effective capacitance of two capacitors connected in series.
40. Explain the construction and working of loudspeaker.
41. In a series RLC circuit explain variation of impedance with reference to frequencies.
42. Explain the working of positive clamper circuit.
43. Construct a bridge rectifier circuit and explain.
44. Explain working of two input AND gate.
45. Using Thevenin's theorem, find the load current and load voltage for the following circuit.



46. A transformer has 500 turns in the primary and 250 turns in the secondary. What is the turn's ratio? How much is the secondary voltage with a primary voltage of 230 V?

47. For the Zener diode voltage regulator with V_S = 20 V, R_S = 100 Ω, V_Z = 12 V, R_L = 680 Ω. Determine

    a. Load voltage

    b. Voltage drop across series resistance R_S

    c. Current through the Zener diode

48. Subtract 1111_2 from 11001_2 using 2's complement method. Also verify the same by direct subtraction method.

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