**Time: 3 hours**   **Marks: 80**

1. **Question 1 is compulsory.**
2. **Attempt any three question out of remaining questions.**
3. **Assume suitable data if necessary.**

Q.1   Attempt any four.

A.   Draw Output Characteristics of BJT in CE configuration and state the importance   5M
       of active region.

B.   Compare N Channel JFET and P Channel JFET.   5M

C.   Explain Varactor diode with the help of its construction, working principal and   5M
       characteristics.

D.   Explain Series voltage regulator using zener diode and a transistor.   5M

E.   Explain working of Biased Clamper.   5M

Q2. A   Explain working of Full wave rectifier with C filter. Also draw output waveforms   10M
        and derive expression for ripple factor.

Q2. B   For the given circuit obtain the value of Zin, Zo and Av. Given VGS(TH)=3V,   10M
        k=0.4mA/V2 , rd=40kΩ

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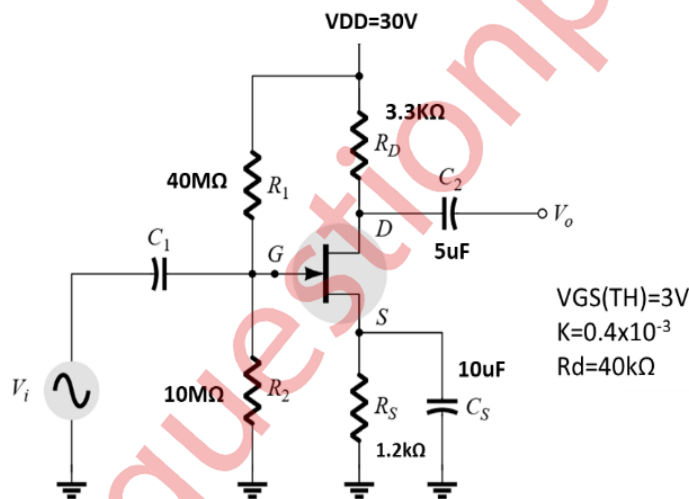
Q3. A   Derive equation of input resistance, output resistance, current gain and voltage gain for CB Amplifier.   10M

Q3. B   For the given E-MOSFET circuit, determine the values for IDQ, VGSQ and VDSQ.   10M
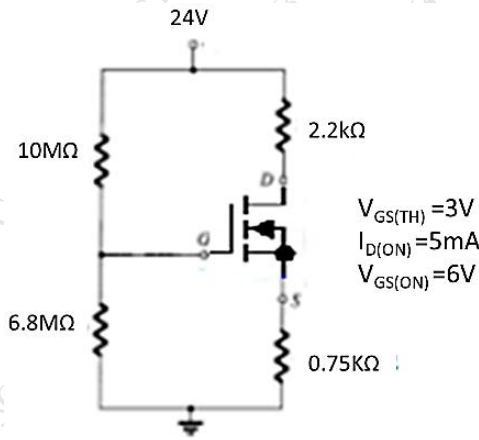
Q4. A   Compare CE, CB and CC Amplifiers.   10M

Q4. B   Draw Energy Band diagram of PN junction diode under i) Zero Bias ii) Forward Bias and iii) Reverse Bias   10M

Q5. A   Find I_B, I_C, V_{CE}, Vc, VE for the following circuit (β=100).   10M
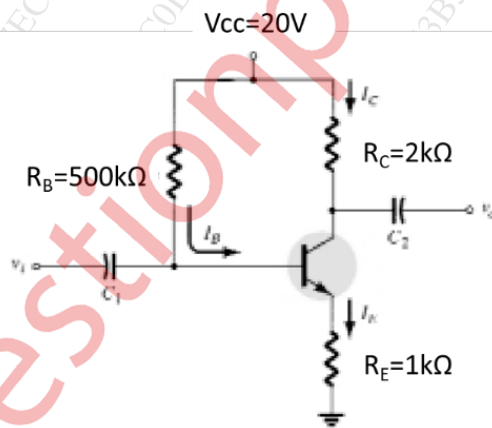
Q5. B   Explain Solar cell with reference to construction, working and VI Characteristics.   10M

Q6. A   Design a single stage CE Amplifier for the following specifications: 15M
Av> 100, S=10, Vo=3V, FL=20Hz. Use BC147A. Coupling and bypass capacitors are as follows CC1=CC2= 10uF and CE=100uF
Specifications of BC547B: hfe =125, hie=2.7KΩ, VBE=0.7V

Q6. B   Explain Series Clipper using Diodes.   5M

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