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No. of Printed Pages : 02

SARDAR PATEL UNIVERSITY V.V.NAGAR

B.Sc.(3rd SEM.) INSTRUMENTATION (V)

Thursday, 28th NOVEMBER-2019 EXAMINATION

SUBJECT- OPERATIONAL AMPLIFIER & FILTER

SUB.CODE-US03CINV22

TIME: 2:00 pm to 5:00 pm

MARKS-70

Q-1 Choose correct answer.

[10]

1. When the two terminals are to be at same potential hence two input terminal are said to be _____.
(A) virtually grounded (C) virtually shorted
(B) actually grounded (D) None of above
2. _____ gives the triangular output when input is square wave.
(A) Adding integrator (C) Differentiator
(B) Comparator (D) integrator
3. _____ multivibrator is also called free running oscillator.
(A) Astable (C) Critical
(B) Monostable (D) None of above
4. Active filter use _____ components basically for filtration.
(A) register (C) op-amp
(B) logic gate (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. Mono-stable multivibrator has _____ stable state.
(A) one (C) two
(B) three (D) None of above
8. Current to voltage converter op-amp is also known _____ op-amp.
(A) trans capacitive (C) both (A) and (B)
(B) trans- resistive (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) zero input resistance (C) zero voltage gain
(B) zero output resistance (D) None of above

Q-2 Short answer type question. (any ten)

[20]

1. Draw pin diagram of IC741 with name of pins.
2. Explain phase shift amplifier.
3. Briefly explain current to voltage converter.
4. What do you mean AC voltage follower as op-amp application?

5. List application of mono-stable multivibrator.
 6. Briefly explain tri-angular wave generator.
 7. Briefly explain ideal filter characteristics.
 8. Draw neat diagram an integrator.
 9. Draw the circuit diagram of time mark generator.
 10. Briefly explain summing amplifier.
 11. What do you mean filter? List different type of filter.
 12. Difference between active and passive filter.
- Q.3(A) Explain block diagram of op-amp in detail. [06]
- Q-3(B) List AC and DC parameter of an Op-amp. [04]
- OR
- Q.3 Derive the equation of gain for inverting amplifier with circuit diagram. [10]
- Q.4 Explain in detail differential DC op-amp with necessary diagram. [10]
- 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 Explain Mono stable multivibrator in detail with neat diagram and find the equation for time period T. [10]
- Q.6 Explain data acquisition using instrumentation amplifier in detail. [10]
- OR
- Q.6(A) Explain first order butterworth active low pass filter in detail. [05]
- Q.6(B) Explain first order butterworth active high pass filter in detail. [05]

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