QP Code : 25992

Max. Time: 3 hr

Max. Marks: 80

Q.1 is compulsory (any Four). Attempt any 3 from Q.2 to Q.6

1(a) For the circuit shown in Fig.1, find the value of R if the circuit regulates at 6 V for the input supply voltage of 22 V. The zener diode currents are minimum 10mA and maximum 40mA. The load current IL varies from 0 to Vmax. What is the value of I_{max}? Also, find the power rating of the zener diode. (5)
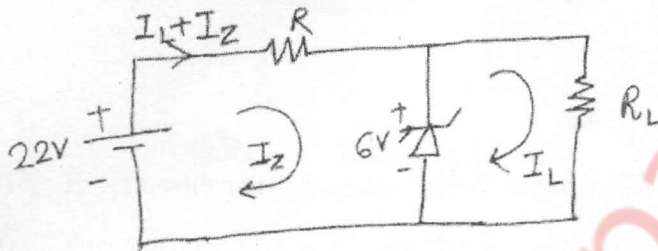

Fig. 1

1(b) Determine the I_B, I_C, V_{CE}, V_C and V_{BC} for the fixed-bias configuration of fig.2. (5)
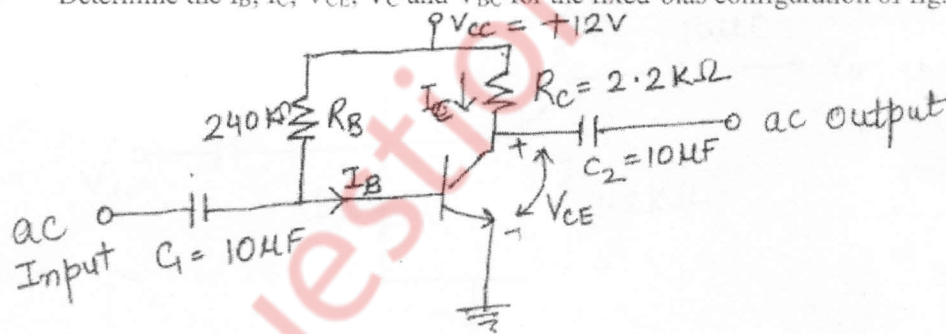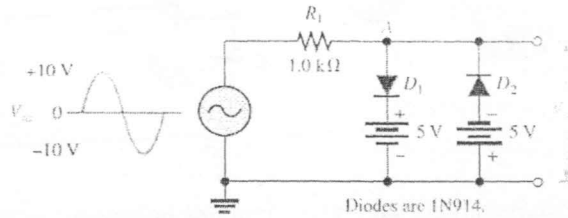

Fig. 2

1(c) Explain the term "Field Effect" in JFET. (5)

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1(d)   Draw and explain series voltage regulator.   (5)

1(e)   Define a filter. How are filters classified?   (5)

2(a)   Determine the output voltage waveform.   (5)

2(b)   Design a clamper to perform the function   (5)
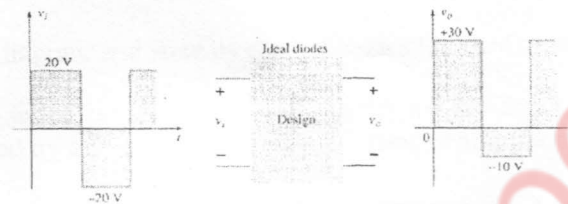
2(c)   Explain with a neat diagram a transformer coupled audio power amplifier   (10)

3(a)   Given that I_C=2mA and V_{CE}= 10V, determine R_1 and R_C for the network shown (10) in fig. below.
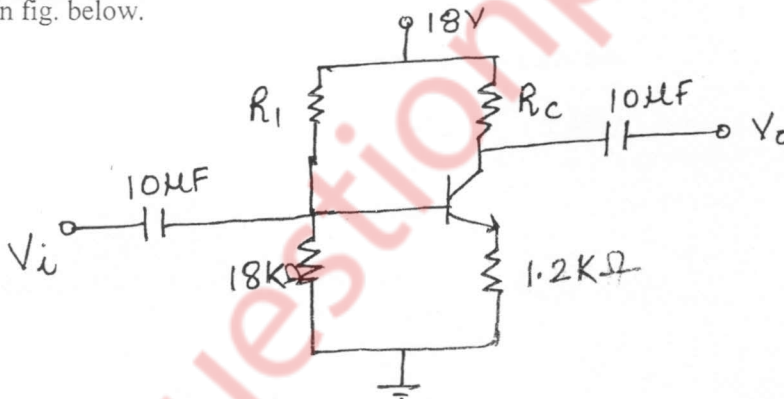
3(b)   What do you understand by Thermal runaway?   (5)

3(c)   How transistors can be used as switches?   (5)

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4(a) Determine V_{GS}, I_D, V_{DS} for the fixed Bias configuration as shown if fig below.   (10)

$I_{DSS} = 10\,mA$

$V_P = -8V$
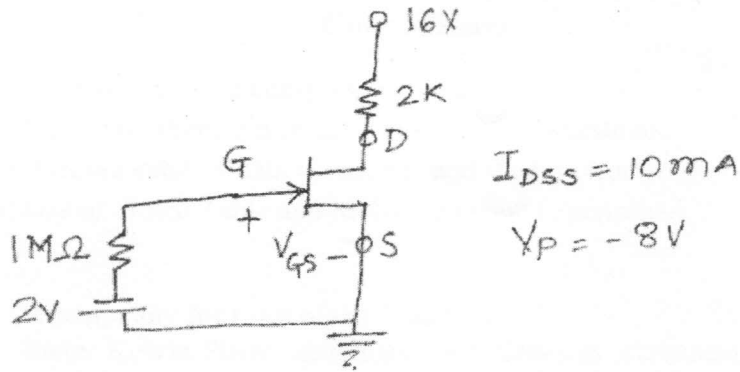
4(b) Explain the structure, operation and current-voltage characteristics   (10)
of Enhancement type MOSFET.

5(a) Draw the block diagram and state its characteristics for ideal op-amp.   (5)

5(b) Design a scaling amplifier circuit that will amplify the first input by a factor   (5)
of 3 and a second by a factor of 4. Use the inverting configuration for the same.

5(c) Draw the circuit diagram for Integrator. Derive the necessary equations. Draw
its frequency response. How the problems of basic integrator can be corrected.   (10)

6(a) Write down the condition for oscillations. Draw the circuit for a Wein bridge
oscillator and derive the expressions for frequency and gain.   (10)

6(b) Using standard 5%resistances, design a circuit such that   (10)

$$V_0 = -2(2v_1 + 3v_2 - 2v_3).$$

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