Registration No.:_____

Course Code:ECE249

Course Title:BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Time Allowed: 3hrs. Max

Read the following instructions carefully before attempting the question paper.

1. Match the Paper Code shaded on the OMR Sheet with the Paper code mentioned on the question paper and ensure that both
same.
2. This question paper is divided into two parts A and B.
3. Part A contains 30 questions of 1 mark each. 0.25 marks will be deducted for each wrong answer.
4. Part B contains 5 questions of 10 marks each. Attempt any 4 questions out of these 5 questions. In case all the 5 questions are
then only the first four attempted questions will be evaluated.
5. Attempt all the questions in serial order.
6. Do not write or mark anything on the question paper except your registration no. on the designated space.
7. After completion of first 90 minutes, the OMR sheet will be taken by the invigilator.
8. Submit the question paper and the rough sheet(s) along with the answer sheet to the invigilator before leaving the examination

Q1) Part-A

(1) If Set and Reset, both are disabled in case of SR flip flop then ouput is_____

(a) Reset (b) Set (c) Previous output (d) Present input

(2) Each stage of Shift register is capable of storing _____

(a) 1 bit (b) 1 byte (c) 2 bit (d) 2 byte

(3) Synchronous counter is also called_____

(a) asynchronous counter (b) parallel counter (c) trip counter (d) tripple counter

(4) Identify the basic building block of Shift registers

(a) T flip flop (b) SR flip flop (c) JK flip flop (d) D flip flop

(5) Shift counter is also known as_____

(a) Johnson counter (b) Ripple counter (c) synchronus counter (d) Asynchronus counter

(6) The arrow direction in the diode symbol indicates

(a) Direction of electron flow.
(b) Direction of hole flow (Direction of conventional current)
(c) Opposite to the direction of hole flow
(d) None of the above

(7) A semiconductor is formed by ..... bonds.

(a) Covalent (b) Electrovalent (c) Co-ordinate (d) None of the above

(8) A semiconductor has ..... temperature coefficient of resistance.

(a) Positive (b) Zero (c) Negative (d) None of the above

(9) Which region is heavily doped in case of BJT.

(a) Collector (b) Base (c) Emitter (d) Gate

(10) The input resistance of common base BJT is of the order of
(a) 100 ohm (b) 1000 ohm (c) 10 ohm (d) 1 ohm

(11) MOSFET is ideal for :
(a) Low switching frequency (b) High switching frequency
(c) Low voltage applications (d) medium voltage applications

high switching frequency

(12) Which of the following does not belong to MOSFET?
(a) Drain (b) Gate (c) Base (d) Source

(13) Which of following is universal GATE
(a) NAND (b) XOR (c) EXOR (d) OR

(14) Simplify A(A + B)
(a) AB (b) 1 (c) (1 + AB) (d) A

absorption law

(15) The output will be a LOW for any case when one or more inputs are zero in a/an .....
(a) OR Gate (b) NOT Gate (c) AND Gate (d) NAND Gate

(16) A decoder converts n inputs to _____ outputs.
(a) n (b) 2^n (c) n+1 (d) 2^{n+1}

(17) Which of the following can be represented for decoder?
(a) Sequential circuit (b) Combinational circuit (c) Logical circuit (d) None of the mentioned

(18) The standard TTL gates are marketed as _____ series.
(a) 80 (b) 82 (c) 74 (d) 08

(19) CMOS gates are commercially available as which of the following series?
(a) 1000 (b) 3000 (c) 2000 (d) 4000

(20) Which logic gate has low power consumption?
(a) RTL (b) TTL (c) DTL (d) CMOS

(21) Latch can be called Memory device as it has the capability of _____
(a) storing 1-bit (b) storing 1-byte (c) storing 16-bit (d) storing 24-bit

(22) R indicates_____ in SR-latch.
(a) Re-arrange (b) Reset (c) Recombine (d) Residue

(23) The number of input s in case of D-flip flop is/are:
(a) 1 (b) 3 (c) 2 (d) 4

(24) Identify the flip flop which can be used to make D-flip flop
(a) JK (b) SR (c) T (d) MS

(26) The output of sequential circuit depends on
(a) Present input (b) Past output (c) Present and Past output (d) Present input and Past output

CO5, L5

(27) Which of the following logic expressions represents the logic diagram shown?
(a) X=AB'+A'B (b) X'(AB)'+AB (c) X'(AB)'+A'B' (d) X=A'B'+AB

CO5, L5

(28) A two bits adder contains
(a) 3 combinational input (b) 4 combinational inputs (c) 6 combinational inputs (d) 8 combinational inputs

CO5, L5

(29) What is a multiplexer?
(a) It is a type of decoder which decodes several inputs and gives one output
(b) A multiplexer is a device which converts many signals into one
(c) It takes one input and results into many output
(d) It is a type of encoder which decodes several inputs and gives one output

CO5, L5

(29) In parts of the processor, adders are used to calculate _____
(a) Addresses (b) Table indices (c) Increment and decrement operators (d) All of the Mentioned

CO5, L5

(30) Total number of inputs in a half adder is _____
(a) 2 (b) 3 (c) 4 (d) 1

CO5, L5

Part-B

Q1 (a) Explain: (i) Phase voltage and Inline voltage (ii) rms value of AC signal with the help of relevant example
(b) Explain the power calculation in RL, RC, and RLC circuits with the help of relevant example

CO2, L1, [10 marks]

Q2 (a) Explain the working principle of DC motor. Write the different types of DC motor.
(b) Explain single and three phase induction motors.

CO1, L2, [10 marks]

Q3 Explain intrinsic and extrinsic types of semiconductors, how n, p-type semiconductors are made? Explain majority, and minority charge carriers in both cases. Explain the donor and acceptor ions also.

CO1, L2, [10 marks]

Q4 Design full adder with half adders and full subtractor with half subtractors, you can use other required logic gates also.

CO4, L4, [10 marks]

Q5 Explain JK flip-flops in detail, along with their Truth-Table and logic diagram. Also, explain what is Race around condition and how can be avoided.

CO4, L4, [10 marks]

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–End of Question paper–

75–80 %. 4%.
81–85%. 6%.
86%–90%. 8%.
90%.— 10%.

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