



Daffodil International University

Department of Computer Science and Engineering

Faculty of Science and Information Technology

Final Examination, Semester: Fall-2019

Course Code: CSE 224 (Day)

Course Title: Electronics Devices and Circuits

Time: 02:00 Hours

Full Marks: 40

Answer all the questions

Q1. *Answer any Four out of Five questions*

4x2=
8

Define (a) Faithful amplification (b) Transistor biasing (c) Thermal runaway (d) Positive and negative feedback (e) OP-AMP.

Q2. *Answer any Four out of Five questions*

4x4=
16

- Describe the working principle of npn transistor.
- Describe the universal method of transistor biasing.
- Compare among the BJT, JFET and MOSFET.
- Describe the principles of negative voltage feedback in amplifier.
- Describe the operation of Colpitt's oscillator and also find out the frequency and feedback fraction.

Q3. *Answer all the Four questions*

4x4=
16

- A crystal diode having internal resistance $r_f = 21 \Omega$ is used for half-wave rectification. If the applied voltage $v = 100 \sin \omega t$ and load resistance $R_L = 979 \Omega$, find : (i) I_m , I_{dc} , I_{rms} (ii) ac power input and dc power output.
- For a certain transistor, the emitter current is 1mA. If the emitter circuit is open, the collector current is 100 μA . Find the (i) total collector current and (ii) base current. Given that $\alpha = 0.9$.
- When negative voltage feedback is applied to an amplifier of gain 1000, the overall gain falls to 50.
(i) Calculate the fraction of the output voltage feedback.
(ii) If this fraction is maintained, calculate the value of the amplifier gain required if the overall stage gain is to be 25.
- Design an oscillator which can generate a frequency of 1KHz, if the following information are available :
One inductor of 1000mH and feedback fraction, $m_v = 0.1$. Also draw the feedback circuit only.