

Program: BE ELECTRONICS AND TELECOMMUNICATION Engineering

Curriculum Scheme: Revised 2016

Examination: Final Year Semester VII

Course Code: ECC701 and Course Name: MICROWAVE ENGINEERING

Time: 1-hour

Max. Marks: 50

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Note to the students: - All the Questions are compulsory and carry equal marks.

Q1.	A 50 ohm lossless transmission line has a pure reactance of (j 100) ohms as its load. The VSWR in the line is
Option A:	1/2
Option B:	4
Option C:	2
Option D:	Infinity
Q2.	A transmission line is distortion less if
Option A:	$RL = 1/GC$
Option B:	$RL = GC$
Option C:	$LG = RC$
Option D:	$RG = LC$
Q3.	The capacitance per unit length and the characteristic impedance of a lossless transmission line are C and Z_0 respectively. The velocity of a travelling wave on the transmission line is
Option A:	$Z_0 C$
Option B:	$1/Z_0 C$
Option C:	Z_0/C
Option D:	C/Z_0
Q4.	In a twin – wire transmission line in air, the adjacent voltage maximum are at 12.5cm and 27.5cm. The operating frequency is
Option A:	300 MHz
Option B:	1GHz
Option C:	2 GHz
Option D:	6.28GHz
Q5.	Frequency range of X Band?
Option A:	2-4 GHz
Option B:	8-12GHz
Option C:	5-7GHz

Option D:	6-8GHz
Q6.	Give the frequency range for Hybrid Integrated circuits
Option A:	1 to 20 GHz
Option B:	30- 40 GHz
Option C:	50 – 60 GHz
Option D:	100 – 150 GHz
Q7.	Progress in _____ and other related semiconductors material processing led to the feasibility of monolithic microwave integrated circuits.
Option A:	Germanium
Option B:	GaAs
Option C:	GaAlAs
Option D:	Silicon
Q8.	Method of Deposition of Dielectric material SiO ₂
Option A:	Evaporation
Option B:	Vapor phase
Option C:	Anodization
Option D:	Deposition
Q9.	The cut-off wavelength of the dominant mode in the rectangular waveguide is
Option A:	2a
Option B:	$1/\sqrt{2a}$
Option C:	$\sqrt{2a}$
Option D:	1/2a
Q10.	The scattering matrix of a gyrator is:
Option A:	Symmetric
Option B:	Skew symmetric
Option C:	Identity matrix
Option D:	Null matrix
Q11.	In hollow waveguides, _____ wave cannot propagate
Option A:	TEM
Option B:	TE
Option C:	TM
Option D:	Hybrid
Q12.	In a hollow rectangular waveguide, the phase velocity
Option A:	Decreases with increase in frequency
Option B:	Increases with increase in frequency
Option C:	Is independent of frequency
Option D:	Vary with frequency depending on the frequency range

Q13.	The power meter is constructed from a balanced bridge circuit in which ----- of the arms is the bolometer
Option A:	One
Option B:	Two
Option C:	Three
Option D:	Four
Q14.	----- Schottky Barrier Diode is used as a square law detector whose output is proportional to the input power
Option A:	Zero biased
Option B:	Positive biased
Option C:	Negative biased
Option D:	Both positive and negative bias
Q15.	In slotted line measurement of Q which of the following component is not used
Option A:	Reflex Klystron
Option B:	Isolator
Option C:	Slotted line
Option D:	voltmeter
Q16.	Why the TWT is sometimes preferred to the multicavity klystron amplifier?
Option A:	More efficient
Option B:	has a greater bandwidth
Option C:	has a higher number of modes
Option D:	produces a higher output power
Q17.	How the frequency of oscillation in a backward wave oscillator changed?
Option A:	varying the voltage which controls beam velocity
Option B:	varying the beam current
Option C:	both by varying the beam current and by light varying the voltage which controls beam velocity
Option D:	changing the rate of thermionic emission
Q18.	If the instantaneous RF potentials on the two sides of Magnetron cavity are of opposite polarity, then in which mode will it operate
Option A:	(2π) mode
Option B:	$(\pi/4)$ mode
Option C:	(π) mode
Option D:	$(\pi/2)$ mode
Q19.	The diagram to show distance time history of electrons in klystron amplifier is called
Option A:	apple gate diagram
Option B:	asynchronous diagram
Option C:	bunching diagram

Option D:	velocity modulation diagram
Q20.	The transit time in the repeller space of a Reflex Klystron must be $n + \frac{3}{4}$ cycles to ensure that
Option A:	Returning electrons give energy to the gap oscillations
Option B:	Electrons are accelerated by the gap voltage on their return
Option C:	It is equal to the period of cavity oscillations
Option D:	The repeller is not damaged by the striking electrons
Q21.	In case of Up-converter Parametric Amplifier, gain of amplifier is _____
Option A:	$(f_s + f_p)/f_s$
Option B:	$(f_s - f_p)/f_s$
Option C:	f_p/f_s
Option D:	f_s/f_p
Q22.	Advantage of HBT over BJT is that it has
Option A:	High current gain
Option B:	High voltage gain
Option C:	High frequency of operation
Option D:	Sophisticated construction
Q23.	A certain GaAs MESFET has parameters, channel height $a = 0.1$ micrometre, Electron concentration $N_d = 8 \times 10^{17} \text{ cm}^{-3}$, relative dielectric constant = 13.10. Then pinch-off voltage is
Option A:	6.0 V
Option B:	3.2 V
Option C:	4.8 V
Option D:	7.5 V
Q24.	Parametric amplifier is a _____
Option A:	Low noise amplifier
Option B:	High gain amplifier
Option C:	Low gain amplifier
Option D:	High noise amplifier
Q25.	GaAs is used in the fabrication of GUNN diode because
Option A:	GaAs is cost effective
Option B:	It is less temperature sensitive
Option C:	It has low conduction band
Option D:	Less forbidden energy gap