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Register Number:

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**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BANGALORE-27**

**SEMESTER EXAMINATION- APRIL 2020**

**B.SC. ELECTRONICS- II SEMESTER**

**EL218: AMPLIFIERS AND OSCILLATORS**

**Time: 21/2 Hours Max. Marks: 70**

This question paper has **three** parts and **three** printed pages.

**PART-A**

**Answer any FIVE of the following: 5X8=40**

1. Write the circuit for a two stage RC coupled amplifier and explain its working. With its equivalent circuit, derive its voltage gain.
2. a) With necessary circuits explain class B push pull amplifier and prove that its

 maximum circuit efficiency is 78.5%.

 b) Differentiate between single tuned and double tuned amplifiers. **(6+2)**

3. a) Draw an Wein bridge oscillator circuit and explain its working and write the

 expression for frequency of oscillation.

 b) Draw the circuit for a monostable multivibrator using transistor and explain its

 working. Write its expression for its pulse width. **(4+4)**

4. a) Explain the working of IC555 with the help of its internal block diagram.

 b) Define the terms: **i)** CMRR **ii)**Slew rate **iii)**Output Offset voltage. **(5+3)**

5. With the help of necessary circuits derive the voltage gain for dual input

 balanced output differential amplifier.

6. a) Sketch and explain the block diagram of an op-amp.

 b) What is a current mirror circuit? Draw the circuit and derive its output current.

 **(4+4)**

7. a) Write the circuit for a voltage shunt feedback amplifier and derive its voltage

 Gain.

 b) With the help of necessary circuits explain an op-amp integrator. What is the

 need for a practical integrator? **(4+4)**

**PART-B**

 **Answer any FIVE questions: 5X4=20**

8. Determine the output for the given circuit. (Vi=100mV,B1=B2=300)



9. A class A amplifier works on 10V dc. If the maximum change in the collector

 current is 50mA. Find the power transferred to 4Ω speaker through impedance

 matching network.

10. For a given crystal oscillator determine series and parallel resonant frequencies

 having the following values. Rs=2KΩ, Ls=0.1H and Cs=0.022pF, Cm=0.3pF.

 Also find the Q factor for the circuit.

11. Determine the maximum and minimum frequencies of oscillation for given circuit.

 Also find duty cycle for IC555 in Astable multivibrator mode when

 RB=50K



12. The 74IC op-amp having the following parameters is connected as a voltage

 series feedback amplifier with R1=10k and RF=100k, A=2x105, Ri=2MΩ,

 Ro=75Ω, fo=5Hz. Compute AF, RiF, ROF, and ff.

13. Determine Vo for the given circuit. (Vcc=12V and VEE=-12V all the resistors

 have the same value).



14. Design an active low pass filter for a midband gain of 10 and cut off frequency of

 15kHz.

**PART-C**

 **Answer any FIVE questions: 5X2=10**

15.Class C amplifier is also a tuned amplifier. Justify.

16.Mention the significance of Darlington pair transistor.

17. Bistable multivibrator is also known as a latch circuit. Why?

18. In the given circuit,



1. What is the expected output?
2. If 8k is shorted. What is the output?

19. What is meant by UGB? What is its significance.

20. Sketch the output for the following circuit.(VCC=12V,VEE=-12V)



21. What is meant by 2nd order filters? Mention their advantages over first order

 filters.

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