

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third Semester B.Tech (Minor) Degree Examination December 2022 (2021 admn.)

Course Code: ECT281**Course Name: ELECTRONIC CIRCUITS**

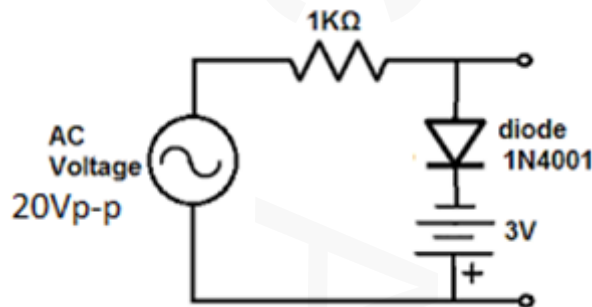
Max. Marks: 100

Duration: 3 Hours

PART A**Answer all questions. Each question carries 3 marks**

Marks

- 1 Draw the output waveform of the following circuit, assuming voltage drop across the diode is 0.6V. (3)



- 2 Explain the need for biasing transistors. What is the advantage of potential divider biasing compared to fixed biasing? (3)
- 3 Distinguish between enhancement type and depletion type MOSFET. (3)
- 4 A multistage amplifier consists of three stages. The voltage gain of the stages are 30, 50 & 80. Calculate the overall gain in dB. (3)
- 5 Draw and explain the working of SMPS with block diagram. (3)
- 6 State & explain Barkhausen criteria. (3)
- 7 Explain the terms CMRR and Slew Rate of an OPAMP. Also specify the typical values for IC 741. (3)
- 8 Draw and explain the transfer characteristics of a Schmitt trigger. (3)
- 9 The resolution of a 4-bit counting ADC is 0.5V. For an analog input of 6.6V What will be the digital output? (3)
- 10 With the help of necessary figures, explain the working of a 2-bit flash ADC. (3)

PART B

Answer any one full question from each module. Each question carries 14 marks

Module 1

- 11 a) Draw the circuit of a double clipper (shunt) and explain its working with appropriate waveforms. (6)
- b) Draw and explain the circuit of a RC differentiator and write its design equation. Also draw its output waveform for a 1KHz square wave input. (8)

OR

- 12 a) Give a detailed account on the different types of clamping circuits. (9)
- b) What is the significance of bias stabilization of a transistor? (5)

Module 2

- 13 a) With the help of a circuit diagram explain the working of RC coupled amplifier. (8)
- b) Draw and explain the frequency response of RC coupled amplifier. (6)

OR

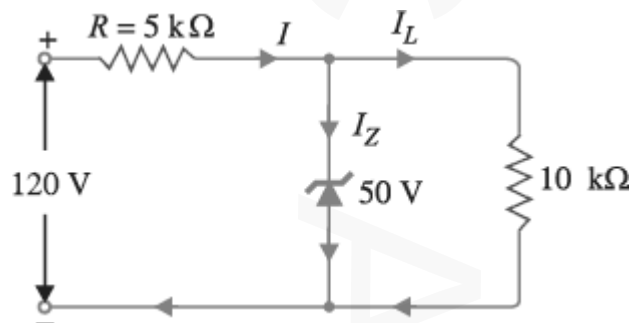
- 14 With neat sketches explain the construction, principle of operation & characteristics of an n-channel enhancement MOSFET. (14)

Module 3

- 15 a) With a neat diagram explain the working of Hartley oscillator using BJT. (8)
- b) Explain how a Zener diode acts as a voltage regulator. (6)

OR

- 16 a) For the circuit shown in Figure: 1, find: (i) the output voltage (ii) the voltage drop across series resistance (iii) the current through Zener diode. (6)



- b) Explain the working of a simple series voltage regulator using transistor. (8)

Module 4

- 17 a) Draw and explain the circuit of a subtractor and summing amplifier using OPAMPs. (9)
- b) Realise $Y(t) = -2V_1 + 3V_2 + 4V_3$ using an operational amplifier where V_1 , V_2 and V_3 are input voltages. (5)

OR

- 18 a) With necessary figures explain the concept of 'Virtual Ground' of an Op amp. (4)
- b) Draw and explain the circuit of a triangular wave generator using Op amp with necessary waveforms. Also show that the same circuit can be modified to generate a sawtooth waveform. (10)

Module 5

- 19 a) With a neat diagram explain the working of IC 555 timer. (4)
- b) Explain in detail a 3-bit R-2R ladder type DAC. A 4-bit R-2R ladder type DAC having $R=10K\Omega$ and $V_R=1V$. Find its resolution and output voltage for an input 1101. (10)

OR

- 20 a) Design an astable multivibrator using 555 timer to generate a waveform of 1KHz, with 60% duty cycle. Assume $C = 0.1\mu F$ (7)
- b) Draw the circuit of Sample and Hold circuit and explain the necessity of this circuit in ADC. (7)
