Total No. of Questions – [3] Total No. of Printed Pages: 04

G.R. No.	

PAPER CODE	U111 – 203B CRF9

MAY 2022 (INSEM+ ENDSEM) EXAM
F.Y. B. TECH. (SEMESTER - II)
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) A half-wave rectifier has an input voltage of 240 V r.m.s. If the step-down transformer has a turns ratio of 8:1, what is the peak load voltage? (consider Si diode drop) [2]
a) 27.5 V
b) 86.5 V
c) 41.7 V
d) 42.4 V

iii) A forward potential of 15V is applied to a Si diode. A resistance of 5 KΩ is also in series with the diode (Assume practical diode model). The current is---- [2]
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a) 2.86 mA
b) 1.5 mA
c) 3 mA
d) 0.7 mA

iv) A half-wave rectifier with Si diode has input voltage of 170 V peak. If the step-down transformer has turns ratio of 2:1, what is the peak output voltage? [2]
a) 48.3 V
b) 40.7 V
c) 84.3 V
d) 1.4 V

v) What is the minimum PIV rating of each diode in center tap full wave rectifier, if its Vp(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 20 V. [2]
a) 20.28 V
b) 6.37V
c) 9.54 V
d) 20.7 V

ix) In a transistor, I_C = 100 mA and I_E = 100.2 mA. The value of β is ..... [2]
a) 50
b) 500
c) 100
d) 200

x) In a transistor if β = 100 and collector current Ic is 10 mA, then the emitter current IE 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 is .....for 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 Hz, R = 7.5 Kohm then C = ----.
a) 0.01 micro F
b) 0.017 micro F
c) 0.012 nanoF
d) 0.001 micro F

xiii) Determine value of collector current Ic, for β=150 and I_B= 430 μA. [2]
a) 100 mA
b) 46.8 mA
c) 64.5 mA
d) 80.3 mA

xiv) For voltage divider biasing circuit, if R1=100 KΩ, R2= 15 KΩ, VCC=24V. [2]
What is the value of VB (voltage at Base terminal) ?
a) 3.13 V
b) 4.53 V
c) 24 V
d) 12 V

xv) For a BJT fixed bias circuit, determine base current I_B, if V_{BB}=5V V_{BE} = 0.7V [2]
and R_B = 10KΩ.
a) 650 μA
b) 430 μA
c) 340 μA
d) 100 μA

Q.2 **Solve any three questions out of four**

a) Sketch the internal structure of n-channel Enhancement type MOSFET and explain its transfer characteristics? [5]

b) Calculate V_{GS} and V_{DS} for E-MOSFET voltage divider biasing circuit, with R_1=200 KΩ , R_2=20 KΩ, R_D= 200 Ω, Rs=0 Ω and V_{DD} = 20 V. Assume this particular E-MOSFET has minimum values of $I_{D(on)}$ = 200 mA at V_{GS} = 4 V and $V_{GS(th)}$ = 1 V. [5]

c) Draw and explain V-I characteristics of SCR for different values of gate current. [5]

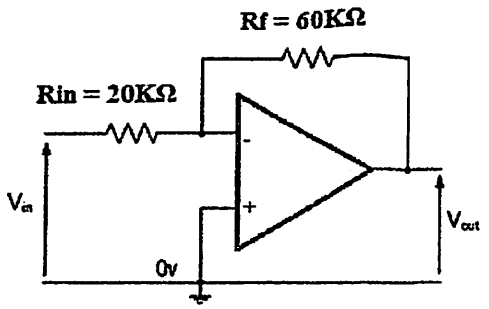
d) Draw and explain Turn OFF process of SCR with circuit diagram [5]

Q.3 **Solve any three questions out of four**

a) Draw op-amp IC 741 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 V of DC input signal is applied to the circuit. [5]



d) With the help of block diagram explain different blocks of OPAMP. [5]

END