Paper Code – 5305

M.Sc. Semester-III (Physics)

July-Septermber-2021

EPH-602 Pulse and Microwave Electronics

કુલ સમય :– : ૩૦ મીનીટ કુલ પ્રશ્નો : ૩૫ વિદ્યાર્થીએ ટીક કરવાના પ્રશ્નો : ૧૮

નોંધ : વિદ્યાર્થીએ માત્ર ૧૮ પ્રશ્નો જ ટીક કરવાના રહેશે. જો વધારે ટીક કરેલ હશે તો પ્રથમ ૧૮ પ્રશ્નો જ ગણતરીમાં લેવામાં આવશે.

1. In which configuration a dead band condition occurs in Schmitt trigger
   A Differential amplifier with positive feedback B Voltage follower with positive feedback
   C. Comparator with positive feedback D. None of the mentioned
2. When a rectangular voltage waveform is applied to a capacitor, then the current waveform is ……
   A. Rectangular B. Sinusoidal C. Sawtooth D. Square
3. The positive clipper is that which removes the ……. half-cycles of the input voltage.
   A. Negative B. Positive C. Both positive and negative D. None of the above
4. One would find a clamping circuit in ……..
   A.Receiving antenna B. Radio transmitter C. Radio receiver D. Television receiver
5. When a transistor is used as an amplifier, it is operated in the …… region
   A. Off B. Saturation C. Active D. None of the above
6. A negative clipper removes the …… half-cycles of the input voltage
   A. Negative B. Positive C. Both positive and negative D. None of the above
7. Coupling into and out of a traveling-wave tube can be accompanied by a
   A. Waveguide match B. Cavity match C. Direct coax-helix match D. All of the above
8. A high-power microwave pulse of the order of megawatts can be generated by a
   A. traveling-wave tube B. magnetron C. reflex klystron D. Gunn diode
9. A traveling-wave tube (TWT) amplifies by virtue of
   A. The absorption of energy by the signal from an electron stream
   B. The effect of an external magnetic field
   C. The energy contained the cavity resonators
   D. The energy liberated from the collector
10. Microwave frequencies are normally regarded as those in the range of
    A. 1 to 500 MHz B. 1000 to 10,000 GHz C. 1 to 100 GHz D. 10 to 1000 GHz
11. The highest frequency which a conventional vacuum-tube oscillator can generate is not limited by the
    A. Electron transit time B. Distributed lead inductance
    C. Inter-electrode capacitance D. Degree of emission from the cathode
12. As the electron beam moves through a klystron's inter cavity drift space
    A. Frequency modulation at the input cavity creates velocity modulation at the output cavity
    B. Velocity modulation at the input cavity creates density modulation at the output cavity
    C. Density modulation at the input cavity creates velocity modulation at the output cavity
    D. Phase modulation at the input cavity creates velocity modulation at the output cavity.
13. The frequency of the oscillation generated by a magnetron, is mainly determined by
    A. The flux density of the external magnet B. The ratio of the dc cathode voltage to the magnetic flux density
    C. The number of the cavity resonators D. The dimension of each cavity resonator
14. If the instantaneous RF potentials on the two sides of a magnetron cavity are of opposite polarity, the operation is in the
    A. π mode B. $\pi/2$ mode C. 2π mode D. $\pi/4$ mode
15. The Gunn diode oscillator
    A. Is capable of generating continuous microwave power of the order of kilowatt
    B. Generates frequencies which are below 100 MHz
    C. Operates over a positive resistance characteristic
    D. Depends on the formation of charge domain
16. Klystron oscillators are most often used in the frequency range of
    A. 300 to 3000 MHz B. 3000 to 30000 MHz C. 30 to 30000 MHz D. 10 to 10000 MHz
17. Oscillators of a klystron tube are maintained
    A. By bunches of electrons passing the cavity grids
    B. By plate-to-cathode feedback
    C. By feedback between the accelerating grid and the repeller
    D. By circulating bunches of electrons within the cavities.

18. What allow microwave to pass in only one direction?
    A. RF emitter B. Capacitor C. Varactor-triac D. Ferrite emitter
19. In an SHF pulsed radar set, a reflex klystron can be used as a
    A. Single mixer stage B. Local oscillator C. Transmitter oscillator D. Duplexer stage
20. A reflex klystron is oscillating at the frequency of its resonant cavity. If the reflector voltage is made slightly less negative, the
    A. Oscillation will cease B. Output power would increase
    C. The frequency will decrease D. Bunching would occur earlier in time
21. The coarse frequency adjustment of a reflex klystron is accomplished by
    A. The AFC system B. Adjusting the flexible wall of the resonant cavity
    C. An adjustment in the synchronizer D. Varying the repeller voltage
22. In a pulsed radar set, the STC circuit is used to
    A. Improve the target bearing resolution
    B. Increases receiver sensitivity for echoes from targets
    C. Vary the pulse frequency in order to control the maximum target
    D. Reduce interference from the effects of sea return
23. In a pulsed radar set, the function of the duplexer is to
    A. Aid in calibrating the display unit B. Prevent frequency drift in the klystron
    C. Allow the transmitter and the receiver to operate from a common antenna D. All of these
24. A magnetron is operated at a duty cycle of 0.001. It has a peak power output of 100 kilowatts. Its average power is
    A. 10,000 watts B. 100 watts C. 1,000 watts D. 1,000,000 watts
25. The main frequency determining element of a klystron is
    A. The repeller voltage B. The accelerating voltage C. Its resonant cavity D. Its mode of operation
26. Which of the following is used as a high power microwave oscillator?
    A. Thyratron B. Magnetron C. Klystron D. Reflex-klystron
27. A dipole antenna is also called as?
    A. Marconi antenna B. Yagi antenna C. Bidirectional antenna D. Hertz antenna
28. The impedance at the center of the antenna is known as?
    A. Characteristic impedance B. Radiation resistance
    C. Transmission impedance D. Recovery resistance
29. What happens when the radiation resistance of the antenna matches the characteristic impedance of the transmission line?
    A. No transmission occurs B. No reception occurs C. SWR is maximum D. SWR is minimum
30. The type of dipole antenna that has a higher band width is called as?
    A. Conical antenna B. Yagi antenna C. Helical antenna D. Marconi antenna
31. What is the power radiated by the antenna with gain called as?
    A. Critical power B. Transverse power C. Effective radiated power D. Transmitted power
32. Which of the following antennas produce a vertical radiation pattern?
    A . Dipole antenna B. Yagi antenna C. Marconi antenna D. Hertz antenna
33. Why is the boom of the yagi antenna connected to a metal mast and electrical ground?
    A. Better signal directivity B. Increased bandwidth
    C. Lightning protection D. To avoid short circuiting
34. Which of the following is not one of the types of driven array antenna?
    A. Rectilinear antenna B. Broadside antenna C. End fire antenna D. log periodic antenna
35. What is the beam width for a half wave dipole antenna?
    A. 90° B. 180° C. 50° D. 250°