University of Mumbai

Examination 2020 under cluster 5(Lead College: APSIT)

Examinations Commencing from 23rd December 2020 to 6th January 2021 and from 7th January 2021 to 20th January 2021

Program: Electronics and Telecommunication Engineering

Curriculum Scheme: Rev 2019

Examination: SE, Semester: III

Course Code: ECC302 and Course Name: Electronic Devices and Circuits

Time: 2 Hour Max. Marks: 80

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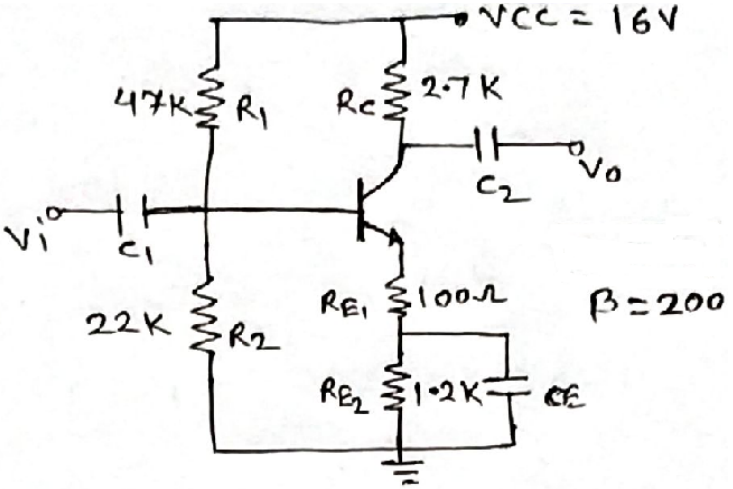
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	Cut in voltage for Si and Ge diode is _____ respectively
Option A:	0.7 V and 0.3 V
Option B:	0.3 V and 0.7 V
Option C:	0.5 V and 0.3 V
Option D:	0.7 V and 0.5 V
2.	In forward bias diode current increases _____
Option A:	linearly
Option B:	exponentially
Option C:	parabolic
Option D:	hyperbolic
3.	In reverse bias current suddenly increase after _____
Option A:	breakdown
Option B:	breakover
Option C:	cut in
Option D:	cut out
4.	If temperature increases VI characteristics sifts to _____ and if decreases it shifts to _____
Option A:	left, right
Option B:	right, left
Option C:	left, remains constant
Option D:	right, remains constant
5.	For Zener diode as a voltage regulator , line regulation means _____
Option A:	fixed input voltage and fixed load resistor
Option B:	variable input voltage and variable load resistor
Option C:	fixed input voltage and variable load resistor
Option D:	variable input voltage and fixed load resistor

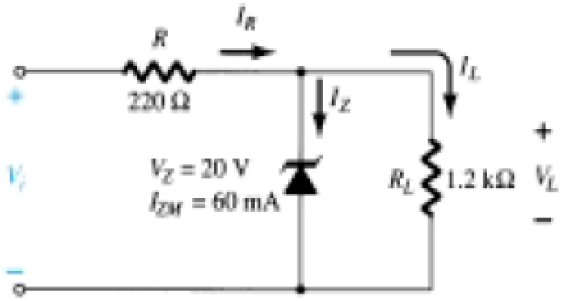
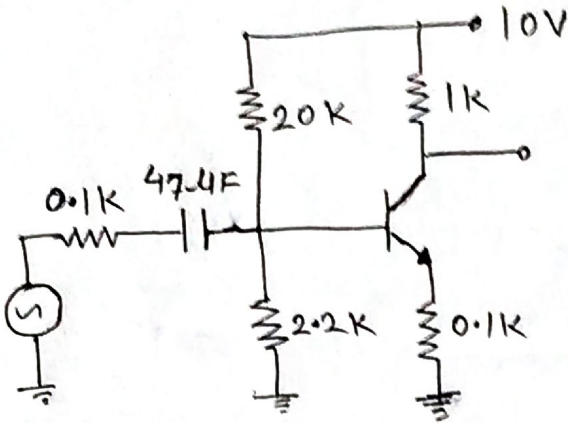
6.	The value of thermal voltage Vt at room temprature T=300K is calculated by _____ and it is _____.
Option A:	KT/q, 26mV
Option B:	KT/q, 28mV
Option C:	q/KT, 26mV
Option D:	q/KT, 28mV
7.	A silicon pn junction at T = 300 K has a reverse saturation current of IS = 2 × 10exp−14 A. Determine the required forward-bias voltage to produce a current of ID = 1 mA.
Option A:	641V
Option B:	6.41V
Option C:	64.1V
Option D:	0.641V
8.	A transistor with β = 120 is biased to operate at a dc collector current of 1.2 mA. Find the value of rπ.
Option A:	625 ohm
Option B:	1250 ohm
Option C:	2500 ohm
Option D:	5000 ohm
9.	The phase difference between the output and input voltages of a CE amplifier is
Option A:	180°
Option B:	0°
Option C:	90°
Option D:	270°
10.	When a transistor amplifier is operating, the current in any branch is _____
Option A:	Sum of AC and DC
Option B:	AC only
Option C:	DC only
Option D:	Difference of AC and DC
11.	The point of intersection of d.c. and a.c. load lines is called ……..
Option A:	Saturation point
Option B:	Cut off point
Option C:	Operating point
Option D:	Critical point
12.	To amplify low frequency signal, _____is used in multistage amplifiers.

Option A:	RC coupling
Option B:	transformer coupling
Option C:	impedance coupling
Option D:	direct coupling
13.	Which of the following is the fastest switching device?
Option A:	MOSFET
Option B:	Triode
Option C:	JFET
Option D:	BJT
14.	Before the invention of power amplifiers for the amplification of audio signals generally device was used
Option A:	Diode
Option B:	OPAMP
Option C:	Vacuum tubes
Option D:	SCR
15.	Power amplifier directly amplifies _____
Option A:	Voltage of signal but not Current
Option B:	Current of the signal but not Voltage
Option C:	Power of the signal but not Voltage and Current
Option D:	Voltage, Current and Power of the signal
16.	In a multistage amplifier, generally the output stage is also called ……
Option A:	Mixer stage
Option B:	Power stage
Option C:	Detector stage
Option D:	Amplifier stage
17.	The maximum efficiency of resistance loaded class A power amplifier is ……..
Option A:	5 %
Option B:	50 %
Option C:	30 %
Option D:	25 %
18.	The Maximum and minimum output of the Differential amplifiers is defined as:
Option A:	Vmax = V_{DD}, Vmin = -V_{DD}
Option B:	Vmax = V_{DD}, Vmin = R_D x Iss
Option C:	Vmax = V_{DD}, Vmin = V_{DD} – R_D x Iss
Option D:	Vmax = -V_{DD}, Vmin = -V_{DD}

19.	In Common Mode Differential Amplifier, the outputs $Vout_1$ and $Vout_2$ are related as:
Option A:	$Vout_2$ is in out of phase with $Vout_1$ with same amplitude.
Option B:	$Vout_2$ and $Vout_1$ have same amplitude but the phase difference is 90 degrees
Option C:	$Vout_1$ and $Vout_2$ have same amplitude and are in phase with each other and their respective inputs.
Option D:	$Vout_1$ and $Vout_2$ have same amplitude and are in phase with each other but out of phase with their respective inputs.
20.	If output is measured between two collectors of transistors, then the Differential amplifier with two input signal is said to be configured as
Option A:	Dual Input Balanced Output
Option B:	Dual Input Unbalanced Output
Option C:	Single Input Balanced Output
Option D:	Single Input Unbalanced Output

Q2.	**Solve any Two Questions out of Three 10 marks each**
A	Determine the following for the network given below Fig. 1 Voltage gain, Current gain, input impedance and output impedance  Fig. 1
B	With neat diagram derive the efficiency of transformer coupled class –A power amplifier? State its uses.
C	Explain construction and working of n-channel E-MOSFET with output characteristics

Q3.	
A	**Solve any Two 5 marks each**
i.	Compare BJT and JFET
ii.	Explain working of pn junction diode with the help of VI characteristics.

iii.	Determine the range of values of Vi that will maintain the Zener diode of Fig. 2 in the "on" state.  Fig. 2
B	**Solve any One 10 marks each**
i.	For the circuit shown in Fig. 3, the transistor parameter are V_{BE} (on) = 0.7 V, β = 200, VA = ∞, i. Derive the expression for lower cutoff frequency due to input coupling capacitor. ii. Determine lower cut-off frequency and voltage gain  Fig. 3
ii.	Explain the MOS differential pair amplifier with a common-mode input voltage v_{CM}.

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Question Number	Correct Option (Enter either 'A' or 'B' or 'C' or 'D')
Q1.	A
Q2.	B
Q3.	A
Q4	A
Q5	D
Q6	A
Q7	D
Q8.	C
Q9.	A
Q10.	A
Q11.	C
Q12.	D
Q13.	A
Q14.	C
Q15.	D
Q16.	B
Q17.	D
Q18.	C
Q19.	D
Q20.	A