Example of a Bachelor's Degree Exam Grid
Course "Radiocommunications"
Study program: Telecommunication Technologies and Systems

1) What is the function of the RF POWER AMPLIFIER and the RF AMPLIFIER?
   a. They increase the power level of the message signal to the speaker.
   b. They increase the power level of the message and carrier signals to the modulator.
   c. They function as the automatic gain control.
   d. They increase the power level of the transmitted and received signals, respectively.

2) If a 3 kHz message signal modulates an 800 kHz carrier signal, what frequency are contained in the AM radio signal?
   a. 797 kHz, 800 kHz, and 803 kHz
   b. 3 kHz and 800 kHz
   c. 800 kHz and 803 kHz
   d. 797 kHz and 803 kHz

3) The gain of the RF stage is 58 dB. If the RF stage output power level is -20 dBm, what is the input power?
   a. 38 dBm
   b. -40 dBm
   c. 78 dBm
   d. -78 dBm

4) What is the purpose of an AGC circuit?
   a. to keep the gain of the RF stage constant
   b. to keep the beat frequency oscillator (BFO) frequency equal to the carrier frequency
   c. to maintain the audio signal volume regardless of the variations in the received signal power
   d. to lock-in the RF filter to the received signal frequency

5) For an FM signal, what does the term *frequency deviation* mean?
   a. the center frequency plus the modulation percentage
   b. the change in frequency from the center frequency
   c. the modulation index times the center frequency
   d. the message signal frequency plus or minus the center frequency

6) If a PLL is functioning as an FM detector, what occurs when the FM bandwidth becomes greater than the lock range?
   a. The recovered message signal becomes slightly distorted.
   b. There is no effect on the operation of the PLL discriminator.
   c. The message signal is not recovered from the FM signal.
   d. The free-running frequency of the VCO changes.

7) For a class C amplifier, the conduction angle τ must be in the following range:
   a. $180° < \tau < 360°$
   b. $\tau < 180º$
   c. $\tau < 90º$
   d. $\tau = 180º$

8) The polarization of an electromagnetic wave is defined as
   a. the orientation of plane in which the electric field resides.
   b. the orientation of plane in which the electromagnetic field propagates.
   c. the orientation of plane in which the magnetic field resides.
   d. the geometric locus of the points in which the vectors (E, H) oscillate in phase.

9) A digital communication system transmits data at a bit rate of $\boldsymbol{R_b}$ **= 1.8 Mbps** using QPSK modulation on a carrier frequency of $\boldsymbol{f_c}$ **= 2.4 GHz**. The symbol rate of the transmitted signal is:
   a. 1.8 Msym/s
   b. 900 ksym/s
   c. 300 ksym/s
   d. 450 ksym/s.

Each correct answer receives 1 point. One point is awarded automatically to the total score.