University of Mumbai

Examination June 2021

Examinations Commencing from 15th June 2021 to 26th June 2021

Program: **Bachelor of Engineering**

Curriculum Scheme: **Electronics & Telecommunication (Rev2019 'C' Scheme)**

Examination: **DSE** Semester **III**

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

Time: 2 hour Max. Marks: 80

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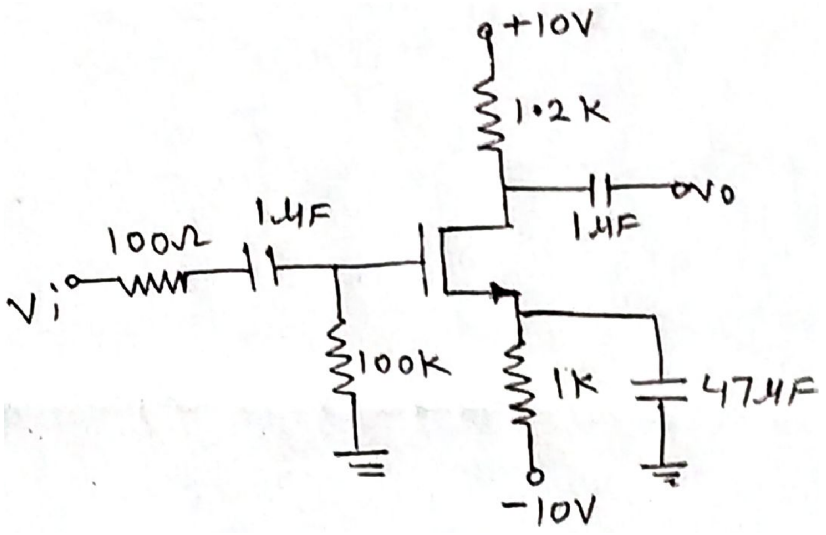
Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	In AC load line, slope is generally
Option A:	Greater than slope of DC load line
Option B:	Less than slope of DC load line
Option C:	Same as that of DC load line
Option D:	Greater than as well as less than slope of DC load line
2.	In AC load line ,the slope is represented by an equation is
Option A:	Y = -1 / Rac
Option B:	Y = 1 / Rac
Option C:	Y = -1 / RL
Option D:	Y = 1 / RL
3.	A transistor with $\beta = 120$ is biased to operate at a dc collector current of 1.2 mA. Find the value of $r\pi$.
Option A:	2.2 KΩ
Option B:	2.35 KΩ
Option C:	2.5 KΩ
Option D:	2.45 KΩ
4.	The SI units of transconductance is
Option A:	Volt/ Ampere
Option B:	Ohm
Option C:	Siemens
Option D:	Ampere/ Volt
5.	The enhancement MOSFET is
Option A:	Normally open MOSFET
Option B:	Useful as a very good constant voltage source
Option C:	Widely used because of easy in its fabrication
Option D:	Normally close MOSFET
6.	A CS amplifier has a voltage gain of
Option A:	$g_m (r_d \| \| R_D)$
Option B:	$g_m r_d$

Option C:	gm Rs
Option D:	gm rs / (1+gm rs)
7.	For which of the following frequency region(s) can the coupling and bypass capacitors no longer be replaced by the short-circuit approximation?
Option A:	Low-frequency
Option B:	Mid-frequency
Option C:	High-frequency
Option D:	All frequency
8.	What is the normalized gain expressed in dB for the cut-off frequencies?
Option A:	–3 dB
Option B:	+3 dB
Option C:	–6 dB
Option D:	–20 dB
9.	The larger capacitive elements of the design will determine the _____ frequency.
Option A:	Lower cut off
Option B:	Middle
Option C:	Higher cut off
Option D:	Intermediate
10.	What is the ratio of the capacitive reactance XCS to the input resistance Ri of the input RC circuit of a single-stage BJT amplifier at the low-frequency cut-off?
Option A:	0.25
Option B:	0.50
Option C:	0.75
Option D:	1.0
11.	Which of the lower cutoff -frequency determined by Cin, Cout, and CE will be the predominant factor in determining the low-frequency response for the complete system?
Option A:	Lowest
Option B:	Middle
Option C:	Highest
Option D:	Average
12.	Which of the following elements is (are) important in determining the gain of the system in the high-frequency region?
Option A:	Coupling capacitances
Option B:	Bypass capacitances
Option C:	Transconductance
Option D:	Inter-electrode, wiring and miller effect capacitances
13.	In a multistage amplifier, the overall frequency response is determined by the
Option A:	Frequency response of each stage depending on the relationships of the critical frequencies.
Option B:	Frequency response of the first amplifier.

Option C:	Frequency response of the last amplifier.
Option D:	Lower critical frequency of the first amplifier and the upper critical frequency of the final amplifier.
14.	In the mid frequency region, coupling capacitor acts as a _____ circuits and stray capacitance acts as a _____ circuits.
Option A:	Open, Short
Option B:	Short, Open
Option C:	Short, Short
Option D:	Open, Open
15.	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 the input voltage
16.	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
17.	To increase the value of CMRR, which circuit is used to replace the emitter resistance R_E in differential amplifiers?
Option A:	Constant current bias
Option B:	Resistor in parallel with R_E
Option C:	Resistor in series with R_E
Option D:	Diode in parallel with R_E
18.	The input stage of an op amp is usually a
Option A:	Swamped amplifier
Option B:	Class B push-pull amplifier
Option C:	CE amplifier
Option D:	Differential amplifier
19.	Class _____ power amplifier has highest collector efficiency
Option A:	A
Option B:	B
Option C:	C
Option D:	AB
20.	The maximum efficiency of transformer coupled class A power amplifier is _____
Option A:	78.5 %
Option B:	50%
Option C:	30%
Option D:	25%

Q2	**Solve any Two Questions out of Three** **10 marks each**
A	Explain the concept of multistage amplifier with advantage, disadvantage and application.
B	For the circuit shown in Fig. 1, Transistor parameters are Kn = 1 mA/V^2, Vtn = 0.7 V, Cgs = 2 pF, Cgd = 0.2 pF, λ = 0, find the mid band voltage gain, miller capacitance and upper cut-off frequency.  Fig.1
C	Draw a small signal equivalent structure of Diff-amp and derive the equation for its CMRR.

Q3.	**Solve any Two Questions out of Three** **10 marks each**
A	Derive the equation of Av, Zi and Zo of CE amplifier using un-bypass R_E.
B	Explain the effects of coupling, bypass capacitor and parasitic capacitor on frequency response of single stage amplifier.
C	Draw a neat diagram of a transformer coupled Class A power amplifier and explain its working, hence find its efficiency.

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