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SARDAR PATEL UNIVERSITY

B.Sc. Semester V (Electronics & Communication) Examination

Date & Day: 11th November 2019, Monday

Time: 10:00 AM to 01:00 PM

Subject Code: US05CELC01

Subject: Analog Circuit Design & it's Applications

Total Marks: 70

Note : The figure right indicates full marks

Q-1 Multiple Choice Questions. **[10]**

1. _____coupling is generally employed in power amplifiers
   [a] Transformer [b] RC
   [c] Direct [d] None
2. The 555 timer IC is used for _____
   [a] Time delay [b] Rectification
   [c] Amplification [d] All of above
3. The efficiency of a Class A amplifier is ____
   [a] 25-50% [b] 50%
   [c] 78.5 [d] Above 78.5%
4. An oscillator employs _____feedback
   [a] Negative [b] Positive
   [c] Both (a) & (b) [d] None
5. If the output of an amplifier is 10 V and 100 mV from the output is fed back to the input, then feedback fraction is____
   [a] 10 [b] 1
   [c] 0.1 [d] 100
6. Bistable multivibratror has ____ stable states.
   [a] 2 [b] 1
   [c] 0 [d] 3
7. In a _____ amplifier, the current flows only during positive half cycle.
   [a] Class A [b] Class B
   [c] Class AB [d] Class C
8. _____ oscillator employs two inductor in series & capacitor in parallel.
   [a] Hartley [b] RC phase shift
   [c] Collpitt's [d] None
9. A class A power amplifier uses_____ transistor
   [a] 3 [b] 1
   [c] 4 [d] 2
10. Negative feedback in an amplifier_____
    [a] Increases noise [b] Reduces bandwidth
    [c] Reduces gain [d] Increases frequency

Q-2 Answer the following (Any Ten) questions. **[20]**

1 Why feedback is necessary in amplifier?

2 List out the different types of multivibrators.

3. Define: oscillator.

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4 Differentiate between negative and positive feedback.
5 List out the applications of crystal oscillator.
6 Draw the labeled circuit of a collpitt's oscillator.
7 Draw a circuit diagram of pulse position modulation.
8 Write a note on Class AB amplifier.
9 List out the different types of feedback in amplifier.
10 Define : Multivibrator .
11 Explain the miller's theorem..
12 Note down the application of 555 timer Ic.

Q-3 A. What is power amplifier? Explain in detail about transformer coupled class A amplifier. **[07]**

B. Differentiate between Class A and Class B amplifier. **[03]**

OR

Q-3 With necessary circuit diagram show that maximum efficiency achievable in Class B push pull amplifier is 78.5%. **[10]**

Q-4 A. With the help of necessary diagram explain the concept of feedback of an amplifier. **[06]**

B. Calculate the gain of a negative feedback amplifier with an internal gain A=100 and feedback factor β=1/10. **[04]**

OR

Q-4 Define: Negative feedback. Derive the expression for negative feedback of an amplifier using voltage series feedback circuit. **[10]**

Q-5 A. What is piezoelectric effect? Explain in detail crystal oscillator. **[05]**

B. Explain Hartley oscillator. **[05]**

OR

Q-5 A. Give the meaning of terms: (a) damping oscillation (b) growing oscillation and (c) Sustained oscillation. **[05]**

B. Note down the principle of RC network and explain the RC phase shift oscillator. **[05]**

Q-6 Sketch the pin diagram of 555 timer Ic also explain each of its pin in brief. **[10]**

OR

Q-6 Define: astable multivibrator. Explain the astable multivibrator with it circuit diagram also draw the functional diagram **[10]**

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