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SARDAR PATEL UNIVERSITY V.V.NAGAR

B.Sc.(III[rd] SEM.) INSTRUMENTATION (V)

30[th] NOVEMBER-2019 EXAMINATION-(NC)

SUBJECT- ELECTRONICS CIRCUIT AND OPTICAL DEVICE-1

SUB.CODE-US03CINV02

TIME: 2:00 pm to 5:00 pm **MARKS-70**

Q-1 **Choose correct answer.** [10]

1. ____ is also called free running oscillator.
   (A) Pulse width modulation (C) mono stable multivibrator
   (B) zero crossing detector (D) None of above
2. The maximum input offset voltage for IC741 is___.
   (A) 6.6 mv (C) 7 mv
   (B) 5 mv (D) 6 mv
3. _____ gives the triangular output when input is square wave.
   (A) Adding integrator (C) Differentiator
   (B) Comparator (D) None of above
4. The voltage gain in passive filter is always ___.
   (A) unity (C) greater than unity
   (B) zero (D) None of above
5. In band pass filter _____ frequency is eliminated.
   (A) low and high (C) intermediate
   (B) high (D) low
6. The output of Schmitt triggers is_____.
   (A) square wave (C) sine wave
   (B) Triangular wave (D) None of above
7. Astable multivibrator has _____ stable state.
   (A) no (C) two
   (B) one (D) None of above
8. _____ gives the ~~triangular~~ Spike output when input is square wave.
   (A) Differentiator (C) both (A) and (B)
   (B) Integrator (D) None of above
9. The differential DC op-amp is mostly used to amplify output of ____
   (A) comparator (C) transducer
   (B) low pass (D) None of above
10. _____is one of the ideal characteristics of op-amp.
    (A) infinite voltage gain (C) infinite CMRR
    (B) zero output resistance (D) All of above

Q-2 **Short answer type question. (any ten)** [20]

1. Draw neat diagram an integrator.
2. What is Op-amp? List its application.
3. Briefly explain voltage converter to current converter.
4. Briefly explain AC follower circuit.
5. Differentiate mono stable and astable multivibrator.

P.T.O.

6. Briefly explain tri-angular wave generator.
7. Briefly explain ideal filter characteristics.
8. What is phase detector? Draw is circuit diagram.
9. Draw the circuit diagram of time mark generator.
10. List basic requirement of good instrumentation amplifier.
11. What do you mean filter? List different type of filter.
12. Draw the circuit of active band pass filter.

Q.3 Draw block diagram of op-amp and also draw pin diagram of 741 IC op-amps and explain it in detail. [10]

OR

Q.3(A) Derive the equation of gain for inverting amplifier with circuit diagram. [07]
Q.3(B) Explain summing op-amp with circuit diagram. [03]

Q.4(A) Explain in detail differential DC op-amp with necessary diagram. [07]
Q.4(B) Explain DC voltage follower circuit. [03]

OR

Q.4 Explain in detail integrator circuit with diagram and wave forms and also derive its output equation. [10]

Q.5 Explain Astable multivibrator in detail with neat diagram and find the equation for total time period T. [10]

OR

Q.5 Write a note on mono stable multivibrator. [10]

Q.6(A) Explain first order butterworth active low pass filter. [05]
Q.6(B) Explain first order butterworth active high pass filter. [05]

OR

Q.6(A) Explain data acquisition using instrumentation amplifier in detail. [07]
Q.6(B) Enlist advantages of active filter over passive filter. [03]