

FIRST SEM B.Sc. DEGREE EXAMINATIONS
(NEP SYLLABUS)
SUBJECT: ELECTRONICS (ELECTIVE)
PAPER – 1. FUNDAMENTALS OF ELECTRONICS (ELEOEC01)

Max. marks: 60

Time: 2 hrs.

(Model Question Paper – 01)

Instructions to the candidates: Answer any TEN questions from Part A, any FIVE from Part B and any Five subdivisions from Part C.

PART A

Answer any TEN questions. Each question carries 2 marks

$10 \times 2 = 20$

1. Write the symbols for NPN and PNP transistors.
2. In which regions the transistor has to operate so that it acts as a switch?
3. What is the current gain of a transistor in CB and CE configuration?
4. What is dc load line and Q point?
5. In zener diode characteristics which current meter is used in Reverse bias (mA or μ A)?
6. If a transistor has current gain of 100 in CE mode what is the current gain in CB mode?
7. Draw the output wave form of full wave rectifier.
8. State Kirchhoff's current law.
9. Define Ohms law.
10. Write the symbol of ferrite core inductor.
11. Name any two donor dopants.
12. Write the symbol of LED.

PART B

Answer any Five Questions.

$5 \times 6 = 30$

13. a) Compare doping level, size and functions of three layers of a transistor.
What is meant by FR biasing of a transistor?
14. a) Define α and β of a transistor and derive the relation between them. What is the current gain in Common collector mode is called?
15. A transistor has $I_E = 4\text{mA}$ and $\alpha = 0.98$. Calculate the value of I_C , I_B and β if the leakage current if $I_{CBO} = 6\mu\text{A}$.
16. a) Derive an expression for the effective resistance of three resistors connected in series.
b) Distinguish between intrinsic and extrinsic semiconductors. (4+2)
17. What is a half wave rectifier? Explain the working of half wave rectifier with relevant diagram.
Draw input and output waveforms.
18. Draw the circuit of a fire alarm using a transistor and thermistor and explain its working.
19. Describe an experiment to draw V-I characteristics of a semiconductor diode.
20. Write the Principle and Procedure to verify the line regulation and load regulation using IC regulator – 7805.

(6)

PART C

Answer any Five subdivisions

5 x 2 = 10

21. a) Can you interchange emitter and collector of a transistor? Give reason.
- b) Why clock is very important in a digital circuit?
- c) Among Astable and Monostable multivibrator which one gives a rectangular waveform?
- d) Can you use IC 7910 to get +10V fixed output voltage? Give reason.
- e) What happens if secondary winding of a step down transformer is connected to ac mains? Justify.
- f) What happens if positive terminal of electrolytic capacitor is connected to negative terminal of a battery? Justify.
- g) On what factors the colour of the LED depend?

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FIRST SEM B.Sc. DEGREE EXAMINATIONS.....
(NEP SYLLABUS)

SUBJECT: ELECTRONICS (ELECTIVE)

PAPER – 1. FUNDAMENTALS OF ELECTRONICS (ELEOEC01)

Max. marks: 60

Time : 2 hrs.

(Model Question Paper – 2)

Instructions to the candidates: Answer any TEN questions from Part A, any FIVE from Part B and any Five subdivisions from Part C.

PART A

Answer any TEN questions. Each question carries 2 marks

10 X 2 = 20

1. Which regions of the transistor have highest doping level and highest size?
2. Draw the input characteristics of a transistor in CE configuration. Define input resistance.
3. Mention any two functions of a biasing circuit.
4. What do you mean by monostable multivibrator?
5. Mention any two components in the block diagram of IC 555.
6. Which are the two important components of the circuit for Automatic switching of street light?
7. State Kirchhoff's voltage law.
8. Write the symbol of electrolytic capacitor.
9. Write the equivalent circuit of a practical zener diode.
10. Name any two acceptor dopants.
11. Write the pin diagram of IC 555 timer.
12. Write the circuit diagram of LC filter.

PART B

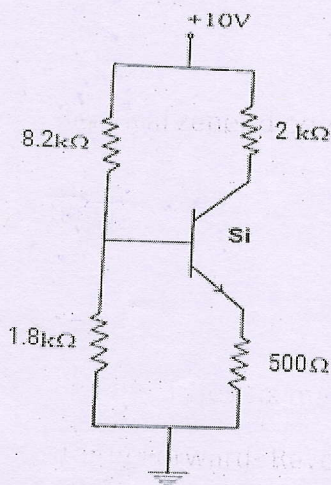
Answer any Five Questions. Each question carries six marks.

5 x 6 = 30

13. a) Explain the working of a transistor in Forward- Reverse (FR) biased condition.
b) Mention the two points to needed to draw the dc load line.
14. Determine the coordinates of the Q point in the following VDB circuit.

(4+2)

(6)



15. Derive an expression for the effective capacitance of three capacitors connected in series.
16. Explain forward and reverse biased PN junction with relevant diagrams.
17. What is a Full wave rectifier? Explain the working of bridge rectifier with relevant diagram.
Draw input and output waveforms.
18. Explain an experiment to determine ripple factor of a half wave rectifier.
19. Describe an experiment to draw zener diode characteristics in the laboratory.
20. Explain an experiment to determine frequency of astable multivibrator using IC 555.

PART C

Answer any Five questions. Each question carries two marks.

5 x 2 = 10

21. What does the arrow in the symbol of the transistor indicate?
22. Write the sequence that leads to thermal runaway in a transistor.
23. The door bell can be considered as mechanical equivalent of monostable multivibrator. Justify.
24. Can we connect transformer to a DC source? Justify your answer.
25. Give any two applications of a relay.
26. What is the value of the resistor if the colour code of the resistor is Yellow, Violet, Red and Silver?
27. In the output of a full wave rectifier two half cycles are not same. Give any two reasons.

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FIRST SEM B.Sc. DEGREE EXAMINATIONS
(NEP SYLLABUS)
SUBJECT: ELECTRONICS (OPEN ELECTIVE - ELEOEC04)
Basics of Electronics, Computers and PCB Design
(Model question Paper)

Time: 2 Hours

Marks: 60

Instructions to the candidates: Answer any **TEN** questions from Part-A, any **FIVE** questions from Part-B and any **FIVE** Subdivisions from Part-C.

PART-A

Answer any **TEN** questions.

10 x 2 = 20

1. What is earthing? What is the need of earthing?
2. Mention the various sources of energy.
3. What is a switch? What is the need for it?
4. What are the characteristics of computer?
5. Define the following. (a) Software (b) Hardware
6. Define (a) Nibble (b) Bit (c) Byte
7. Mention the types of PCB.
8. Write the fundamental rule for width of conductor for ground, supply line and signal line.
9. Mention any two basic artwork approaches.
10. Mention any two types of laminates.
11. Define Etch factor.
12. What is the need of Flux in soldering process.

PART-B

Answer any **FIVE** questions.

5 x 6 = 30

13. Explain the working of MCB.
14. Explain in brief, the electrical wiring connection to a home.
15. Explain basic functional units of computer briefly.
16. Explain the generation of computers briefly.
17. With neat diagram explain the composition of PCB.
18. Mention the advantages and disadvantages of Surface Mount technology.
19. With diagram, briefly explain Print and etch process for double sided PCBs.
20. What is soldering? Write a note on solder alloys.

(P.T.O)

PART-C

Answer any **FIVE** questions.

5 x 2 = 10

21. a) Differentiate between SPST and DPST. Draw the symbolic diagram.
- b) What is the need for a fuse? How does it work?
 - c) Differentiate between volatile and non-volatile memory?
 - d) What is a cache memory? What is the need for it?
 - e) Why is Copper used in PCB to make traces?
 - f) What is the purpose of using flux in soldering?
 - g) Why care should be taken while soldering a component in the PCB?
