Total No. of Questions – [4]

Total No. of Printed Pages: 04

G.R. No.	

PAPER CODE	U111-203B (Back)

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**

- **Solve the following**

Q.1 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? Ignore diode drop. [2]

a) 27.5 V
b) 86.5 V
c) 30 V
d) 42.4 V

iii) A forward potential of 10V is applied to a Si diode. A resistance of 1 KΩ is also in series with the diode. The current is---------- [2]

a) 9.3 mA
b) 10 mA
c) 1 mA
d) 0.7 mA

iv) To get a peak load voltage of 40V out of a bridge rectifier. What is the approximate rms value of secondary voltage? [2]

a) 0 V
b) 14.4 V
c) 29.3 V
d) 56.6 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 30V. [2]

a) 20.28 V
b) 20.43V
c) 9.54 V
d) 59.3 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 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 is .....for constant V_{CE}. [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 KΩ then C = ----. [2]
a) 0.01 micro F
b) 0.017 micro F
c) 0.012 nF
d) 0.001 micro F

xiii) If the collector supply is 12 V, then collector cut off voltage under d.c. conditions is ..... [2]
a) 24 V
b) 0 V
c) 6 V
d) 12 V

xiv) The CC configured transistor amplifier has ------input impedance and ------output impedance. [2]
a) very high, very low
b) very low, very high
c) very high, very high
d) very low, very low

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

Q2 **Solve any three questions out of four**

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

b) Calculate V_{GS} and V_{DS} for the circuit, with R_1 = 100 KΩ , R_2 = 15 KΩ, R_D = 200 Ω, VDD = 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. [5]

c) Calculate drain current when V_{GS} = 6V for an E-MOSFET with $I_{D(on)}$ = 600 mA at V_{GS} = 10V and $V_{GS(th)}$ = 5V. [5]

d) Explain Turn ON process of SCR with circuit diagram [5]

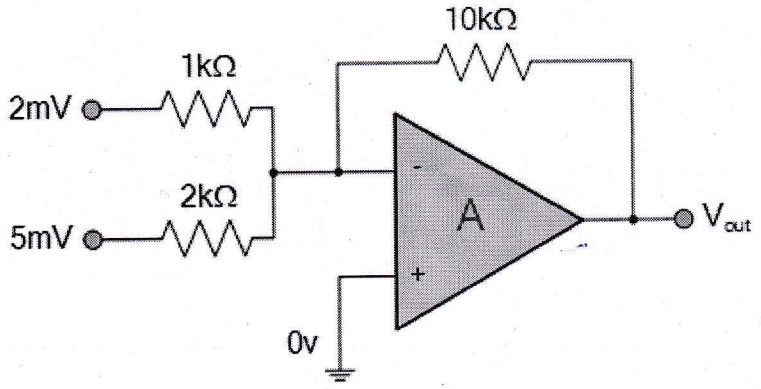
Q3 **Solve any three questions out of four**

a) Draw block diagram of op-amp and state ideal characteristics. [5]

b) Define the following terms related to a differential amplifier. [5]
i) Differential gain
ii) Common-mode gain

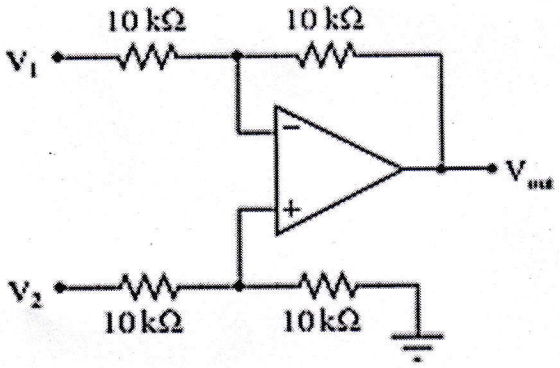
c) If two input voltages are applied at inverting terminal. Find the output voltage V_{out}.

[5]



d) If V_1= 2V and V_2 = 1.5V, calculate the output voltage.
Also calculate output for the values of V_1= -2V and V_2 = 4V.

[5]



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