Course/Branch : B.E/ECE	**Year / Semester** : IV/ VII	Format No.	NAC/TLP-07a.13
Subject Code : EC8701	**Subject Name** : Antennas and Microwave Engineering	Rev. No.	02
Unit No : 4	**Unit Name** : Passive and Active Microwave Devices	Date	30.09.2020

OBJECTIVE TYPE QUESTION BANK

S. No.	Objective Questions (MCQ /True or False / Fill up with Choices)	BTL
1	A PIN diode consists of ______number of semiconductor layers. **a) Three** b) Two c) Four d) One	L2
2	The material out of which PIN diode is made is: **a) Silicon** b) Germanium c) GaAs d) None of the mentioned	L2
3	The behavior of a PIN diode is entirely different from normal diodes at all frequency of operation. **a) True** b) False	L4
4	The junction resistance and capacitance of the intrinsic region in a PIN diode are connected______ in the equivalent circuit of PIN diode. a) Series **b) Parallel** c) Connected across package capacitance d) None of the mentioned	L5
5	When PIN diode is used as a switch, the expression for insertion loss of the switch is given by: **a) 10 log (Po/PL)** b) 10 log (PL/P0) c) 10 log (PL. P_o) d) None of the mentioned	L1
6	In the series configuration of a PIN diode switch, the terminated load impedance was found to be 50 Ω and the diode impedance was 60 Ω. Then the insertion loss of the switch is: **a) 4 dB** b) 2 dB c) 3.6 dB d) 4.8 dB	L1
7	Silicon and germanium are called ___________ semiconductors. a) direct gap **b) indirect gap** c) band gap d) indirect band gap	L2

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8	GaAs is used in the fabrication of GUNN diodes because: a) GaAs is cost effective b) It less temperature sensitive c) it has low conduction band electrons **d) less forbidden energy gap**	L1
9	The frequency of oscillation in Gunn diode is given by: **a) v_{dom}/ L_{eff}** b) L_{eff}/ V_{dom} c) L_{eff}/ WV_{dom} d) none of the mentioned	L1
10	In a Gunn diode oscillator, the electron drift velocity was found to be 107 cm/second and the effective length is 20 microns, then the intrinsic frequency is: **a) 5 GHz** b) 6 GHz c) 4 GHz d) 2 GHz	L3
11	To prevent an IMPATT diode from burning, a constant bias source is used to maintain _______ at safe limit. **a) average current** b) average voltage c) average bias voltage d) average resistance	L2
12	The number of semiconductor layers in IMPATT diode is: a) two b) three **c) four** d) none of the mentioned	L3
13	The resonant frequency of an IMPATT diode is given by: **a) $V_d/2l$** b) V_d/l c) $V_d/2\pi l$ d) $Vd_d/4\pi l$	L1
14	If the length of the intrinsic region in IMPATT diode is 2 μm and the carrier drift velocity are 10^7 cm/s, then the drift time of the carrier is: a) 10^{-11} seconds **b) 2×10^{-11} seconds** c) 2.5×10^{-11} seconds d) none of the mentioned	L1
15	If the length of the intrinsic region in IMPATT diode is 2 μm and the carrier drift velocity are 10^7 cm/s, then the nominal frequency of the diode is: a) 12 GHz **b) 25 GHz**	L2

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OBJECTIVE TYPE QUESTION BANK

	c) 30 GHz d) 24 GHz	
16	Tunnel diode can be used as an active device because___________ **a) its negative resistance region is used** b) it conducts at a faster rate c) it triggers the flow of electrons in reverse bias d) of tunnelling effect	L3
17	IMPATT diodes employ impact ionization technique which is a noisy mechanism of generating charge carriers. **a) true** b) false	L1
18	If the RMS peak current in an IMPATT diode is 700 mA and if DC input power is 6 watt, with the load resistance being equal to 2.5 Ω, the efficiency of the diode is: a) 10.1 % **b) 10.21 %** c) 12 % d) 15.2 %	L5
19	If the critical field in a Gunn diode oscillator is 3.2 KV/cm and effective length is 20 microns, then the critical voltage is: a) 3.2 V **b) 6.4 V** c) 2.4 V d) 6.5 V	L1
20	Bipolar junction transistors have _______ 1/f characteristics hence making them suitable for oscillators. a) high **b) low** c) constant d) decreasing exponential	L1
21	Silicon junction transistors are used as amplifiers at frequency range of about: a) 5-10 MHz **b) 2-10 GHz** c) 40-50 MHz d) 12-45 GHz	L2
22	with the increase in the operating frequency of a BJT, the S_{22} parameter of the transistor: a) increases **b) decreases** c) remains constant	L1

	d) none of the mentioned	
23	The hybrid-π model of a BJT is useful for analysis at all frequency ranges and variation of other transistor parameters. **a) true** b) false	L1
24	If the S_{11} and S_{22} parameters of a common emitter operated BJT is high: a) then the output and input ports are matched well **b) there is mismatch in the ports** c) the gain of the amplifier is high d) none of the mentioned	L3
25	If a common emitter configuration BJT is treated as a two port network, the gain of the amplifier is roughly given by the S parameter: a) S_{11} b) S_{12} **c) S_{21}** d) S_{22}	L2
26	Short circuit current gain of BJT is given by the expression: a) $g_m/\omega C$ b) $\omega C/ g_m$ **c) g_m/C** d) none of the mentioned	L2
27	If a transistor has a short circuit current gain of 25 and the capacitance measured in the hybrid-π model of the transistor was 60 pF. Then the threshold frequency of operation of the transistor is: a) 60 MHz b) 45.6 GHz **c) 66.3 GHz** d) 34.8 GHz	L5
28	The S_{21} parameter of a HJT increases with increase in the operating frequency of the transistor. a) true **b) false**	L2
29	Microwave tubes are grouped into two categories depending on the type of: **a) Electron beam field interaction** b) Amplification method c) Power gain achieved d) Construction methods	L1

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30	The klystron tube used in a klystron amplifier is a _________ type beam amplifier. **a) Linear beam** b) Crossed field c) Parallel field d) None of the mentioned	L1
31	he production of power at higher frequencies is much simpler than production of power at low frequencies. a) True **b) False**	L2
32	GaAs MESFET –metal semiconductor field effect transistor are one of the widely used categories of FETs. **a) true** b) false	L4
33	Advantage of using GaAs in MESFET as compared to use of silicon is: a) GaAs are cost effective **b) they have higher mobility** c) they have high resistance for flow of current in the reverse direction d) none of the mentioned	L1
34	The upper threshold frequency of an FET, where short circuit gain is unity is given by: **a) $g_m/2\ \ C_{gs}$** b) g_m/C_{gs} c) $g_m/\ 2\pi$ d) none of the mentioned	L2

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