I PUC MODEL PAPER-2023-24

Subject: ELECTRONICS (40) **Maximum marks:70**

PART -A

I. Pick the right answer from the options given below **15 × 1= 15**

1. Electron was invented by

a. JJ Thomson b. Faraday c. Kirchhoff's d. Dr William Gilbert

2. Which of the following is the SI unit of charge

a. Coulomb b. Ampere c. Watt d. Ohms

3. The current flowing through a resistance of 2Ω, when a potential of 10V applied is?

a. 5A b. 5mA c. 0.5A d. 0.5mA

4. Color code of 220Ω resistor is

a. Orange, Orange, Red b. Red, Red, Red

c. Red, Red, Brown d. Red, Red, Orange

5. Capacitance of capacitor depends on which of the following parameters

a. Distance between the plates b. Permittivity of the medium

c. Area of the conductor d. All of the above

6. The Inductor doesn't allow sudden changes in

a. Voltage b. Current c. Resistance d. Inductance

7. Among these which is NOT a transducer?

a. Loud Speaker b. Microphone c. Camera d. Capacitor

8. Which among the following statements are true w.r.t. Inductor?
   Statement I: In the case of inductors reactance is directly proportional to frequency.
   Statement II: For DC inductors acts as a short circuit

a. Both I and II are false b. Both I and II are true

c. Only statement I is true d. Only statement II is true

9. For what value of Φ Average power of an AC signal in an LCR circuit will be zero

a. 0 degree b. 45 degrees c. 90 degrees d. 180 degrees

10. The output voltage of IC 7812 is

a. +12 V b. -12V c. +9V d. -9V

11. Semiconductor Diodes are used in rectifiers because.

a. Unidirectional device b. Zero On state resistance

c. It's a semiconductor device d. None of the above.

12. Which of the following terminals of BJT are lightly doped?

a. Base b. Collector c. Emitter d. None of the above.

13. In which of the following region do BJT operates as closed switch.

a. Active b. Cut-off c. Saturation d. Both a and c

14. $15_{(10)}$=_____ (2)

a. 1011 b. 1111 c. 1010 d. 1110

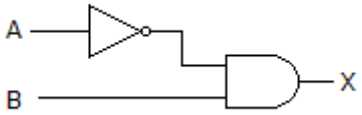
15. In which logic gate output is HIGH if one of the inputs is LOW?

a. AND b. OR c. NOR d. NAND

II. Fill in the blanks with choices given in the brackets. **5 x 1= 05**

(Pulse oximeter, LOW, 0.7V, Zero, ONE, ECG)

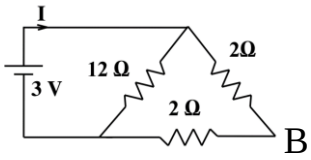
16. Value of internal resistance of an ideal voltage source _____
17. _____ is the instrument used to measure oxygen content in blood.
18. Value of permittivity of AIR is _____
19. _____ is the value of barrier potential of silicon semiconductor Diode
20. In the logic circuit given below If the input A=1, B=0, output will be _____.



PART B

III. Answer any Five questions **5 X 2 = 10**

21. Draw the V-I characteristics of a practical voltage source.
22. Find the resistance between A and B.



23. Mention two control knobs of a CRO and write its uses.
24. Distinguish between active and passive components.
25. List the factors on which self-inductance of a coil depend.
26. What is capacitive reactance and give the expression for the capacitive reactance.
27. Write the circuit of positive clamper and show the input and output waveforms.
28. Find the Binary equivalent of $(DADF)_{16}$?
29. List any four advantages of data sheet.

PART C

IV. Answer any Five questions **5 X 3 = 15**

30. Write a note on applications of electronics in medical field.
31. Define the following terms in an ac signal

a) Frequency b) Time period c) Peak Value

32. Explain the role of dielectric in capacitor construction.
33. Calculate the energy stored in the magnetic field of 100mH inductor with a current of 80 mA.
34. Briefly explain the formation of n-type semiconductors.
35. Design a regulated +12 V DC power supply.
36. Obtain a relation between α and β of a BJT.
37. State and prove De-Morgan's Theorems.
38. Draw the logic circuit for the given Boolean expression, $Y = \overline{\bar{A}B + BC}$.

PART D(SECTION - I)

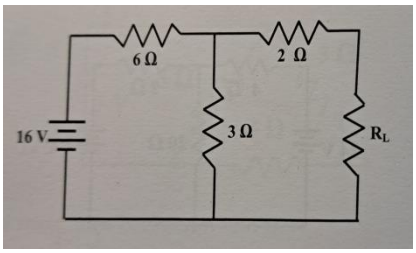
V. Answer any THREE questions **3 X 5 = 25**

39. State and explain Thevenin's theorem with an Example.
40. Explain the construction of Carbon microphone.
41. Explain low pass filter with its frequency response.
42. Explain the working of Full wave bridge rectifier with a neat circuit diagram.
43. Explain CE mode input and output characteristics of a NPN transistor. Distinguish between the cutoff, active and saturation regions of a transistor.
44. Explain with a DTL circuit the action of 2 input NAND gate

SECTION-II

VI. Answer any TWO questions **2 x 5 = 10**

45. What should be the value of load RL to abstract maximum power from 12 V battery? Hence determine the power transferred.



46. Two capacitors of capacitances 3 pF and 12 pF are connected in parallel across 30 V dc supply. Determine
    a) Effective capacitance of the combination
    b) the charge on eachcapacitor
    c) the total charge on the combination.
47. Calculate maximum and minimum values of Zener current if V_S = 60-80 V, R_S = 5 KΩ, V_Z = 12V and R_L = 5 KΩ
48. Subtract $23_{(10)}$ from $34_{(10)}$ using 2's complement method.

SUBJECT: ELECTRONICS (40) **BLUE PRINT** **CLASS-XI**

Chapters	No. of Hours	Marks	Remember					Understand					Apply				HOTS			
			MCQ 1M	SA 1M	SA 2M	LA 3M	LA 5M	MCQ 1M	SA 1M	SA 2M	LA 3M	LA 5M	MCQ 1M	SA 2M	LA 3M	LA 5M	MCQ 1M	SA 2M	LA 3M	LA 5M
Introduction to Electronics	4	4	1			1														
Principles of electricity	21	21	1		1		1T	2	1		1			1						1N
Measuring Instruments	4	3		1						1										
Passive electronic components	22	19	1			1	1T		1	1	1		1	1			1			
Application of AC and DC to passive components	14	14	1		1		1T									1N	1			
Semiconductors, diodes and applications of diodes	26	24	1			1			1		1	1T	1	1	1					1N
Bipolar junction transistor	7	7	1					1				1T								
Introduction to digital electronics	18	21	1		1				1		1	1T			1		1			1N
Practical electronic components and their specifications and PCB	4	2								1										
Total	120	115	07	01	6	9	15	3	4	6	12	15	02	6	6	05	03	0	0	15

SA 1M: FILL IN THE BLANKS N – Numerical Problems 1T – Essay Type

PATTERN OF QUESTION PAPER

Question type	Number of questions	Marks
PART –A MCQ	**15**	**15**
FILL IN THE BLANKS (SA 1M)	**05**	**05**
PART-B 2M	**09**	**18**
PART-C 3M	**09**	**27**
PART-D SECTION-I 5M(ESSAYTYPE)	**06**	**30**
SECTION-II 5M(PROBLEMS)	**04**	**20**
Total	**48**	**115**

WEIGHTAGE TO OBJECTIVES

COGNITIVE LEVEL	WEIGHTAGE	MARKS
REMEMBER	32%	37
UNDERSTANDING	35%	40
APPLY	17%	20
HOTS	16%	18
TOTAL		**115**

GENERAL GUIDELINES FOR SETTING THE QUESTION PAPER

1. **The question paper should be prepared on the basis of blueprint following the weightage of marks for each chapter. The questions must be framed to check the specific cognitive levels as mentioned in the blue print**
2. **Questions should be clear,unambiguous, understandable and free from grammatical errors.**
3. **The question should be framed using the contents in text book (Part of Syllabus),or content or concepts derived from the content only.**
4. **In MCQs the options should valid reliable and fair.**
5. **When the questions carrying 3marks or 5 marks are split, the question should be from the same chapter.**
6. **In PART-A(I main) 3 MCQs and in PART-D (section-II or VI main) 3 problems of the same difficulty level must be framed to check the HigherOrderThinkingSkills(HOTS).**
7. **One /Two simple numerical problems must be included in each of PART-B and PART-C**

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