1859553

M – 2020

Register Number : | | | | | | |

Subject Code : 40 (NS)

ELECTRONICS

Time : 3 Hours 15 Minutes] [Total No. of questions : 37] [Max. Marks : 70

Instructions : i) *Question paper has four Parts A, B, C and D.*

ii) *Part - A has no choice.*

iii) *Part - D has two Parts.*

I – problems.

II – essay type questions.

iv) *Draw the circuit diagrams wherever necessary.*

v) *Read the instructions given for each part.*

PART – A

Answer **all** questions : **(10 × 1 = 10)**

1) Draw the symbol of P-channel JFET.

2) What is heat sink?

3) Mention the principle used in crystal oscillator.

4) Define silent zone in a radio communication.

P.T.O.

5) How many side bands are present in AM–wave?

6) What is the value of IF for FM – Receiver?

7) What is meant by redundant group?

8) Convert $(1100)_2$ into Gray code.

9) What is the size of an integer in C–programming?

10) Expand CDMA.

PART – B

Answer **any five** questions : **(5 × 2 = 10)**

11) Mention the different types of transistor biasing.

12) Write the steps involved in DC–equivalent circuit of a CE–amplifier.

13) What are the advantages of negative feedback amplifier?

14) Define CMRR. Give its value for ideal Op–Amp.

15) State the Barkhausen criterion for sustained oscillations.

16) Mention different types of addressing modes in 8051.

17) Write the syntax for 'if–else' statement.

18) Mention the important techniques used for Bluetooth operation.

PART – C

Answer **any five** questions : **(5 × 3 = 15)**

19) Explain the working of N-channel JFET.

20) Derive the expression for input impedance for voltage series negative feedback amplifier.

21) Draw the circuit diagram and explain Op–Amp as an inverting amplifier.

22) Explain the role of Ionosphere in a radio communication.

23) Draw the circuit diagram and explain the working of a linear diode detector.

24) At what firing angle does SCR of FWR must be triggered to supply V_{dc} = 60V to a load ; Given V_{rms} = 110V.

25) Explain the operations of power diode under forward biased condition.

26) Explain with diagram the working of satellite transponder system.

PART – D

(3 × 5 = 15)

I. Answer **any three** questions :

27) For the given CE amplifier circuit using germanium transistor.

Calculate

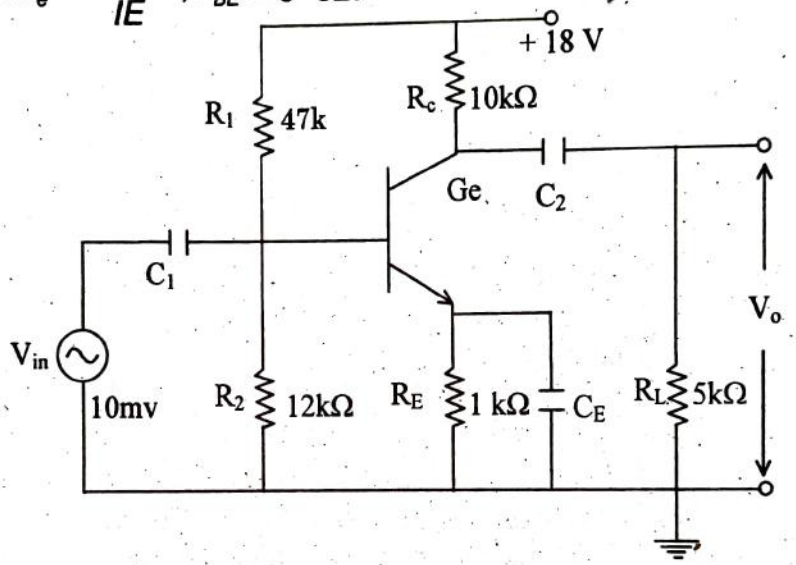
a) V_2

b) I_E

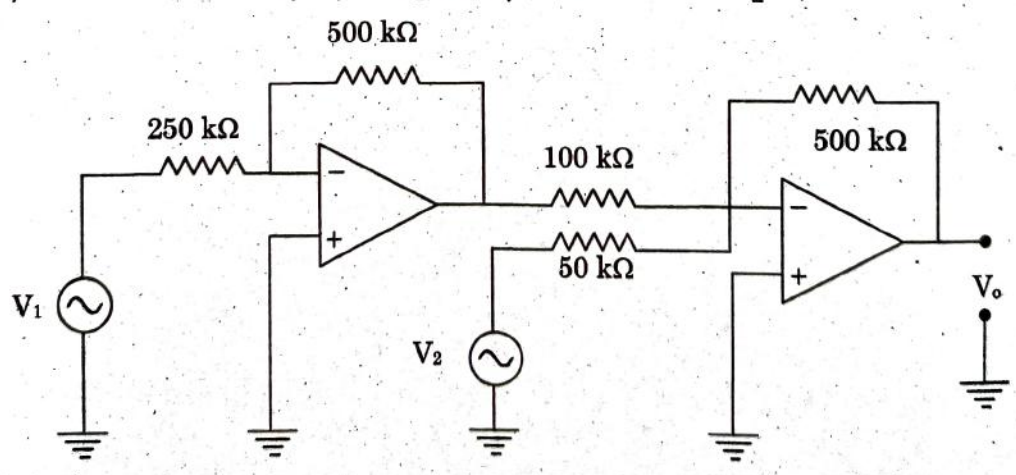
c) r'_e

d) Av

Given $r'_e = \frac{52mV}{IE}$, $V_{BE} = 0 \cdot 32v$



28) Calculate the output voltage if $V_1 = 300mv$ and $V_2 = 700mv$



29) A transistor colpitts oscillator has L=10mH, $C_1 = 0.1\mu F$ and $C_2 = 0.1\mu F$. Determine the frequency of oscillations.

30) A frequency modulated signal is

given $V_{FM} = 10 \sin [6 \times 10^8 t + 5 \sin 1250 t]$

Determine

a) carrier frequency

b) modulating frequency

c) modulation index

d) maximum frequency deviation and

e) power dissipated in a 5Ω resistor.

31) Simplify the Boolean expression. $Y = \sum m(0,1,4,13,15) + \sum d(2,5,7)$ and then draw the logic diagram using only basic gates.

II. Answer **any four** questions: **(4 × 5 = 20)**

32) Explain with circuit diagram, the working of two stage direct coupled CE – amplifier. Draw the frequency response of it.

33) a) What is a differentiator of Op–Amp?

b) Derive an expression for output voltage of an Op–Amp differentiator. **(1+4)**

34) a) What is the principle of superhetrodyne AM–receiver.

b) Explain the functions of each block of superhetrodyne AM–receiver. **(2+3)**

35) What is Full adder? Draw the circuit of Full adder using three input XOR gate and basic gates. Write its truth table.

36) Write an assembly language program to multiply O8H and OBH. What are the contents of register A and register B after the execution of the program.

37) (a) What is de–bugging?

(b) Explain the different types of errors that occur in C–programming language. **(1+4)**