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SARDAR PATEL UNIVERSITY

B.Sc. VI Semester

Course Code: US06CELE21

Discrete and Linear circuits

Monday, Date: 4/4/2022, Time: 3:00 to 5:00 pm

TOTAL MARKS 70

Q. 1 Multiple Choice Questions: 10

1. In order to use Op-Amp as an integrator, capacitor is connected in
   (i) feedback loop
   (ii) output
   (iii) input
   (iv) none of the above
2. In order to prevent cross over distortion in output stage of OP Amp, Pushpull amplifier is used in
   (i) Class A mode
   (ii) Class B mode
   (iii) Class AB mode
   (iv) Class C mode
3. A comparator circuit has two inputs
   (i) whose values are always equal
   (ii) whose values are always different
   (iii) whose one input is fixed and other is varying
   (iv) whose value are always complimentary
4. For rectification -------- is used
   (i) transistor
   (ii) diode
   (iii) capacitor
   (iv) inductor
5. What part of characteristics curve of a diode is useful for log amplifier?
   (i) log region above 0.7 V
   (ii) log region between 0 V and 0.7 V
   (iii) log region below 0.7 V
   (iv) log region between 0.7 and 1.4 V
6. Which circuit cut off the voltages above or below certain level?
   (i) Clamper
   (ii) Clipper
   (iii) VCO
   (iv) Modulator
7. Voltage controlled oscillator is also called ----------convertor.
   (i) Voltage to frequency
   (ii) Frequency to voltage
   (iii) Temperature to voltage
   (iv) Current to voltage
8. PAM carrier signal is a square wave or pulses whose ---------- is varied by modulating signal input.
   (i) frequency
   (ii) amplitude
   (iii) width
   (iv) Time period
9. ---------- converts any irregular shaped waveform into pulses.
   (i) VCO
   (ii) Astable multivibrator

(P.T.O.)

(iii) Schmitt Trigger
(iv) Monostable multivibrator

10. IC 555 timer operates in the temperature range
(i) -55 C to 125 C
(ii) 55 C to 125 C
(iii) 0 C to 125 C
(iv) -55 C to -125 C

Q2: True or False 8

1. For ideal Op Amp CMRR should be Infinite.
2. Passive filter has gain less than unity.
3. The cut in voltage for Ge diode is 0.7 V.
4. Monostable multivibrator is also called free running multivibrator.
5. The circuit which adds dc voltage to the ac input signal is called clamper.
6. The process known as signal compression is used with a Log amplifier.
7. Timer 555 is an analog IC used to produce delay of few microseconds to few minutes.
8. When VCO frequency and input signal frequency becomes equal than the PLL is said to be locked.

Q3: Answer any 10 questions out of 12 questions briefly. 20

1. Why Op-Amp is known as Operational Amplifier?
2. Which circuit is used in Input stage and Output stage of Op-Amp?
3. List dc parameters of Op-amp.
4. What are limitations of PN junction diode?
5. What is peak detector circuit used for?
6. Define Acquisition time.
7. Combination of which two circuits is used to produce PWM signal?
8. What is expression for forward current of diode?
9. Draw waveforms of Pulse Amplitude modulation.
10. Draw the pin diagram of 555 timer and label each pin?
11. Draw the circuit of Water level controller using 555 timer?
12. State the types of multivibrator. Define any one multivibrator.

Q4: Answer any 4 questions out of 8 questions elaborately. 32

1. Draw block diagram of Op-Amp and discuss about each block.
2. Explain any two applications of inverting mode of Op-Amp.
3. Write short note on Sample and Hold circuit.
4. Obtain expression for total time period T for Monostable multivibrator.
5. Explain working of Analog voltage multiplier.
6. Explain basic logarithmic amplifier and state its disadvantages.
7. Draw functional block digram of 555 Timer and explain working of each block.
8. Explain how Astable multivibrator can be used for square wave generator and VCO.

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