G.R. No.	

PAPER CODE	U 113 – 2032 (B

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) If the a.c. input to a half-wave rectifier is an r.m.s value of 200/√2 volts, then diode PIV rating is------- [2]
a)) 200/√2 V
b) 200 V
c) 400 √2 V
d) 400 V

ii) Two LED's are connected in series along with limiting resistance. It is supplied with 12 V DC supply and drop across each LED is 1.5 V, the value of limiting resistance for 10 mA current is----- [2]
a) 400 Ω
b) 750 Ω
c) 900 Ω
d) 600 Ω

iii) In Center tapped full wave rectifier, if the peak value of secondary voltage is 25 V then the peak value of the output voltage is ____ [2]
a) 24.3 V
b) 11.8 V
c) 25.7 V
d) 12.5 V

iv) What is the average value of full wave rectifier, for Vp(out)= 50V [2]
a) 31.85 V
b) 45.65 V
c) 50.7 V
d) 15.9 V

v) Each diode in a center-tapped full-wave rectifier is _____ -biased and conducts [2]
for _____ of the input cycle.
    a) forward, 90 degrees
    b) forward, 180 degrees
    c) reverse, 90 degrees
    d) reverse, 360 degrees

vi) In Half Wave Rectifier, if peak value of output is 12.5 V, then the peak value of it's [2]
input is _____
    a) 12.5 V
    b) 22.5 V
    c) 11.8 V
    d) 13.2 V

vii) In Center tapped FWR, if the peak value of secondary voltage is 50 V then the peak [2]
value of the output voltage is _____
    a) 24.3 V
    b) 20.8 V
    c) 50.7 V
    d) 49.3 V

viii) The current flowing through the Photo diode without illumination of light in reverse [2]
bias mode is called as ----------------
    a) reverse current
    b) dark current
    c) forward current
    d) pinch off current

ix) Determine value of collector current Ic, for $\beta=180$ and base current $I_B= 25$ μA. [2]
    a) 10 mA
    b) 0.45 mA
    c) 4.5 mA
    d) 45 μA

x) For voltage divider biasing circuit, if R1=1.5 KΩ R2= 680 Ω, VCC=10V. What is [2]
the value of VB (voltage at Base terminal) ?
    a) 3.12 V
    b) 6.23 V
    c) 10 V
    d) 0.7 V

xi) In Common Emitter amplifier, if base current is 40 μA and beta is 50. What is the [2]
value of collector current?
    a) 20 mA
    b) 200 uA
    c) 2 A
    d) 2 mA

.xii) In voltage divider biasing circuit using BJT, if V_E=1.4 V and R_E=700 Ω. What is   [2]
the value of emitter current I_E?
a) 1.4 mA
b) 2 A
c) 2 mA
d) 20 mA

xiii) What is the phase shift between input and output signal for BJT Common Emitter   [2]
configured amplifier?
a) 90°
b) 180°
c) 270°
d) 360°

xiv) The biasing circuit has a stability factor of 35. If due to temperature change, ICBO   [2]
changes by 2 μA, then IC will change by ....
a) 7 μA
b) 7.2 μA
c) 0.7 μA
d) 70 μA

xv) In transistor amplifier circuit, if 14 V of V_{CC} is applied, then for maximum   [2]
amplification of input signal at its output, what value of V_{CE} is required?
a) 14 V
b) 0.7 V
c) 7 V
d) 1.4 V

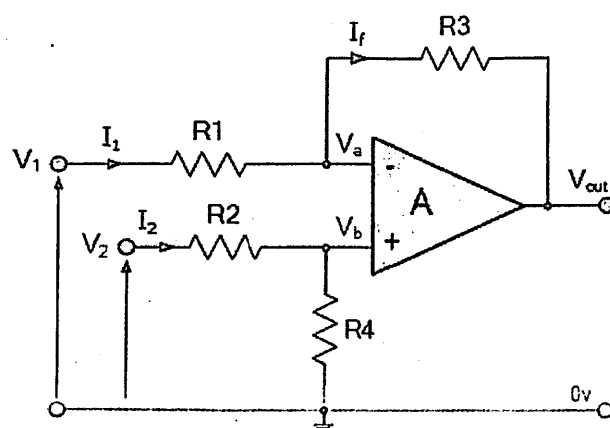**Q.2** **Solve any three out of four**

a) Sketch the internal construction of an n-channel Enhancement type of MOSFET   [5]
and draw the output I-V characteristics of n-channel E-MOSFET.

b) Draw Common Source amplifier circuit with voltage divider biasing using n-   [5]
channel E-MOSFET and explain the significance of coupling and bypass capacitors
connected in the circuit.

c) Calculate V_{GS} and V_{DS} for the MOSFET with voltage divider bias circuit, given   [5]
parameters are R_1 = 100 KΩ, R_2 = 15 KΩ, R_D = 200 Ω, V_{DD} = 24 V. Assume this
particular MOSFET has minimum values of $I_{D(on)}$ = 200 mA at V_{GS} = 4 V and
$V_{GS(th)}$ = 2 V.

d) Sketch the forward characteristics of SCR for different values of gate current and explain   [5]
turn on process of it.

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

a) Sketch the block diagram of op-amp and explain the working of each block.   [5]

b) Compare between Inverting and non inverting amplifier configurations of an op-amp. [5]

c) Draw the diagram of inverting amplifier configuration using an op-amp and derive the expression for its gain. [5]

d) For the given Op-amp as sub-tractor circuit diagram, the values mentioned are $V_1=2V$, $V_2=5V$, $R1=2$ KΩ, $R2=2$ KΩ, $R3=10$ KΩ, $R4=4$ KΩ. Find the output voltage Vout. [5]

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