

**Program: BE Electronics and Telecommunication Engineering**

**Curriculum Scheme: Revised 2012**

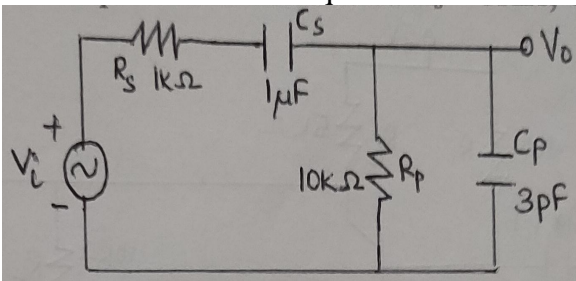
**Examination: Second Year Semester IV**

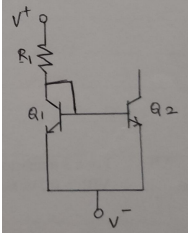
**Course Code: ETC402 Course Name: Analog Electronics-II**

**Time: 1 hour Max. Marks: 50**

=====

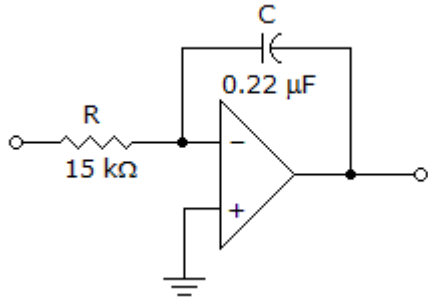
**Note: All the questions are compulsory and carry equal marks.**

Q.1	Determine the corner frequencies for the circuit 
Option A:	58.3 MHz
Option B:	45.2 MHz
Option C:	69 MHz
Option D:	52MHz
Q.2	Determine the unity gain BW of an FET. Consider an n-channel MOSFET with parameters: $K_n=0.25 \text{ mA/V}^2$ , $V_G=1\text{V}$ , $\lambda=0$ , $C_{gd}=0.04\text{pF}$ , $C_{gs}=0.2\text{pF}$ . Assume transistor is biased at $V_{gs}=3\text{V}$ .
Option A:	778MHz
Option B:	663MHz
Option C:	743MHz
Option D:	535MHz
Q.3	Determine the quiescent collector current and collector to emitter voltage for common mode voltages: $V_{B1}=V_{B2}=V_{cm}=5\text{V}$ .
Option A:	5V
Option B:	4.3V
Option C:	0.7V
Option D:	3V
Q.4	The differential gain of dual input single output BJT differential amplifier pair is not dependant on:
Option A:	Emitter resistance
Option B:	Collector resistance

Option C:	Quiescent current
Option D:	Threshold voltage
Q.5	The relation between $I_{ref}$ and output current in an improved 3 transistor current source is:
Option A:	Directly proportional
Option B:	Inversely proportional
Option C:	Not related
Option D:	None of these
Q.6	For the circuit shown below, determine $I_{ref}$ and $I_o$ . Given: $V^+ = 10V$ , $V^- = 0V$ , $R_1 = 15 K\Omega$ , $V_{BE(on)} = 0.7V$ , $\beta = 755$ , $V_a = \infty$ .
	 <p>The diagram shows a current source circuit. A resistor <math>R_1</math> is connected between the positive supply <math>V^+</math> and the base of transistor <math>Q_1</math>. The emitter of <math>Q_1</math> is connected to the negative supply <math>V^-</math>. The base of <math>Q_2</math> is connected to the collector of <math>Q_1</math>. The emitter of <math>Q_2</math> is also connected to <math>V^-</math>. The collector of <math>Q_2</math> is connected to <math>V^+</math>. The output current <math>I_o</math> is the current flowing out of the collector of <math>Q_2</math>.</p>
Option A:	5.6Ma
Option B:	3Ma
Option C:	1.2mA
Option D:	0.6Ma
Q.7	For a Zener diode to operate as a voltage regulator, it should operate in:
Option A:	Reverse Bias
Option B:	Forward Bias
Option C:	Active Bias
Option D:	It cannot be used as a voltage regulator
Q.8	The value of alpha of a transistor is 0.996. Beta value of the transistor will be
Option A:	200
Option B:	299
Option C:	150
Option D:	249
Q.9	For a JFET self bias circuit, if the source resistance is increased keeping all other parameters constant, what is the effect on the operating point?
Option A:	Can't change Source resistance
Option B:	Remains same
Option C:	It moves towards $I_D = I_{DSS}$ , $V_{GS} = 0$
Option D:	It moves towards $I_D = 0$ , $V_{GS} = V_P$

Q.10	
Option A:	92 mV
Option B:	128 mV
Option C:	100 mV
Option D:	124.6 mV
Q.11	A Differential Amplifier should have collector resistor's value ( $R_{C1}$ & $R_{C2}$ ) as
Option A:	5kΩ, 5kΩ
Option B:	5Ω, 10kΩ
Option C:	5Ω, 5kΩ
Option D:	5kΩ, 10kΩ
Q.12	A Differential Amplifier amplifies
Option A:	Input signal with higher voltage
Option B:	Input voltage with smaller voltage
Option C:	Sum of the input voltage
Option D:	Difference between two signals
Q.13	Find $I_C$ , given $V_{CE}=0.77v$ , $V_{CC}=10v$ , $V_{BE}=0.37v$ and $R_C=2.4k\Omega$ in Dual Input Balanced Output differential amplifier
Option A:	0.4mA
Option B:	0.4A
Option C:	4mA
Option D:	4A
Q.14	What is the main factor governing the maximum power rating ( $P_{TOT}$ ) of a transistor?
Option A:	The maximum collector voltage.
Option B:	The temperature of the base/emitter junction.
Option C:	The maximum collector current.
Option D:	The temperature of the base/collector junction.
Q.15	Which of the following amplifier classes has a maximum theoretical efficiency of between 70 and 80%?
Option A:	Class A

Option B:	Class AB
Option C:	Class B
Option D:	Class D
Q.16	A silicon power transistor is operated with a heat sink ( $\theta_{SA} = 1.5^\circ\text{C/W}$ ). The transistor, rated at 150 W (25°C), has $\theta_{JC} = 0.5^\circ\text{C/W}$ , and the mounting insulation has $\theta_{CS} = 0.6^\circ\text{C/W}$ . What is the maximum power that can be dissipated if the ambient temperature is 50°C and $T_{Jmax} = 200^\circ\text{C}$ ?
Option A:	61.5W
Option B:	60W
Option C:	57.7W
Option D:	55.5W
Q.17	What is the ratio of the secondary voltage to the primary voltage with the turn ratio in the windings?
Option A:	$N_2/N_1$
Option B:	$(N_1/N_2)^2$
Option C:	$(N_1/N_2)^{1/3}$
Option D:	$N_1 \times N_2$
Q.18	Which of the following properties should an ideal op amp have?
Option A:	Infinitely wide bandwidth, infinitely high output impedance and perfect linearity
Option B:	High DC gain, low input reactance and perfect linearity
Option C:	Infinitely high input impedance, perfect linearity and zero noise.
Option D:	Infinitely high gain, perfect linearity and zero input impedance.
Q.19	The open-loop voltage gain ( $A_{ol}$ ) of an op-amp is the
Option A:	external voltage gain the device is capable of
Option B:	internal voltage gain the device is capable of
Option C:	most controlled parameter
Option D:	same as $A_{cl}$
Q.20	The difference between the input and output voltage are -1v and 17v. Calculate the closed loop voltage gain of differential amplifier with one op-amp?
Option A:	-51
Option B:	34
Option C:	-17
Option D:	14
Q.21	What will be the overall gain in Darlington circuit, if the individual transistor gain is 200?
Option A:	10000
Option B:	40000

Option C:	8000
Option D:	1000
Q.22	A widlar current source is used
Option A:	to get low value of current
Option B:	to get high value of CMRR
Option C:	to get low voltage of gain
Option D:	to get high value of Output
Q.23	Refer to the given figure. A square-wave input is applied to this amplifier. The output voltage is most likely to be 
Option A:	a triangle wave.
Option B:	a triangle wave.
Option C:	a sine wave.
Option D:	no output.
Q.24	The output of a Schmitt trigger is a
Option A:	pulse waveform.
Option B:	sawtooth waveform.
Option C:	sinusoidal waveform.
Option D:	triangle waveform.
Q.25	As the junction temperature increases, the voltage breakdown point for Zener mechanism .....
Option A:	Is increased
Option B:	Is decreased
Option C:	Remains the same
Option D:	None of the above