SREE VIDYANIKETHAN ENGINEERING COLLEGE
(An Autonomous Institution, Affiliated to JNTUA, Ananthapuramu)
I B.Tech II Semester (SVEC-16) Regular/Supplementary Examinations June - 2018
ELECTRONIC DEVICES AND CIRCUITS
[Electrical and Electronics Engineering, Electronics and Communication Engineering, Electronics and Instrumentation Engineering]

Time: 3 hours   Max. Marks: 70

Answer One Question from each Unit.
All questions carry equal marks.

UNIT-I

1   a)   Explain the working of bridge rectifier with neat suitable diagram.   7 Marks
    b)   Define depletion region at p-n junction. What is the effect of forward and reverse biasing of p-n junction on depletion region? Explain with necessary diagrams.   7 Marks

(OR)

2   a)   Derive the expression for I_{dc} and I_{rms} for half-wave rectifier.   8 Marks
    b)   A half-wave rectifier circuit supplies 100mA DC to a 250Ω load. Find the DC output voltage, PIV rating of a diode and the r.m.s. voltage for the transformer supplying the rectifier.   6 Marks

UNIT-II

3   a)   Explain how transistor works as an amplifier.   6 Marks
    b)   Explain the output characteristics of a transistor in CB configuration.   8 Marks

(OR)

4   a)   Compare the performance of BJT as an amplifier in CE, CB and CC configurations.   5 Marks
    b)   A CE transistor amplifier with voltage divider bias circuit is designed to establish the quiescent point at $V_{CE} = 12V$, $I_C = 2mA$ and stability factor S ≤ 5.1. If $V_{CC} = 24V$, $V_{BE} = 0.7V$, $\beta = 50$ and $R_C = 4.7K\Omega$, determine the values of resistors R_E, R_1 and R_2.   9 Marks

UNIT-III

5   a)   Explain the concept of Millers theorem and its applications.   8 Marks
    b)   Compare enhancement and depletion modes of a MOSFET with the help of its characteristics and construction.   6 Marks

(OR)

6   Draw the circuit diagram and small signal equivalent of CB amplifier using accurate h-parameter model. Derive expressions for A_V, A_I, R_i and R_0.   14 Marks

UNIT-IV

7   a)   Compare and contrast BJT and FET.   6 Marks
    b)   Show that the transductance g_m of a JFET is related to the drain current I_{DS} by   8 Marks

$$g_m = \frac{2}{|V_\rho|}\sqrt{I_{DS}.I_{DSS}}\ .$$

(OR)

8   Sketch the basic structure of an n–channel junction field effect transistor and explain its working with the help of drain characteristics.   14 Marks

UNIT-V

9   What is the photodiode? Explain its principle of operation and applications in detail.   14 Marks

(OR)

10   Explain the characteristics of UJT. Indicate the negative resistance region.   14 Marks

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