

1. Input impedance at very high frequency for triode tube is

- a.
- b. $[L_k g_m^2 C] - j[L_k g_m \omega C]$
- c. $[L_k g_m^2 C] - j[L_k g_m \omega C]$
- d. $[L_k g_m \omega C] - [L_k g_m^2 C]$

2. Input admittance of pentode tube circuit is

- a. $L_k g_m^2 C + j\omega [C_k + C_m]$
- b. $L_k g_m^2 C - j\omega [C_k + C_m]$
- c. $L_k g_m \omega C + j\omega [C_k + C_m]$
- d. $L_k g_m \omega^2 C - j\omega [C_k - C_m]$

3. Input impedance of pentode tube circuit is

- a.
- b. $[L_k g_m^2 C] + j\omega [C_k + C_m] [L_k g_m^2 C]$
- c. $[L_k g_m^2 C] - j\omega [C_k + C_m] [L_k g_m^2 C]$
- d. $[L_k g_m^2 C] + j\omega [C_k + C_m] [L_k g_m^2 C]$

4. At frequencies above 1GHz, conventional tubes are impaired by

- a. large circuit capacitance between tube electrodes
- b. low circuit capacitance between tube electrodes

- c. low circuit inductance between tube electrodes
 - d. high input resistance
5. At frequencies above 1GHz, conventional tubes are impaired by
- a. large circuit inductance of lead wire
 - b. low circuit capacitance between tube electrodes
 - c. low circuit inductance between tube electrodes
 - d. high input resistance
6. Input admittance of triode tube is
- a. $j\omega C + L_k g_m^2 C$
 - b. $j\omega C - L_k g_m^2 C$
 - c. $j\omega C + L_k g_m C$
 - d. $j\omega C + L_k g_m$
7. As the frequency is increased upto microwave range, the real part of input admittance of conventional tubes is
- a. large & cause over load of input circuit
 - b. 10
 - c. zero & cause over load of output circuit
 - d. low & cause over load of output circuit
8. As the frequency is increased upto microwave range, the real part of input admittance of conventional tubes is
- a. large & reduce operating efficiency of tube
 - b. low & reduce operating efficiency of tube
 - c. zero & increase operating efficiency of tube
 - d. 10
9. For a triode circuit at microwave frequencies, input voltage is
- a. $V_g + j\omega L_k g_m V_g$
 - b. $V_g - j L_k g_m V_g$

c. $V_g - j L_k g_m$

d. $V_g + j g_m V_g$

10. For a triode circuit at microwave frequencies, input current is

a. $j\omega C V_g$

b. $j L_k g_m$

c. $j C$

d. $j g_m V_g$

11. One of the following is used to minimize inductance & capacitance effects [intubes]

a. reduction in lead length & electrode area

b. increase in lead length & electrode area

c. reduction in lead length only

d. increase in electrode area only

12. For a pentode output tuned circuit, load voltage is

a.

b.

c.

d.

13. Minimization of inductance & capacitance effects limits

a. power handling capacity

b. input impedance

c. output impedance

d. power dissipation capacity

14. Electron transit angle is defined as

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- a. $\omega d / v_0$
- b. ωd_0
- c. ω / dv_0
- d. $\omega d + v_0$

15. At microwave frequencies, trans admittance becomes

- a. complex number with relatively small magnitude
- b. real number with relatively large magnitude
- c. zero
- d. infinity

16. Transit angle effect can be minimized by

- a. first accelerating electron beam with a very high dc voltage & then velocity modulating it
- b. first decelerating electron beam with a very high dc voltage & then velocity modulating it
- c. first accelerating electron beam with a very low dc voltage & then velocity modulating it
- d. first decelerating electron beam with a very low dc voltage & then velocity modulating it

17. For a pentode output tuned circuit, maximum voltage gain at resonance is

- a. g_m / G
- b. $g_m V_g / G$
- c. $g_m V_g G$
- d. $g_m G$

18. For a pentode output tuned circuit, band width is

- a. G/C for $[G/2C]^2 \leq 1/LC$
- b. $G+C$ for $[G/2C]^2 \leq 1/LC$
- c. GC for $[G/2C] \leq 1/LC$
- d. G/C for $[G/2C]^2 = 1/LC$

19. For a pentode output tuned circuit, gain band width product is

- a. independent of frequency
- b. dependent on frequency
- c. infinity

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- d. zero
20. For a pentode output tuned circuit, gain band width product is
- a. g_m / C
- b. $g_m - C$ for $[G/2C]^2 \gg 1/LC$
- c. $g_m + C$
- d. $g_m C$
21. One of the following is assumed in the operation of two cavity klystron
- a. space charge effects are negligible
- b. space charge effects are considered
- c. transit time effects not considered
- d. transit angle effects considered
22. Represents shown in figure (a)

Figure(a)

- a. coaxial cavity
- b. radial cavity
- c. tunable cavity
- d. toroidal cavity
23. Efficiency of two cavity klystron amplifier is
- a. 40 %
- b. 10 %
- c. 70 %
- d. 100 %
24. For two cavity klystron amplifier, average power is
- a. 500KW
- b. 100KW
- c. 2000KW
- d. INFINITY
25. For two cavity klystron amplifier , pulsed power is

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- a. 30 MW at 10GHz
 - b. 100MW at all frequencies
 - c. 200 KW at 10 GHz
 - d. 10mw at 10 GHz
26. In microwave devices, _ _ _ _ _ used to obtain overall high gain over a broad band width
- a. reentrant cavities or slow wave structure
 - b. Si Ge compound materials
 - c. only multiple cavities
 - d. noise & multiple cavities
27. Two cavity klystron operated by
- a. Velocity & current modulation
 - b. AM & FM
 - c. PWM
 - d. PAM & PCM
28. The variation in electron velocity in the drift space is known as
- a. Velocity modulation
 - b. AM
 - c. Current modulation
 - d. Noise
29. _ _ _ _ is transferred from electrons to the field of second cavity in klystron amplifier
- a. kinetic energy
 - b. potential energy
 - c. ionization energy
 - d. surface energy
30. Two cavity klystron amplifier, power gain is
- a. 30 db
 - b. 20 db
 - c. 10 db
 - d. 50 db
31. Represents shown in figure (a)

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Figure(a)

- a. butterfly cavity
- b. coaxial cavity
- c. radial cavity
- d. tunable cavity

32. For a coaxial cavity, Z =

- a.
- b.
- c.
- d.

33. For a coaxial cavity , inductance of cavity is

- a.
- b.
- c.
- d.

34. Represents shown in figure (a)

Figure(a)

- a. tunable cavity
- b. coaxial cavity
- c. radial cavity

d. toroidal cavity

35. Capacitance of gap, C_g is

a.

b.

c.

d.

36. For coaxial cavity at resonance, $\tan \beta l =$

a.

b. $dV / [a^2 \ln b/a]$

c. $dV / [\omega \ln b/a]$

d. $dV / [\ln b/a]$

37. Represents shown in figure (a)

Figure(a)

a. radial cavity

b. coaxial cavity

c. tunable cavity

d. toroidal cavity

38. Represents shown in figure (a)

Figure(a)

a. toroidal cavity

b. coaxial cavity

c. radial cavity

d. tunable cavity

39. In a reentrant cavity

- a. metallic boundaries extend into interior of cavity
- b. metallic boundaries are not extend into interior of cavity
- c. metallic boundaries extend into interior of drift space
- d. metallic boundaries extend into interior of cathode

40. The inductance of radial reentrant cavity, L is

- a.
- b.
- c.
- d.

41. Capacitance of radial reentrant cavity is

- a.
- b.
- c.
- d.

42. Beam coupling coefficient of input cavity gap is

- a. $\sin [\quad / 2] / [\quad / 2]$
- b. $\sin [\quad / 2] / qg$
- c. $\sin [\quad / 4] / [\quad / 4]$
- d. $\sin [\quad / 3] / [\quad / 3]$

43. The average microwave voltage in buncher gap is

a.

b. $\{ \cos \quad - \cos[\quad + \quad / V \quad] \}$

c. $V \quad \{ \cos \quad - \cos[\quad + \quad / V \quad] \}$

d. $V \quad \{ \cos \quad - \cos[\quad + \quad] \}$

44. The transit time for an electron to travel a distance of L in 2 cavity klystron is

a. $T \quad [1 - \quad V \quad \text{SIN} [\quad - 0.5] / 2 V \quad]$

b. $T \quad [1 + \quad V \quad \text{SIN} [\quad + 0.5qg] / 2 V \quad]$

c. $T \quad [1 - \quad V \quad \text{SIN} [\quad + 0.5qg] / V \quad]$

d. $T \quad [1 - \quad V \quad \text{SIN} [\quad - 0.5qg] V \quad]$

45. If the electrons are accelerated by high dc voltage V_0 before entering the buncher grids, their velocity is

a. $0.593 \times 10 \quad \text{m/s}$

b. $593 \times 10 \quad \text{m/s}$

c. $5.93 \times 10 \quad \text{m/s}$

d. $59.3 \times 10 \quad \text{m/s}$

46. _____ is called depth of velocity modulation

a. $\beta_1 V_1 / V_0$

b. $\beta_1 V_0 / V_1$

c. $\beta_1 V_1 V_0$

d. $\beta_1 / V_1 V_0$

47. The minimum velocity (2 cavity klystron) in bunching process is

a. $v_0 [1 - \beta_1 V_1 / 2 V_0]$

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b. $v_0 [1 + \beta_1 V_1 / 4 V_0]$

c. $v_0 [1 - \beta_1 / V_1 V_0]$

d. $v_0 [1 + \beta_1 V_1 / 3 V_0]$

48. The maximum velocity (2 cavity klystron) in bunching process is

a. $v_0 [1 + \beta_1 V_1 / 2 V_0]$

b. $v_0 [1 + \beta_1 V_1 / 4 V_0]$

c. $v_0 [1 - \beta_1 / V_1 V_0]$

d. $v_0 [1 + \beta_1 V_1 / 3 V_0]$

49. The distance from buncher grid to location of dense electron bunching ΔL is

a. $v_0 \pi V_0 / \omega \beta_1 V_1$

b. $p V_0 / w^2 \beta_1 V_1$

c. $v_0 V_0 / w^3 \beta_1 V_1$

d. $v_0 [1 + \beta_1 V_1 / 3 V_0]$

50. The equivalent mutual conductance of klystron amplifier is

a. $2 I J (X) / V$

b. $V / 2 I V$

c. $I J (X) / V$

d. $2 I J (X)$

51. The optimum distance L at which the maximum fundamental component of current occur is (klystron amplifier)

a. $3.682 V v / V \omega$

b. $3.675 v / V \omega$

c. $3.889 V v / V \omega$

d. $2.682 V / V \omega$

52. Bunching parameter of klystron is

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a. $\frac{V}{2} \text{ V}$

b. $\frac{V}{3} \text{ V}$

c. $\frac{V}{4} \text{ V}$

d. $\frac{V}{2} \text{ V}$

53. The fundamental component of beam current at catcher cavity has a magnitude of

a. $2 I_0 \text{ J}$ [X]

b. $\frac{V}{2} \text{ V}$

c. $2 I_0 \text{ J}$ [X]

d. $5 I_0 \text{ J}$ [X]

54. The fundamental component of beam current has its maximum amplitude at $x =$

a. 1.841

b. 2.841

c. 1.5

d. 1.899

55. Output power delivered to catcher cavity and load is[klystron amplifier]

a. $\frac{I_0 V_0}{2}$

b. $\frac{I_0 V_0}{2 I_0 V_0}$

c. $\frac{I_0 V_0}{2 I_0}$

d. $\frac{I_0 V_0}{V_0}$

56. The electronic efficiency of klystron amplifier is

a. $\frac{I_0 V_0}{2 I_0 V_0}$

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b. $2I_0 V_0$

c. $I_0 / 2I_0 V_0$

d. $I_0 V_0 / 2$

57. If the coupling is perfect $\mu = 1$, the maximum beam current approaches $I_0 =$ [klystron amplifier]

a. $2I_0 (0.582)$

b. $10I_0$

c. $2I_0 V_0$

d. $4I_0$

58. Input voltage in terms of bunching parameter X [klystron amplifier] is

a. $[2V_0 / I_0] X$

b. $[2V_0 / I_0] X$

c. $[2V_0 / I_0] X$

d. $[V_0 / I_0] X$

59. The mutual conductance [klystron amplifier]

a. decreases as bunching parameter X increases

b. increases as bunching parameter X increases

c. decreases as bunching parameter X decreases

d. increases as bunching parameter X decreases

60. Power delivered by electron beam to catcher cavity is

a.

b. $V / 2R = V / 2R + V / 2R$

c. $V / 2R = V / 2R + V / 2R$

d. $V / 2R = V / 2R + V / 2R$

61. The voltage gain of klystron amplifier is

a. $G R$

b. R

c. G

d.

62. The voltage gain of klystron amplifier is

a.

b. $1/R \left[\left(\frac{V}{V_0} \right)^2 - 1 \right] R$

c. $1/R \left[\left(\frac{V}{V_0} \right)^2 - 1 \right] R$

d. $\left[\left(\frac{V}{V_0} \right)^2 - 1 \right] R G R$

63. Effective impedance of catcher cavity is

a. $1/R = 1/R + 1/R + 1/R$

b. $1/R = 1/R + 1/R$

c. $1/R = 1/R + 1/R$

d. $1/R = 1/R + 1/R$

64. The power given by the buncher cavity to produce beam bunching is

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a. $V = G / 2$

b. $V = G$

c. $V = / 2$

d. $G = / 2$

65. Loaded quality factor of catcher cavity circuit at resonant frequency is

a. $1/Q = 1/Q + 1/Q + 1/Q$

b. $1/Q = 1/Q + 1/Q$

c. $1/Q = 1/Q + 1/Q$

d. $1/Q = 1/Q + 1/Q$

66. If $V = 1000V$, then electron velocity leaving cathode in Klystron amplifier is

a. $1.88 \times 10 \text{ m/s}$

b. $2.8 \times 10 \text{ m/s}$

c. $4 \times 10 \text{ m/s}$

d. $6.8 \times 10 \text{ m/s}$

67. If $f = 3 \text{ GHz}$, $V = 1.88 \times 10$, $d = 1 \text{ mm}$, then gap transit angle in klystron amplifier is

a. 1 rad

b. 5 rad

c. 6 rad

d. 2 rad

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68. If $\theta = 1$ rad, the beam coupling coefficient in klystron amplifier is

- a. 0.952
- b. 10.1
- c. 9.52
- d. 11

69. If $f = 3$ GHz, $L = 4$ cm, $V = 1.88 \times 10^6$ m/s, then dc transit angle between cavities, in

klystron amplifier is

- a. 40 rad
- b. 50 rad
- c. 60 rad
- d. 20 rad

70. In two cavity klystron amplifier Velocity perturbation is

- a. $-C \sin(\beta z) \sin(\omega t + \theta)$
- b. $B \cos(\beta z) \cos(\omega t + \theta)$
- c. $C \cos(\beta z) \sin(\omega t + \theta)$
- d. $\sin(\beta z) \cos(\omega t + \theta)$

71. The long life klystron amplifier tube cathode is made of

- a. porous tungsten impregnated with barium, calcium & aluminium oxide.
- b. porous tungsten impregnated with copper, calcium & silicon oxide.
- c. porous tungsten impregnated with barium, copper & germanium oxide.
- d. porous tungsten impregnated with strontium, silver & aluminium oxide.

72. In two cavity klystron amplifier, charge density is

- a. $B \cos(\beta z) \cos(\omega t + \phi)$
- b. $B \cos(\omega t + \phi)$

c. $B \cos(z)$

d. $\cos(z) \cos(q)$

73. If ω is smaller than unity, beam current density is

a. $V B \cos(z - \omega t) \cos(t + \theta)$

b. $B \cos(z) \cos(t + \theta)$

c. $\cos(t + \theta)$

d. $B \cos(z)$

74. In klystron amplifier If $V = 1000V$, $X = 1.841$, $\omega = 0.952$ & $\theta = 40$, then maximum input voltage is

a. $96.5 V$

b. $9.65 V$

c. $50 V$

d. $60 V$

75. In klystron amplifier If $I = 25 \text{ mA}$, $J(x) = 0.582$, then I is

a. $29.1 \times 10^{-6} \text{ A}$

b. $2.91 \times 10^{-6} \text{ A}$

c. $9.1 \times 10^{-6} \text{ A}$

d. $3 \times 10^{-6} \text{ A}$

76. In klystron amplifier If $\omega = 0.952$, $I = 29.1 \text{ mA}$, $R = 30 \text{ K ohms}$, then

V is

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- a. 831 V
- b. 80 V
- c. 200 V
- d. 400 V

77. _____ is a five cavity klystron amplifier

- a. VA 884 D
- b. 2K 25
- c. VKC 8269
- d. 1N 29

78. The varian CW super power klystron amplifier VKC 8269 A has output power of _____ at 2.114 GHz.

- a. 500 KW
- b. 200 KW
- c. 300 KW
- d. 100 KW

79. In two cavity klystron, if $I = 0.3565$ and $R = 30$ k ohms then induced voltage in output cavity is

- a. 10.71KV
- b. 5.56KV
- c. 1.071KV
- d. 107.1KV

80. The power output by reflex klystron is

- a.
- b.
- c.
- d.

81. The retarding electric field E in reflex klystron is

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a.

b.

c.

d.

82. The ac power delivered to load by reflex klystron is

a.

b.

c.

d.

83. The electronic efficiency of reflex klystron oscillator is

a.

b.

c.

d.

84. In two cavity klystron, if $I_2 = 0.3565$ and $R = 30 \text{ k ohms}$ then power delivered to load is

a. 3.82KW

b. 38.2KW

c. 382KW

d. 0.382KW

85. Reflex klystron efficiency is

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- a. 20 to 30 %
- b. 20 to 60 %
- c. 10 to 50 %
- d. 30 to 70 %

86. The bunching parameter of reflex klystron oscillator is

- a. $V \quad / 2V$
- b. $V \quad V$
- c. $V \quad /V$
- d. $V \quad /2V$

87. The round trip transit angle referring to center of bunch is

- a. $2n\pi - \pi / 2$
- b. $2n\pi^2 - \pi / 8$
- c. $8n\pi - \pi^2 / 2$
- d. $4n\pi - \pi / 3$

88. If $n = 2$ then maximum electronic efficiency is

- a. 22.7 %
- b. 30 %
- c. 20 %
- d. 60 %

89. The electronic admittance of reflex klystron is

- a. non linear
- b. linear
- c. zero
- d. infinity

90. Represents shown in figure (a)

Figure(a)

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- a. equivalent circuit of reflex klystron
- b. equivalent circuit of klystron amplifier
- c. equivalent circuit of TWT
- d. equivalent circuit of magnetron

91. The necessary condition for oscillation in reflex klystron is

- a.
- b.
- c.
- d.

92. When signal voltage goes to zero the factor $2J_1 [X^1] / X^1$ approaches

- a. unity
- b. zero
- c. 2
- d. 10

93. The electronic admittance is a function of

- a. dc beam admittance & dc transit angle
- b. dc beam admittance & ac transit angle
- c. ac beam admittance & dc transit angle
- d. ac beam admittance & ac transit angle

94. Rectangular plot of electron admittance Y_e is

- a. spiral
- b. linear
- c. circle
- d. ellipse

95. Any value of _____ for which the spiral lies in the area to the left of line [-G-JB] will give

- a. oscillations
- b. amplification

- c. clipping
 - d. clamping
96. For oscillations in reflex klystron θ ; θ_0 is
- a. $N2\pi$
 - b. $n2\pi$
 - c. $Nn\pi$
 - d. $n6\pi$
97. For high average power purpose _ _ _ _ _ are used
- a. coupled cavity TWTs
 - b. reflex klystron
 - c. 2 cavity klystron
 - d. 3 cavity klystron
98. In TWT the microwave circuit is
- a. non resonant
 - b. resonant
 - c. complex
 - d. linear
99. The wave in TWT is
- a. propagating wave
 - b. non propagating wave
 - c. pulse only
 - d. complex
100. Represents shown in figure (a)

Figure(a)

- a. zigzag slow wave structure
 - b. helical slow wave structure
 - c. folded back line slow wave structure
 - d. inter digital slow wave structure
101. The efficiency of TWT is

- a. 20 to 40 %
 - b. 10 to 50 %
 - c. 5 to 40 %
 - d. 20 to 70 %
102. The power out put of TWT is
- a. upto 10 KW
 - b. 20KW
 - c. 50KW
 - d. 100KW
103. Represents shown in figure (a)

Figure(a)

- a. folded back line slow wave structure
 - b. helical slow wave structure
 - c. zigzag slow wave structure
 - d. inter digital slow wave structure
104. Represents shown in figure (a)

Figure(a)

- a. inter digital slow wave structure
 - b. helical slow wave structure
 - c. folded back line slow wave structure
 - d. zigzag slow wave structure
105. The interaction of electron beam and rf field in TWT IS
- a. continuous
 - b. pulsed
 - c. non continuous
 - d. complex
106. A helix TWT consists of

- a. an electron beam & slow wave structure
 - b. noise & one cavity
 - c. helix and multiple cavities
 - d. noise and electron beam
107. The slow wave structure is
- a. helical or folded back line
 - b. multiple cavities
 - c. simple tube
 - d. electron beam
108. The band width of TWT is
- a. 0.8 GHz
 - b. 10GHz
 - c. 3GHz
 - d. 20GHz
109. Power gain of TWT is
- a. upto 60DB
 - b. 20DB
 - c. 80 DB
 - d. 100DB
110. For helix type TWT
- a. v
 - b. v
 - c. v
 - d. v
111. Represents shown in figure (a)

Figure(a)

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- a. corrugated wave guide slow wave structure
 - b. helical slow wave structure
 - c. folded back line slow wave structure
 - d. zigzag slow wave structure
112. The field of slow wave structure must be distributed according to
- a. floquet's theorem
 - b. gunn effect
 - c. miller theorem
 - d. reciprocity theorem
113. In TWT the gain band width product is limited by
- a. resonant circuit
 - b. non resonant circuit
 - c. electron beam
 - d. coupled wave
114. For interaction between electrons and electric field in TWT the condition on velocity is
- a.
 - b.
 - c.
 - d.
115. If the dielectric constant is too large the efficiency of microwave device is
- a. reduced
 - b. increased by 10
 - c. increased by 30
 - d. unaffected
116. For a small pitch angle the phase velocity along the coil in free space [for helical slow wave structure] is
- a. pc / dn

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- b. pc/π
 - c. $pcd\pi$
 - d. pcd/π
117. The group velocity of wave in $w-\beta$ diagram for a helical structure is
- a. slope of curve
 - b. 10
 - c. slope of curve
 - d. 0
118. In _____ diagram of spatial harmonics for helical structure the shaded areas are
- a. forbidden regions for propagation
 - b. forbidden regions for oscillations
 - c. propagation regions
 - d. complex regions
119. In helical slow wave structure if axial phase velocity of any spatial harmonic exceeds the velocity of light then the structure
- a. radiates energy
 - b. confine energy
 - c. oscillates
 - d. amplifies
120. HULL cutoff magnetic equation is givenby
- a.
 - b. $[8V_0 m/e] / [1- (a/b)^2]$
 - c. $[8V_0 me] / b[1- (ab)^3]$
 - d. $[8V_0 m] / b[1- (a/b)^4]$
121. HULL cut off voltage equation is given by
- a.

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- b. $e B_0 \{^{2\}} b [1 - (a/b)^2]^2 / 8$
 - c. $e B_0 \{^{2\}} b [1 - (a/b)^2] / 8m$
 - d. $B_0 \{^{2\}} b^2 [1 - (a/b)^2] / 8m$
122. Out put power gain in helix type TWT is
- a. -9.54 +47.3 NC
 - b. -9.44 +40.3 NC
 - c. -9.84 +47.8 NC
 - d. -9.34 +57.3 NC
123. In magnetron whether the electron will just graze the anode & return to ward the cathode depends on
- a. V_0 & B_0
 - b. e & B_0
 - c. b^2 & m
 - d. e & b^2
124. For TWT $V_0 = 3KV$, $I_0 = 30mA$ and $Z_0 = 10$ ohms then gain parameter is
- a. 0.0292
 - b. 0.00292
 - c. 2.92
 - d. 292
125. For TWT circuit length is 50 & gain parameter is 0.0292 then output power gain is
- a. 59.52db
 - b. 49.53db
 - c. 70 db
 - d. 40.87db
126. For TWT I IS
- a.
 - b. KV

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- c. KV
- d. KV
127. For TWT P IS
- a.
- b. KV
- c. KV
- d. KV
128. The over all efficiency of coupled cavity TWT IS
- a. 20 to 55 %
- b. 20 to 69 %
- c. 10 to 80 %
- d. 30 to 70 %
129. For given B_0 if _ _ _ _ _ then the electron will not reach the anode
- a. $V_0 < V$
- b. $V_0 > V$
- c. $V_0 = V$
- d. $V_0 > 10 V$
130. IF $E/M = 1.759 \times 10$, $B_0 = 0.336 \text{ Wb/m}^2$, $a = 5 \text{ cm}$, $b = 10 \text{ cm}$ then cutoff voltage is
- a. 139.5KV
- b. 156.9KV
- c. 149.34KV

- d. 178.98KV
131. If $E/M = 1.759 \times 10$, $a = 5 \text{ cm}$, $b = 10 \text{ cm}$ $V_0 = 26\text{KV}$ then cutoff magnetic flux density is
- a. 14.495 mwb/m²
 - b. 1.4495 mwb/m²
 - c. 14.95 mwb/m²
 - d. 1.495 mwb/m²
132. If $E/M = 1.759 \times 10$ & $B_0 = 0.336 \text{ Wb/m}^2$ then cyclotron angular frequency is
- a. 5.91×10
 - b. 6.91×10
 - c. 8.91×10
 - d. 5.78×10
133. For given V_0 is _ _ _ _ _ then the electron will not reach the anode
- a. $B_0 > B$
 - b. $B_0 < B$
 - c. $B_0 < 100 \text{ B}$
 - d. $B_0 = B$
134. In magnetron there are N reentrant cavities in anode structure the phase shift between two adjacent cavities is
- a. $2\pi / N$
 - b. $2\pi / 7N$
 - c. $2\pi N$
 - d. $7\pi / N$

135. The unloaded quality factor of resonator of slow wave structure is

- a. C / G
- b. $C / L G$
- c. CL / G
- d. $C LG$

136. The external quality factor of load circuit in resonator of slow wave structure is

- a. C / G
- b. C / G
- c. CL / G
- d. $C L / G$

137. The loaded quality factor of resonant circuit is

- a. $C / [G + G]$
- b. $CL / [G + G]$
- c. $C / [G + LG]$
- d. $CL / [G L + G]$

138. The maximum circuit efficiency is obtained when magnetron is

- a. heavily loaded
- b. lightly loaded
- c. $G_L = G_r$
- d. $G_L = G_r$

139. For traveling wave high power magnetron peak power output is

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- a. 40MW
 - b. 100MW
 - c. 40KW
 - d. 70KW
140. For n type GaAs, lower valley effective mass is
- a. 0.068
 - b. 0.68
 - c. 1.2
 - d. 2
141. Beacon magnetron deliver peak output
- a. 3.5KW
 - b. 10KW
 - c. 20KW
 - d. 40KW
142. For traveling wave high power magnetron average power output is
- a. 800KW
 - b. 800MW
 - c. 400MW
 - d. 600KW
143. For traveling wave high power magnetron efficiency is
- a. 70 %
 - b. 50 %
 - c. 20 %
 - d. 90 %
144. FOR L 5080 pulse magnetron maximum peak output power is
- a. 250KW at frequency 5.45 to 5.825 GHz
 - b. 350KW at frequency 5.5 to 5.8 GHz
 - c. 450KW at frequency 5.4 to 5.82 GHz
 - d. 50KW at frequency 5.45 to 5.5 GHz
145. HULL cutoff condition determines

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- a. anode voltage or magnetic field necessary to obtain non zero anode current in the absence of electro magnetic field
 - b. anode voltage necessary to obtain zero anode current in the absence of electro magnetic field
 - c. magnetic field necessary to obtain zero anode current in the absence of electro magnetic field
 - d. anode voltage or magnetic field necessary to obtain non zero anode current in electro magnetic field
146. TED s are fabricated from
- a. GaAs
 - b. Si
 - c. Ge
 - d. SiGe
147. TEDs operate with hot electrons whose energy is
- a. very much greater than thermal energy
 - b. very much less than thermal energy
 - c. equal to thermal energy
 - d. 100
148. The origin of negative differential mobility is
- a. RWH mechanism
 - b. quantum mechanism
 - c. miller effect
 - d. gunn effect
149. For n type GaAs when electric field is beyond threshold value of 3000V/cm , the drift velocity is
- a. decreased
 - b. increased
 - c. 1000
 - d. infinity
150. Stable amplification mode is defined in the region
- a. $fL = 10^7 \text{ cm/s}$ & $n_0 L$ is between 10 & 10 / cm^2

- b. $fL = 10^8 \text{ cm/s} \& n_0 L > 10$
- c. $fL = 10^9 \text{ cm/s} \& n_0 L \text{ is between } 10 \quad \& 10$
- d. $fL = 10^9 \text{ cm/s} \& n_0 L \text{ is between } 10 \quad \& 10$
151. For n type GaAs , lower valley mobility is
- a. $8000 \text{ cm}^2 / \text{v sec}$
- b. $800 \text{ cm}^2 / \text{v sec}$
- c. $9000 \text{ cm}^2 / \text{v sec}$
- d. $1800 \text{ cm}^2 / \text{v sec}$
152. For n type GaAs , upper valley effective mass is
- a. 1.2
- b. 1.9
- c. 2.5
- d. 0.089
153. For n type GaAs , upper valley mobility is
- a. $180 \text{ cm}^2 / \text{v sec}$
- b. $800 \text{ cm}^2 / \text{v sec}$
- c. $9000 \text{ cm}^2 / \text{v sec}$
- d. $1800 \text{ cm}^2 / \text{v sec}$
154. GUNN oscillation mode is defined in the region
- a. $fL = 10^7 \text{ cm/s} \& n_0 L > 10$
- b. $fL = 10^8 \text{ cm/s} \& n_0 L > 10$
- c. $fL = 10^9 \text{ cm/s} \& n_0 L > 10$
- d. $fL = 10^9 \text{ cm/s} \& n_0 L > 10$
155. LSA mode is defined in the region
- a. $fL > 10^7 \text{ cm/s} \& n_0 / f \text{ is between } 2 \times 10^4 \& 2 \times 10^5 / \text{cm}^2$

- b. $fL = 10^8 \text{ cm/s} \& n_0 L > 2 \times 10$
 - c. $fL = 10^9 \text{ cm/s} \& n_0 / f$ is between 2×10 & 10
 - d. $fL = 10^9 \text{ cm/s} \& n_0 / f$ is between 10 & 10
156. In GaAs the formation of new domain can be prevented by
- a. decreasing voltage slightly below threshold
 - b. decreasing voltage largely below threshold
 - c. increasing voltage slightly above threshold
 - d. increasing voltage largely above threshold
157. In GUNN diode the domain length is generally
- a. inversely proportional to doping
 - b. proportional to doping
 - c. inversely proportional to twice of doping
 - d. proportional to 10 times of doping
158. In GUNN diode the domain can be detected by
- a. capacitive contact
 - b. bolometer
 - c. inductive contact only
 - d. resistive contact only
159. In GUNN oscillation mode the device is unstable because of
- a. cyclic formation of accumulation layer
 - b. partial formation high field domain
 - c. radiation
 - d. low field domain
160. Quenched domain mode efficiency is
- a. 13 %
 - b. 20 %
 - c. 30 %
 - d. 50 %

161. The avalanche multiplication factor is
- a.
 - b. $1 / [1 + [V / V_b]^n]$
 - c. $1 / [1 - [V_b / V]^n]$
 - d. $1 / [1 + [V_b / V]^n]$
162. In GUNN effect diodes(n type GaAs) the concentration of free electrons ranges from
- a. 10^{14} to 10^{17} per cm^3 at room temperature
 - b. 10^{14} to 10^{17} per cm^3 at room temperature
 - c. 10^{14} to 10^{17} per cm^3 at room temperature
 - d. 10^{14} to 10^{17} per cm^3 at room temperature
163. Efficiency of LSA mode is
- a. 20 %
 - b. 10 %
 - c. 30 %
 - d. 50 %
164. Bias circuit oscillation mode occurs when
- a. there is either GUNN or LSA oscillation
 - b. there is stable amplification mode
 - c. there is low field domain
 - d. there is radiation
165. The frequency of oscillation in GUNN oscillation mode is
- a. domain velocity / L
 - b. domain velocity L_{eff}
 - c. 10^{14} to 10^{17}
 - d. proportional to 10 times of doping

166. In GUNN oscillation mode sustaining drift velocity for GaAs is
- a. 10^7 cm / s
 - b. 10^9 cm/s
 - c. 10 cm/s
 - d. 10^4 cm/s
167. In GUNN oscillation mode efficiency is
- a. below 10 %
 - b. 20 %
 - c. below 30 %
 - d. 40 %
168. Delayed domain mode is also called as
- a. inhibited mode
 - b. GUNN oscillation mode
 - c. LAS mode
 - d. quenched mode
169. Delayed domain mode efficiency is
- a. 20 %
 - b. 10 %
 - c. 30 %
 - d. 50 %
170. AT 1.1 GHz TRAPATT pulse power is
- a. 1.2KW
 - b. 2.2KW
 - c. 3.4KW
 - d. 10KW
171. AT 0.6GHz TRAPATT efficiency is
- a. 75 %
 - b. 30 %
 - c. 20 %
 - d. 90 %

172. Represents shown in figure (a)

Figure(a)

- a. read diode
 - b. GUNN diode
 - c. tunnel diode
 - d. pin diode
173. Represents shown in figure (a)
- a. TRAPATT diode
 - b. IMPATT diode
 - c. READ diode
 - d. GUNN diode
174. IMPATT diode exhibits a differential negative resistance by
- a. impact ionization avalanche effect & transit time effect
 - b. GUNN effect & transit time effect
 - c. trapped plasma effect & early effect
 - d. miller effect & delayed domain effect
175. IMPATT diodes consists of
- a. high doping avalanche region followed by drift region
 - b. low doping avalanche region followed by drift region
 - c. medium doping avalanche region followed by drift region
 - d. high field domain
176. The efficiency of IMPATT diode is
- a. $V_A I_A / V_d I_d$
 - b. $V_A I_d / V_d I_a$
 - c. $V_d I_A / V_a I_d$
 - d. $V_A I_0 / V_d I_a$
177. GaAs IMPATT efficiency is
- a. 20 %

- b. 30 %
 - c. 40 %
 - d. 60 %
178. The avalanche zone velocity is
- a. $J / q N_A$
 - b. $Jq N_A$
 - c. $J/q V_A N_A$
 - d. $J V_A / q N_A$
179. TRAPATT mode exhibits _ _ _ _ than the IMPATT MODE
- a. higher noise figure
 - b. lower noise figure
 - c. more gain
 - d. less gain
180. Represents shown in figure (a)

Figure(a)

- a. equivalent circuit of metal semiconductor contact
 - b. equivalent circuit of transmission line
 - c. equivalent circuit of metal contact
 - d. equivalent circuit of semiconductor contact
181. The important parameter of crystal is
- a. dynamic impedance
 - b. static impedance
 - c. linearity
 - d. high field domain
182. One specific form of the thermo electric detector is
- a. bolometer
 - b. GUNN
 - c. IMPATT
 - d. TRAPATT

183. In crystal rectifiers _ _ _ _ _ determines the resistance of barrier contact & its capacity
- a. contact area
 - b. contact width only
 - c. contact length only
 - d. doping
184. The crystal detector with its nonlinear characteristics used as
- a. frequency converter
 - b. switch
 - c. oscillator
 - d. amplifier
185. Low level detector can be represented as
- a. constant current generator
 - b. constant voltage generator
 - c. Variable current generator
 - d. Variable voltage generator
186. The current sensitivity of crystal detector depends on
- a. semiconductor material & contact area
 - b. metal & contact area
 - c. contact area only
 - d. semiconductor material only
187. 1N23 used as
- a. mixer
 - b. oscillator
 - c. amplifier
 - d. thermister
188. 1N30 used as
- a. detector
 - b. oscillator
 - c. amplifier
 - d. thermister

189. Represents shown in figure (a)

Figure(a)

- a. equivalent circuit of low level rectifier in constant current form
 - b. equivalent circuit of high level rectifier in constant current form
 - c. equivalent circuit of low level rectifier in variable current form
 - d. equivalent circuit of high level rectifier in variable current form
190. 1N27 impedance is
- a. 4000 ohms
 - b. 2000ohms
 - c. 500ohms
 - d. infinity
- 191.
- a.
 - b.
 - c.
 - d.
192. IF dc current I flows through barretter the signal voltage produced is
- a. $I \beta dP$
 - b. $I dP$
 - c. $I \beta / dP$
 - d. $I / \beta dP$
193. LOSS $L =$
- a. $10 \log 1 / S^2$

- b. $10 \log S$
 - c. $10 \log 1/S_{22}^2$
 - d. $10 \log 1/S_{11}^2$
194. One form of bolometer is
- a. barretter
 - b. GUNN
 - c. IMPATT
 - d. TRAPATT
195. At the points of voltage minima and maxima the impedance is
- a. pure resistance
 - b. inductive
 - c. capacitive
 - d. zero
196. In slotted section the slot is placed as
- a. parallel to lines of current flow
 - b. perpendicular to lines of current flow
 - c. 20 degrees to lines of current flow
 - d. 70 degrees to lines of current flow
197. The probe in slotted section responds to
- a. electric fields in line
 - b. magnetic fields
 - c. magnetic fields & electric fields in line
 - d. current
198. The loop responds to
- a. magnetic fields
 - b. electric fields in line
 - c. magnetic fields & electric fields in line
 - d. voltage
199. The probe conductance G_p is called
- a. coupling coefficient

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- b. reflection coefficient
- c. vswr
- d. scattering parameter

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