Registration No.:_____

Paper Code: A

Course Code:ECE249

Course Title:BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

Time Allowed: 3hrs. **Max Marks: 70**

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 are the 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 attempted 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 hall.

Part-A

Q1) (1) An ideal diode under reverse bias condition operates as_____

(a) open switch (b) closed switch (c) either open switch or closed switch (d) None of these

CO4, L4

(2) An ideal diode under forward bias condition operates as_____

(a) closed switch (b) open switch (c) either open switch or closed switch (d) None of these

CO4, L4

(3) If the voltage across the p-type and n-type terminals of a diode is 5 V and 2 V respectively. This diode is operating in_____.

(a) reverse bias (b) forward bias (c) both in forward bias and reverse bias (d) none of these

CO4, L4

(4) Enhancement mode is present in_____

(a) MOSFET (b) JFET (c) Tunnel diode (d) pn junction diode

CO4, L4

(5) The concept of virtual ground is applicable in_____

(a) BJT (b) MOSFET (c) Diode (d) Operational Amplifier

CO4, L4

(6) MOSFET acts as an amplifier in_____

(a) saturation region (b) active region (c) cut-off region (d) None of these

CO4, L4

(7) BJT acts as an amplifier in_____

(a) saturation region (b) active region (c) cut-off region (d) None of these

CO4, L4

(8) A XOR B is equivalent to_____

(a) A XNOR B (b) Complement of (A XNOR B) (c) A OR B (d) None of these

CO4, L4

(9) A XOR B XOR C is equivalent to_____

(a) A XNOR B XNOR C (b) Complement of (A XNOR B XNOR C) (c) A.B.C (d) None of these

CO4, L4

(10) The BJT as acts a closed switch in_____

(a) linear region (b) cut-off region (c) saturation region (d) None of these

CO4, L4

(11) XOR gate is also called _____
(a) Inverter (b) amplifier (c) comparator (d) BCD

CO5, L5

(12) The number of inputs in case of Half adder are_____
(a) 1 (b) 2 (c) 3 (d) 4

CO4, L5

(13) Carry is obtained in case of:
(a) Subtraction (b) Addition (c) Multiplication (d) Both addition and subtraction

CO5, L5

(14) The binary addition of 1 + 1 =?
(a) Sum = 1, Carry = 1 (b) Sum = 0, Carry = 0 (c) Sum = 1, Carry = 0 (d) Sum = 0, Carry = 1

CO5, L5

(15) Number of AND gates required to for a 1 to 8 Mux
(a) 2 (b) 6 (c) 8 (d) 10

CO5, L5

(16) 1 to 8 Demux require _____ select lines.
(a) 2 (b) 3 (c) 4 (d) 5

CO5, L5

(17)_____NOT gates will be required for 4 to 1 MUX
(a) 3 (b) 1 (c) 2 (d) 4

CO5, L5

(18) Identify the building blocks for Encoder.
(a) OR gate (b) AND gate (c) XOR gate (d) NOR gate

CO5, L5

(19) Identify the type of circuit for decoder?
(a) Logical circuit (b) Sequential circuit (c) Combinational circuit (d) None of the mentioned

CO5, L5

(20) TCTL stands for:
(a) Transistor-complementary transistor logic (b) Transistor-complemented transistor logic
(c) Transistor-capacitor transistor logic (d) Transistor-coupled transistor logic

CO5, L5

(21) D flip-flop is also known as_____flip-flop.
(a) transparent (b) TTL (c) non-transparent (d) None of these

CO5, L5

(22) T flip-flop is known as_____flip-flop.
(a) Toggle (b) Transparent (c) Set-Reset flip-flop (d) None of these

CO5, L5

(23) The output of JK flip-flop when J=1, K=1, and present state output=1 is_____
(a) 1 (b) 0 (c) Both 1 and 0 (d) None of these

CO5, L5

(24) The output of SR flip-flop when S=1, R=1, and present state output=1 is_____
(a) Invalid State (b) Memory State (c) Toggle State (d) Race Around Condition

CO5, L5

(25) The race around condition is related with_____
(a) SR flip-flop (b) JK flip-flop (c) D flip-flop (d) T flip-flop

CO5, L5

(26) The one of the major differences between flip-flop and latch is that a flip-flip is _____ while the latch is_____

(a) level triggered, edge triggered (b) edge triggered, level triggered
(c) level triggered, level triggered (d) edge triggered, edge triggered

CO5, L5

(27) In_____ there are different clock signals used to produce the output.

(a) Asynchronous counters (b) Synchronous counters
(c) BothAsynchronous counters and Synchronous counters (d) None of these

CO5, L5

(28)
A_____ is a_____ in which the output from the last flip flop is inverted and fed back as an input to the first.

(a) Johnson counter,modified ring counter (b) modified ring counter, Johnson counter
(c) Johnson counter,Johnson counter (d) ring counter, modified ring counter

CO5, L5

(29) The next state output of D flip-flop when input D=1 and present state output=1 is_____

(a) 0 (b) 1 (c) Invalid State (d) None of these

CO5, L5

(30) The next state output of T flip-flop when T=1 and present state output=1 is_____

(a) 1 (b) 0 (c) Invalid State (d) None of these

CO5, L5

Part-B

Q2) Perform steady state analysis on RLC circuits.

CO2, L1, [10 marks]

Q3) Explain the working principle of electric machines in detail.

CO1, L2, [10 marks]

Q4) Explain Op-amps and their ideal characteristics, what do you understand by inverting and non-inverting configuration of Op-amp?

CO1, L2, [10 marks]

Q5) Explain Multiplexer (MUX) in detail. Show how a 32 X 1 MUX can be implemented using 8 X 1 and 4 X1 MUX.

CO4, L4, [10 marks]

Q6) Design a Mod-12 Asynchoronous counter with the help of JK flip-flop. Draw its waveform and truth table also.

CO4, L4, [10 marks]

--End of Question paper--