

Total No. of Questions – [4]

Total No. of Printed Pages: 03

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PAPER CODE	V111-203B (RE)
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DECEMBER 2021 (INSEM+ ENDSEM) EXAM
F.Y. B. TECH. (SEMESTER - I)
COURSE NAME: BASIC ELECTRONICS ENGINEERING
COURSE CODE: ET10203B
(PATTERN 2020)

Time: [2Hr]

[Max. Marks: 60]

(*) Instructions to candidates:

- 1) Figures to the right indicate full marks.
- 2) Use of scientific calculator is allowed
- 3) Use suitable data where ever required

- Q.1
- Solve the following
 - i) In Half Wave Rectifier, if peak value of output is 17.5 V, then the peak value of its input is _____ [2]
 - a) 17.5 V
 - b) 22.5 V
 - c) 16.8 V
 - d) 18.2 V
 - ii) If the a.c. input to a half-wave rectifier is an r.m.s value of $400/\sqrt{2}$ volts, then diode PIV rating is----- [2]
 - a) $400/\sqrt{2}$ V
 - b) 400 V
 - c) $400 \sqrt{2}$ V
 - d) 200 V
 - iii) Two LED's are connected in series along with limiting resistance. It is supplied with 10 V DC supply and drop across each LED is 2V, the value of limiting resistance for 20 mA current is----- [2]
 - a) 200 Ω
 - b) 250 Ω
 - c) 300 Ω
 - d) 400 Ω
 - iv) The internal quantum efficiency of LEDs decreasing _____ with _____ temperature. [2]
 - a) Exponentially, decreasing
 - b) Exponentially, increasing
 - c) Linearly, increasing
 - d) Linearly, decreasing

- v) What is the minimum PIV rating of each diode in center tap full wave rectifier, if its $V_p(\text{out})$ is equal to 24.3 V? [2]
 a) 49.3 V
 b) 24.7 V
 c) 48.6 V
 d) 1.4 V
- vi) Determine the peak output voltage for the full wave bridge rectifier. Assume silicon diode. The transformer is specified to have a 10 V rms secondary voltage and 120 V across the primary winding. [2]
 a) 8.6 V
 b) 12.74 V
 c) 14.14 V
 d) 93.7 V
- vii) Determine the PIV rating for the full wave bridge rectifier. Assume all four are silicon diodes. The transformer is specified to have a 12 V rms as secondary voltage for the standard 140 V across the primary. [2]
 a) 16.3 V
 b) 10 V
 c) 8.2 V
 d) 15 V
- viii) The average value of Half-Wave rectified output voltage is _____ if its peak output voltage is 30V. [2]
 a) 20.28 V
 b) 20.43V
 c) 9.54 V
 d) 59.3 V
- ix) In a transistor, $I_C = 100 \text{ mA}$ and $I_E = 100.2 \text{ mA}$. The value of β is [2]
 a) 50
 b) 500
 c) 100
 d) 200
- x) In a transistor if $\beta = 100$ and collector current I_C is 10 mA, then the emitter current I_E is [2]
 a) 100.1 mA
 b) 110 mA
 c) 10.1 mA
 d) 15 mA
- xi) The current gain (β) of a transistor in common emitter configuration is 40. If the collector current changes by 160mA, then required change in the base current isfor constant VCE. [2]
 a) 4 mA
 b) 0.4 mA
 c) 40 mA
 d) 4 A

- xii) In RC phase shift oscillator producing output at $f = 500 \text{ Hz}$, $R = 7.5 \text{ Kohm}$ then $C = \text{----}$. [2]
 a) 0.01 micro F
 b) 0.017 micro F
 c) 0.012 nano F
 d) 0.001 micro F
- xiii) Determine value of collector current I_c , for $\beta = 150$ and base current $I_B = 430 \mu\text{A}$. [2]
 a) 100 mA
 b) 46.8 mA
 c) 64.5 mA
 d) 80.3 mA
- xiv) For voltage divider biasing circuit, if $R_1 = 18 \text{ K}\Omega$, $R_2 = 4.7 \text{ K}\Omega$, $V_{CC} = 10\text{V}$. What is the value of V_B (voltage at Base terminal) ? [2]
 a) 2.07 V
 b) 3.23 V
 c) 10 V
 d) 5.1 V
- xv) In Common Emitter amplifier, if base current is 10 mA and beta is 100. What is the value of collector current? [2]
 a) 1 mA
 b) 1000 micro A
 c) 1 A
 d) 10 nano A

Q2

Solve any three questions out of four

- a) Sketch the internal structure of p-channel Enhancement type MOSFET and explain its transfer characteristics? [5]
- b) Calculate V_{GS} and V_{DS} for the circuit, with $R_1 = 100 \text{ K}\Omega$, $R_2 = 15 \text{ K}\Omega$, $R_D = 200 \Omega$, $R_S = 0 \Omega$, $V_{DD} = 20 \text{ V}$. Assume this particular MOSFET has minimum values of $I_{D(on)} = 200 \text{ mA}$ at $V_{GS} = 4 \text{ V}$ and $V_{GS(th)} = 2 \text{ V}$. [5]
- c) Draw and explain its V-I characteristics of TRIAC. [5]
- d) Draw and explain Turn OFF process of SCR with circuit diagram [5]

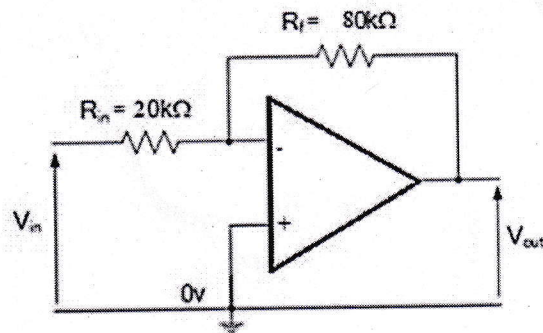
Q.3

Solve any three questions out of four

- a) Draw op-amp symbol and explain the importance of its each terminal. [5]
- b) Explain the following terms related to a op-amp with necessary diagrams [5]
 i) Virtual ground
 ii) Slew Rate

- c) Calculate closed loop gain of the circuit shown below and also find out its output voltage if 1.5 Vdc input is applied to the circuit.

[5]



- d) Draw the circuit diagram and sketch the output waveforms of op-amp comparator.

[5]

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