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PRESIDENCY UNIVERSITY BENGALURU

SCHOOL OF ENGINEERING

MAKEUP EXAMINATION - JULY 2024

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| **Semester :3** | **Date :05-07-2024** |
| **Course Code : EEE2009** | **Time : 09:30am to 12:30pm** |
| **Course Name : Analog Electronics Circuits** | **Max Marks :100** |
| **Program : B. Tech** | **Weightage :50%** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Question paper consists of 3 parts.*
3. *Scientific and non-programmable calculator are permitted.*
4. *Do not write any information on the question paper other than Roll Number.*

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| **PART A** | | | |
| **ANSWER ANY 4 QUESTIONS 4Q X 5M=20M** | | | |
| 1 | In a common base connection, the emitter current is 1mA. If the emitter circuit is open, the collector current is 50 μA. Find the total collector current. Given that α =  0.92. | (CO 1) | [Knowledge] |
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| 2 | Discuss the application of Clipper and Clampers. | (CO1) | [Knowledge] |
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| 3 | Explain the characteristics of zener diode. | (CO1) | [Comprehension] |
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| 4 | What is biasing? What are the different biasing circuits used for operating BJT as amplifiers? | (CO2 | [Comprehension] |
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| 5 | Identify the below circuit and derive the drain to source voltage (VDS) and drain current (ID) for this circuit. | (CO2) | [Comprehension] |
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| 6 | A rectifier is an electrical device that converts AC to DC current. A mobile  phone can only be charged expeditiously if a constant, consecutive voltage  supply is provided to it. Draw the circuit diagram of the mobile battery charger by explaining its different components. | (CO3) | [Comprehension] |
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| **PART B** | | | |
| **ANSWER ANY 5 QUESTIONS 5Q X 10M=50M** | | | |
| 7 | An amplifier has a voltage amplification Av and a fraction mv of its output is fedback in opposition to the input. If mv = 0.1 and Aν = 100, calculate the percentage change in the gain of the system if Aν falls 6 db due to ageing. | (CO1) | [Comprehension] |
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| 8 | The amplifier characteristics constitute high input impedance and low output impedance. Mr. Nagesh constructed the below circuit and he claimed that it perfectly worked as an amplifier. Is the below circuit carries the features of an amplifier? If yes then prove it by finding its input and output impedance.  http://guqbms.inpods.com:57953/api/v1/downloadFile?fileId=13738&tenantid=13 | (CO2) | [Comprehension] |
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| 9 | In a School Function more number of speakers used but to cascade all speakers require amplifiers. Explain the Common Emitter Amplifier Characteristics. | (CO3) | [Apply] |
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| 10 | Discuss the Characteristics of JFET. | (CO3) | [Comprehension] |
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| 11 | Design a Colpitts oscilator using the data given below: A 1 mH inductor is available. Choose the capacitor values in a Colpitts oscillator so that f = 1 MHz and mv = 0.25. | (CO3 | [Apply] |
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| 12 | A 1 pF capacitor is available. Choose the inductor values in a Hartley oscillator so that f = 1 MHz and mv = 0.2. | (CO4) | [Apply] |
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| 13 | Mr. Bijo conducted experiment in a laboratory and Produce a oscillation using Colpitts Oscillator. Discuss the operation of Colpitts Oscillator. | (CO4) | [Apply] |
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| **PART C** | | | |
| **ANSWER ANY 2 QUESTIONS 2Q X 15M=30M** | | | |
| 14 | In an n-channel JFET biased by potential divider method, it is desired to set the operating point at ID = 2.5 mA and VDS = 8V. If VDD = 30 V, R1 = 1 MΩ and R2 = 500 kΩ, find the value of RS. The parameters of JFET are IDSS = 10 mA and VGS (off) = – 5 V | (CO3) | [Apply] |
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| 15 | In a self-bias n-channel JFET, the operating point is to be set at ID = 1.5 mA and VDS =10 V. The JFET parameters are IDSS = 5 mA and VGS (off) = − 2 V. Find the values of RS and RD. Given that VDD = 20 V. | (CO3) | [Apply] |
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| 16 | Explain the concept of Different topology of Feedback given below:   1. Voltage-series Feedback 2. Voltage-shunt Feedback 2. Current-series Feedback 4. Current-shunt Feedback | (CO4) | [Apply] |
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