New Scheme:

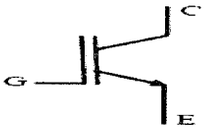
GOVERNMENT OF KARNATAKA

KARNATAKA STATE PRE-UNIVERSITY EDUCATION EXAMINATION BOARD

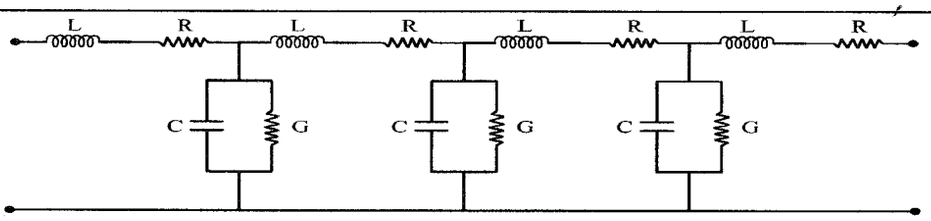
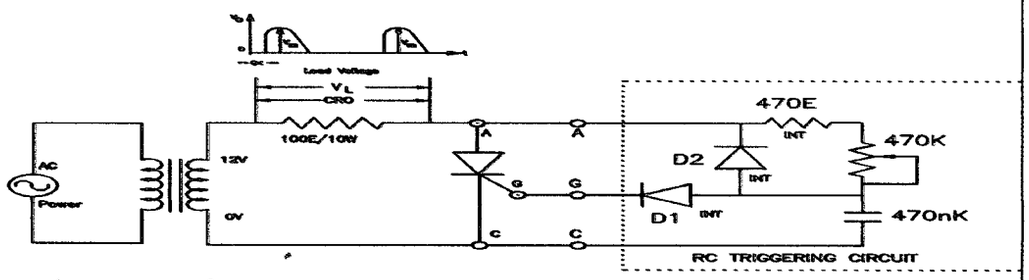
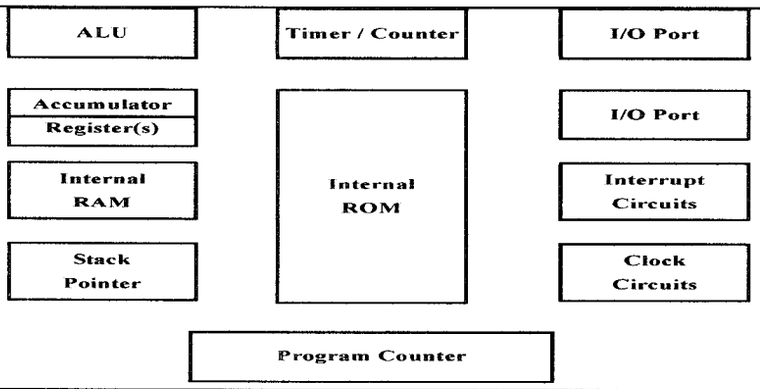
II YEAR PUC EXAMINATION

SCHEME OF VALUATION March 2017

Subject code: 40(NS) Subject: Electronics

<table>
<tr><th>Qn No</th><th>Part-A</th><th>Marks</th></tr>
<tr><td>1</td><td>Source supplies charge carriers for the conduction</td><td>1</td></tr>
<tr><td>2</td><td>Class- A Power amplifier.</td><td>1</td></tr>
<tr><td>3</td><td>It is the rate of change of output voltage with time.</td><td>1</td></tr>
<tr><td>4</td><td>5 KHz</td><td>1</td></tr>
<tr><td>5</td><td>The process of recovering original modulating signal from modulated wave.</td><td>1</td></tr>
<tr><td>6</td><td> 
</td><td>1</td></tr>
<tr><td>7</td><td>A logic circuit used for counting the pulses.</td><td>1</td></tr>
<tr><td>8</td><td>$(1011)_G$</td><td>1</td></tr>
<tr><td>9</td><td>6 including RESET OR 5 excluding RESET.</td><td>1</td></tr>
<tr><td>10</td><td>Sqrt (a*a+b*b).</td><td>1</td></tr>
<tr><td></td><td>Part-B</td><td></td></tr>
<tr><td>11</td><td>
<table>
<tr><th></th><th>FET</th><th>BJT</th></tr>
<tr><td>1</td><td>It is unipolar device</td><td>It is bipolar device</td></tr>
<tr><td>2</td><td>It is voltage controlled device</td><td>It is current controlled device</td></tr>
<tr><td>3</td><td>Input resistance is very high</td><td>Input resistance is very low</td></tr>
<tr><td>4</td><td>It has high switching speed</td><td>It has low switching speed</td></tr>
<tr><td>5</td><td>Less noise</td><td>High noise</td></tr>
<tr><td>6</td><td>Current conduction is due to majority charge carriers</td><td>Current conduction is due to both majority and minority charge carriers</td></tr>
</table>
(any two)
</td><td>2</td></tr>
<tr><td>12</td><td>Remove all ac sources, open all capacitors, short all inductors if any.</td><td>2</td></tr>
<tr><td>13</td><td>
<table>
<tr><th></th><th>Positive feedback</th><th>Negative feedback</th></tr>
<tr><td>1</td><td>Feedback signal is in phase with input signal</td><td>Feedback signal is out of phase with input signal</td></tr>
<tr><td>2</td><td>Used in oscillators</td><td>Used in amplifiers</td></tr>
<tr><td>3</td><td>Gain is high or gain increases</td><td>Gain is low or gain decreases</td></tr>
<tr><td>4</td><td>Frequency band width low</td><td>Frequency band width high</td></tr>
</table>
(any two)
</td><td>2</td></tr>
</table>

14	RC Oscillators do not require inductors, hence size of the circuit and cost are reduced. Provide constant output and good stability.	1 1
15	$I = I_s\left[e^{\frac{qv}{kT}} - 1\right]$ where I_s- reverse saturation current, K-Boltzman constant, I-Current through diode, T-Temperature in Kelvin, q- Charge of electron, V-voltage across diode.	1
16	Duty ratio=T_{on}/T =0.5mS/2mS=0.25 V_{dc} =Duty ratio*V_s=0.25*24=6v	1 1
17	A — Y = $\overline{A+A} = \overline{A}\,\overline{A} = \overline{A}$ NOT function using NOR gates A, B — $\overline{A+B}$ — Y = $\overline{\overline{A+B}}$ = A+B OR function using NOR gates	1 1
18	**Uplink signal** / **Downlink Signal** 1: Signal transmitted from ground station to satellite / Signal transmitted from satellite to ground station on earth 2: Frequency range is 6GHz / Frequency range is 4GHz	1 1
	Part-C	
19	A straight line which joins saturation point and cutoff point on output characteristics of transistor is called DC load line Q point does not shift , Provide excellent stabilization and Provide better amplification (any two points)	1 2
20	$Z_{if} = Z_i(1+A\beta)$ $= 10x10^3 (1 + 100x0.01)$ $=20K\Omega$	1 1 1
21	Source → Transmitter → Channel or Medium → Receiver → Destination Noise source → Channel or Medium **Basic communication system** Brief explanation of each block	1 2

22	 Helicol antenna, Yagi Antenna, Loop Antenna, Microstrip Antenna..... (any two)	2 1
23	 Input and output wave forms	2 1
24		3
25	1) && 2) || 3) !	1 1 1
26	Internet is a network of complex network. Long distance telephone and cable TV systems,To provide LAN connection,In college campus communication. (any two)	1 2
	Part -D	
I 27	i) Voltage across R_2= V_2 = $\left[\frac{R_2}{R_1+R_2}\right]V_{CC}$ = $\left[\frac{5K}{45K+5K}\right]20$ = 2V ii) I_E = $\left[\frac{V_2-V_{BE}}{R_E}\right]=\frac{2-0.7}{1x10^3}=1.3mA$ iii) $Z_{in\ base}$= $\beta r_e'$ = 100x$\left[\frac{26mV}{1.3mA}\right]=2k\,\Omega$ iv) Z_{in} =R_1||R_2||$Z_{in\ base}$ = 45k||5k||2k =..... =1.38kΩ v) Z_o =R_c||R_L =10k||10k = ... =5kΩ	1 1 1 1 1

28

$V_{o1} = \left(\frac{-R_f'}{R_1}\right) V_1$ 1

= ..... = -600mV 1

$V_o = -\left(\frac{R_f}{R_1} V_{o1} + \frac{R_f}{R_2} V_2\right)$ 1

=..... = - 4V (substitution and simplification) 2

29

$f = \frac{1}{2\pi\sqrt{L_T C}}$ where $L_T = L_1 + L_2$ 1

Substituting the value of f and C and simplifying for L_T = 11.25mH 3

$L_2 = L_T - L_1$ = 10.25mH 1

30

i) Carrier frequency = $f_c = 6x10^8/2\pi$ = 95.54MHz. 1

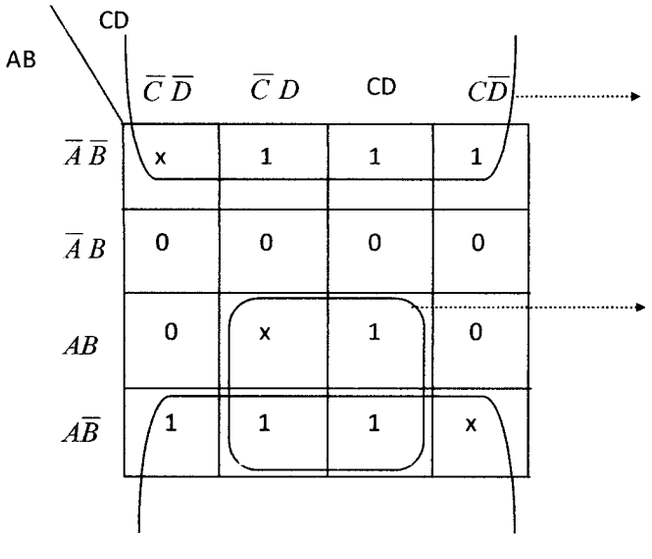
ii) Modulating frequency = $f_m = 1250/2\pi$ = 199Hz. 1

iii) Modulation index = m_f = 5 1

iv) Maximum deviation = $\delta = m_f x f_m$ = 995Hz 1

v) Carrier swing = 2 δ = 1990Hz 1

31



K-Map 1

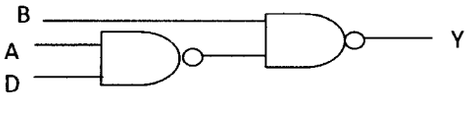
Entering 0s, 1s and x 1

Proper grouping 1

Boolean expression for Y 1

NAND gate equivalent circuit 1

Boolean expression, Y = $\overline{B}$ + AD

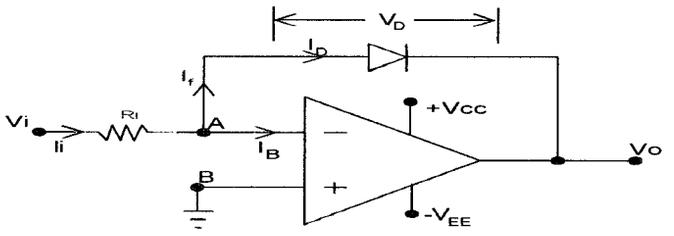
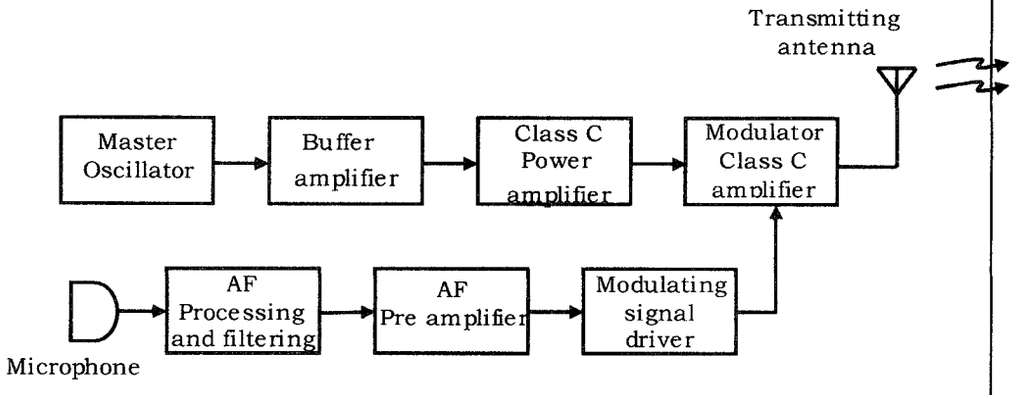
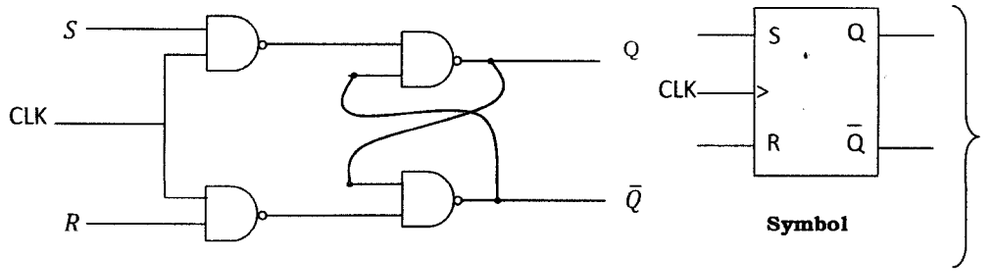


II 32

Comparision of CB, CC and CE amplifiers.

Amplifier parameter	Types of Amplifiers		
	CB	CC	CE
Current gain	Less than 1	Highest(1+β)	High β
Voltage gain	Moderate	Less than 1	High
Power Gain	Moderate	Moderate	Highest
Phase Shift	0°	0°	180°
Input impedance	Low	High	Moderate
Output impedance	High	Low	Moderate
Bandwidth	Wide	Wide	Narrow

(any five) 5

33	A circuit whose output is proportional to logarithm of input.  Derivation..... Final equation $V_o \alpha \log_e(V_i)$	1 1 2 1
34	 Block diagram of high level AM transmitter. Block diagram with labelling Working	 3 2
35	 **Clocked SR flip flop** **Inputs** **Outputs** **Comment** **CLK S R Q_n $\bar{Q}_n$** 1 0 0 Q_{n-1} $\bar{Q}_{n-1}$ HOLD 1 1 0 1 0 SET 1 0 1 0 1 RESET 1 1 1 ? ? INVALID 0 X X Q_{n-1} $\bar{Q}_{n-1}$ HOLD **Truth table** Note: X = any input state Working	1 2 2

36	MOV A, #45H
	MOV R_0, #5EH
	ADD A,R_0
	MOV R_1, A
	45H = 0100 0101
	5EH = 0101 1110
	Content of R_1 = 1010 0011 = A3H
		1
		1
		1
		1
		
		1

37	#include<stdio.h>
	Void main()
	{
	int x,y,z,sum,avg;
	printf("enter the values of x,y,z");
	scanf("%d%d%d", &x,&y,&z);
	sum=(x+y+z);
	avg= sum/3.0;
	printf("sum =%2d", sum);
	printf("avg = %2d", avg);
	}
	
	Enter the values of x=5, y=6, z=7
	sum = 18 avg=6
		
		1
		
		1
		
		1
		
		1
		
		1

	- END-	