Model Question Paper-I with effect from 2023-24 (CBCS Scheme)

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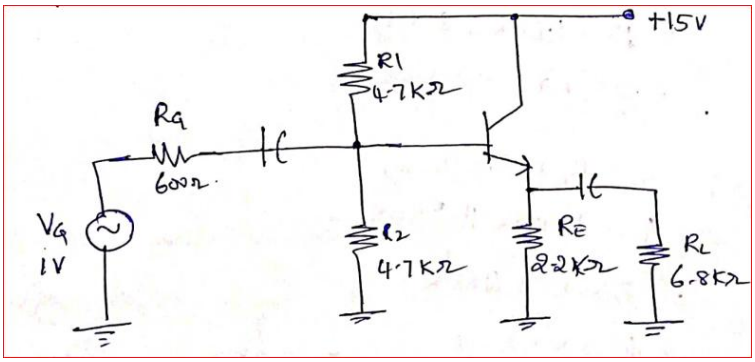
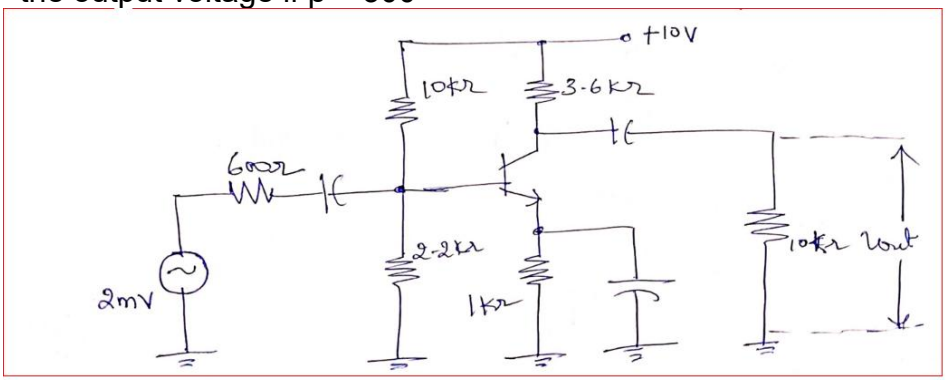
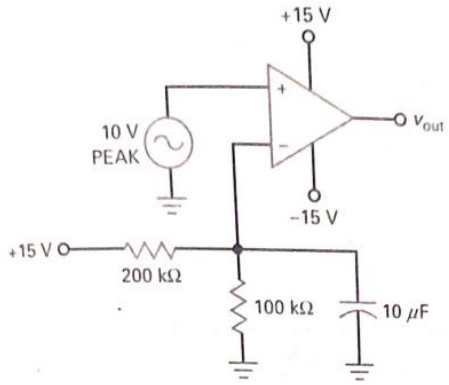
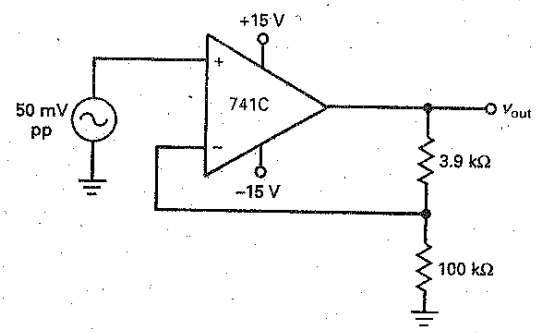
Third Semester B.E. Degree Examination
Electronic Principles and circuits

TIME: 03 Hours **Max. Marks: 100**

Note: 01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

Q.No	Question	Marks	Bloom's Level
	MODULE-1		
1	a. Develop an expression for the operating point I_C and V_{CE} for the voltage divider bias circuit using approximate analysis. Also Calculate the operation point for the VDB circuit given Vcc=10V, R1=10KΩ, R2= 2.2KΩ, Rc= 3.6KΩ, RE= 1KΩ	**10**	**L3**
	b. For the circuit shown in Fig 1b, determine the voltage gain and ac load voltage if β = 150  **Fig 1b**	**10**	**L3**
	OR		
2	a. Design the voltage divider bias circuit to meet the following specifications Vcc=10V, V_{CE} at mid point, stiff voltage divider, collector current 1mA, βdc = 70 -200	**10**	**L3**
	b. For the circuit shown below in Fig 2b, the ac generator has an internal resistance of 600Ω for a voltage divider circuit. Determine the output voltage if β = 300  Fig 2b	**10**	**L3**
	MODULE-2		
3	a. With neat circuit diagrams, explain biasing of MOSFET by fixing the	**10**	**L3**

	gate voltage		
	b. With neat circuit diagram, develop an expression for voltage gain, input impedance and output impedance for common gate amplifier.	**10**	**L3**
	OR		
4	a. Develop an expression for drain to source voltage for a MOSFET amplifier using drain to gate feedback resistor.	**10**	**L3**
	b. Develop an expression for transconductance in terms of drain current and overdrive voltage.	**4**	**L3**
	c. With neat circuit diagram, develop an expression for voltage gain, input impedance and output impedance for common source amplifier without source resistance.	**6**	**L3**
	MODULE-3		
5	a. With neat circuit diagram, explain the operation of R-2R DAC	**7**	**L2**
	b. For the circuit shown in Fig 5b, the input voltage is a sine wave with peak value of 10V. Determine the trip point. Also plot the input output waveform  Fig 5b	**7**	**L3**
	c. With neat circuit diagram, explain the operation of Schmitt trigger.	**6**	**L2**
	OR		
6	a. With neat circuit diagram, internal diagram of 555 timer and waveforms explain the operation of astable multivibrator.	**10**	**L3**
	b. With neat circuit diagram, explain the operation of wein bridge oscillator	**10**	**L3**
	MODULE-4		
7	a. Classify negative feedback amplifiers and explain each with neat block diagram.	**10**	**L3**
	b. Calculate the feedback fraction, ideal closed loop gain, percentage error and exact closed loop voltage gain. Use AOL = 100,000 for 741C 	**5**	**L3**
	c. With neat circuit diagram and expressions, explain current amplifiers.	**5**	**L3**
	OR		
8	a. Classify the filters and explain the ideal response for each of the	**10**	**L3**

	filters.		
	b. With neat circuit diagrams, explain the operation of first order low pass filter and high pass filter	**10**	**L3**
	MODULE-5		
9	a. With neat circuit diagram and waveform explain SCR phase control using RC circuit	**10**	**L3**
	b. With neat circuit diagram, explain the operation of UJT and hence explain how it is used as relaxation oscillator.	**10**	**L3**
	OR		
10	Make use of break over characteristics to explain the operation of 4 layer diode	**10**	**L3**
	Write short notes on IGBT	**5**	**L3**
	Explain bi-directional thyristors in brief.	**5**	**L3**