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S.E. (Electronics & TC / Electronics & Comm Engg) (Sem-IV)
 (Revised Course 2016-2017) EXAMINATION Nov/Dec 2019
 Electronic Devices and Circuits - II

[Duration : Three Hours]

[Total Marks : 100]

Instructions:

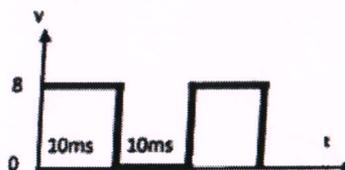
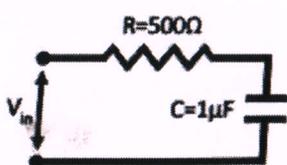
- (i) Answer Any Five questions by selecting **Two** questions from **Part-A**, **Two** question from **Part-B** and **One** question from **Part-C**.
- (ii) Assume missing data if any with proper justification.
- (iii) Notations used have usual meaning.
- (iv) Illustrate with neat circuit diagrams/ Characteristics where appropriate.
- (v) Figures to the right indicate full marks.

PART A

1. Answer **any TWO** questions from the following:

- a) With the help of suitable mathematical an analysis and a neat schematic derive an expression for the following configurations 8
 - (i) Output impedance with feedback for current series feedback
 - (ii) Input impedance with feedback for a Voltage Shunt feedback.
- b) Determine the voltage gain, input and output impedance with feedback for a voltage series with negative feedback having $A = -110$, $R_i = 10k\Omega$, $R_o = 25k\Omega$ for a feedback of; 6
 - (i) $\beta = -0.2$ (ii) $\beta = -0.6$
- c) With the help of a neat diagram, explain the operation of Wein Bridge Oscillator. List its merits and demerits 6

- 2. a) Design an Astable Multivibrator using BJT to generate a square wave of 2 KHz having a duty cycle of 70%. Given : $V_{cc} = 12V$, $I_c = 6mA$. Assume $h_{fe} = 40$. Draw the designed circuit. 8
- b) For the circuit and the input depicted in the figure below, find the output voltage level after 5ms and 25ms 6

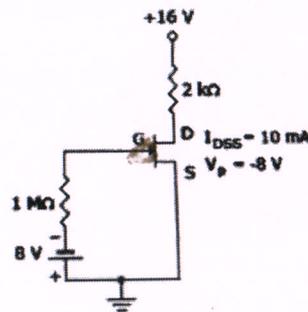


3. c) With the help of suitable circuits and waveforms, illustrate the operation of a monostable multivibrator 6
- a) With suitable mathematical analysis, show the effect that a negative feedback has on input and output impedance in a voltage series configuration 8
- b) With respect to a BJT Schmitt Trigger circuit, answer the following; 6
- (i) Using suitable waveforms, illustrate the response for a Sine wave and a triangular wave input.
- (ii) Draw a Hysteresis Curve
- (iii) Explain the significance of UTP and LTP
- c) With the help of a neat circuit diagram, explain the operation of a 3 stage RC phase shift oscillator using BJT. Calculate the frequency of oscillation if $R_1 = R_2 = R_3 = 200k\ \Omega$ and $C_1 = C_2 = C_3 = 400pF$. 6

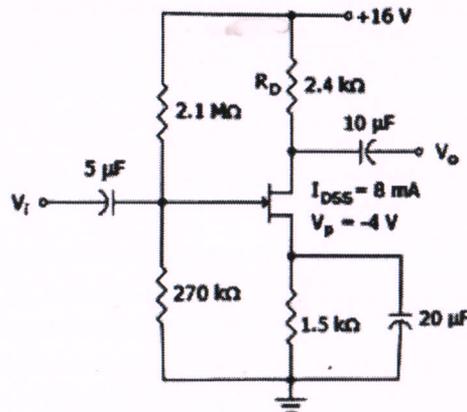
PART B

Answer any TWO question from the following:

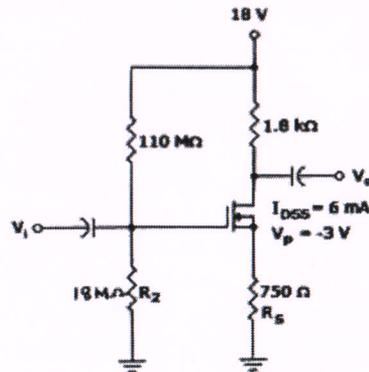
4. a) With the help of circuit diagrams, explain the mathematical approach towards the analysis of JFET fixed bias configuration. 6
- b) For the circuit shown in figure below, Calculate the value of V_D , I_{DQ} , V_{DS} and V_{GSQ} . 7



- c) For the circuit shown in figure below, Calculate the value of V_G , I_D , V_s and V_{GS} . 7



5. a) For the circuit shown figure below, Calculate the value of V_G , I_D , V_{DS} , and V_{GS} . 7



- b) With help of neat diagram explain the working of Transmissive type field effect LCD. 6

- c) Explain, step by step how a CRO can be used to measure frequency and phase in electrical systems? Explain how oscilloscope can be used to measure current in an electric circuit. 7

6. a) Explain the application of UJT as sampling gate. 5

- b) Draw the schematic diagram, characteristics and applications of
 (i) SCS
 (ii) GTO
 (iii) Light activated SCR

5x3=15

PART C

Answer **any ONE** questions from the following:

7. a) With suitable mathematical expressions and waveforms, explain how can Pulse width and RC Time constant affect the working of a RC Differentiator circuit? What is the ideal design for a Differentiator. 6

- b) Write a short note on Junction and Diffusion Capacitance. 6
- c) Sketch the four basic topologies used in feedback amplifiers. State the value of feedback factor β in each case. 8
8. a) Explain the working of Sample and Hold circuit with the help of neat circuit diagrams. 6
- b) Draw the schematic block diagram and explain the working of UPS. 8
- c) List out the differences between Photodiode and Photoconductive cells. 6