Course/Branch : BE /ECE	**Year / Semester** : II/III	Format No.	NAC/TLP-07a.13
Subject Code :EC8391	**Subject Name** : CONTROL SYSTEMS ENGINEERING	Rev. No.	02
Unit No : 3	**Unit Name : Frequency response analysis**	Date	30.09.2020

OBJECTIVE TYPE QUESTION BANK

S. No.	Objective Questions (MCQ /True or False / Fill up with Choices)	BTL
1.	Scientist Bode have contribution in : a) **Asymptotic plots** b) Polar plots c) Root locus technique d) Constant M and n circle	L1
2.	Scientist Evans have contribution in : a) Asymptotic plots b) Polar plots c) **Root locus technique** d) Constant M and n circle	L1
3.	Scientist Nyquist have contribution in: a) Asymptotic plots b) **Polar plots** c) Root locus technique d) Constant M and n circle	L1
4.	For a stable closed loop system, the gain at phase crossover frequency should always be: a) < 20 dB b) < 6 dB c) > 6 dB d**) > 0 dB**	L3
5.	Which one of the following methods can determine the closed loop system resonance frequency operation? a) Root locus method b) Nyquist method c) Bode plot d) **M and N circle**	L1
6.	If the gain of the open loop system is doubled, the gain of the system is : a) **Not affected** b) Doubled c) Halved d) One fourth of the original value	L1
7.	Which one of the following statements is correct? Nichol's chart is useful for the detailed study of: a) **Closed loop frequency response** b) Open loop frequency response c) Close loop and open loop frequency responses d) None of the mentioned	L1
8.	Constant M- loci: a) Constant gain and constant phase shift loci of the closed-loop system. b) Plot of loop gain with the variation in frequency c) Circles of constant gain for the closed loop transfer function **d) Circles of constant phase shift for the closed loop transfer function**	L1
9.	Constant N-loci:	L3

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	a) Constant gain and constant phase shift loci of the closed-loop system. b) Plot of loop gain with the variation in frequency c) **Circles of constant gain for the closed loop transfer function** d) Circles of constant phase shift for the closed loop transfer function	
10	Nichol's chart: a) Constant gain and constant phase shift loci of the closed-loop system. b**) Plot of loop gain with the variation in frequency** c) Circles of constant gain for the closed loop transfer function d) Circles of constant phase shift for the closed loop transfer function	L1
11	The forward path transfer function of a unity feedback system is given by G(s) = $100/(s^2+10s+100)$. The frequency response of this system will exhibit the resonance peak at: a) 10 rad/sec b) 8.66 rad/sec c**) 7.07 rad/sec** d) 5rad/sec	L4
12	The critical value of gain for the system is 40. The system is operating at a gain of 20. The gain margin of the system is : a) 2 dB b) 3 dB c) **6 dB** d) 4 dB	L4
13	The open loop transfer function of a system is : G(s) H(s) =K/ (1+s) (1+2s) (1+3s) The phase crossover frequency wpc is: a) √2 **b) 1** c) Zero d) √3	L3
14	Which one of the following statements is correct for gain margin and phase margin of two closed-loop systems having loop functions G(s) H(s) and exp(-s) G(s) H(s)? a) Both gain and phase margins of the two systems will be identical b) Both gain and phase margins of G(s) H(s) will be more c**) Gain margins of the two systems are the same but phase margins of G(s) H(s) will be more** d) Phase margins of the two systems are the same but gain margin of G(s) H(s) will be less	L3
15	n a feedback control system, phase margin(PM) is 1. Directly proportional to G 2. Inversely proportional to G 3. Independent of G 4. Zero when G =0 Which of the above statements are correct? a) 1 and 2 b) 2 and 3 c) 3 and 4 **d) 1 and 4**	L4
16	The gain margin in dBs of a unity feedback control system whose open loop transfer function,	L4

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OBJECTIVE TYPE QUESTION BANK

	G(s) H(s) =1/s(s+1) is a) 0 b) 1 c) -1 **d) ∞**	
17	The loop transfer function of a system is given by G(s) H(s) =$10e^{-Ls}$/s. The phase crossover frequency is 5rad/s. The value of the dead time L is a) π/20 **b) π/10** c) -π/20 d) Zero	L4
18	The polar plot of a transfer function passes through the critical point (-1,0). Gain margin is a**) Zero** b) -1dB c) 1dB d) Infinity	L3
19	Consider the following statements: 1. The effect of feedback is to reduce the system error 2. Feedback increases the gain of the system in one frequency range but decreases in another 3. Feedback can cause a system that is originally stable to become unstable Which of these statements are correct. a) 1,2 and 3 b) 1 and 2 c**) 2 and 3** d) 1 and 3	L3
20	The open loop transfer function of a system is G(s) H(s)= K / (1+s)(1+2s)(1+3s) The phase cross over frequency ωc is a) V2 b**) 1** c) Zero d) V3	L1
21	If the gain of the open-loop system is doubled, the gain margin a) **Is not affected** b) Gets doubled c) Becomes half d) Becomes one-fourth	L1
22	The unit circle of the Nyquist plot transforms into 0dB line of the amplitude plot of the Bode diagram at a) 0 frequency b) Low frequency c) High frequency d) **Any frequency**	L1
23	Consider the following statements: The gain margin and phase margin of an unstable system may respectively be 1. Positive, positive	L3

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	2. Positive, negative 3. Negative, positive 4. Negative, negative Of these statements a) 1 and 4 are correct b) 1 and 2 are correct c) 1, 2 and 3 are correct d) **2,3 and 4 are correct**	
24	If a system has an open loop transfer function 1-s / 1+s, then the gain of the system at frequency of 1 rad/s will be a) 1 b) 1/2 c) Zero **d) -1**	L4
25	The polar plot of the open loop transfer function of a feedback control system intersects the real axis at -2. The gain margin of the system is a) -5dB b) 0dB **c) -6dB** d) 40dB	L4
26	The corner frequencies are a) 0 and 1 b) 0 and 2 c) 0 and 1 **d) 1 and 2**	L3
27	For the transfer function G(s) H(s) = 1 / s(s+1) (s+0.5), the phase cross-over frequency is a) 0.5 rad/sec **b) 0.707 rad/sec** c) 1.732 rad/sec d) 2 rad/sec	L4
28	The gain margin (in dB) of a system having the loop transfer function G(s) H(s) = 2 / s(s+1) is a) 0 b) 3 c) 6 **d) 8**	L4
29	The gain margin for the system with open loop transfer function G(s) H(s) = G(s) =2(1+s) / s2 is a) 8 **b) 0** c) 1 d) -8	L4

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OBJECTIVE TYPE QUESTION BANK

30	Assertion (A): Relative stability of the system reduces due to the presence of transportation lag. Reason (R): Transportation lag can be conveniently handled by Bode plot. a) Both A and R are true but R is correct explanation of A b) **Both A and R are true but R is correct explanation of A** c) A is true but R is false d) A is false but R is true	L3
31	Assertion (A): The phase angle plot in Bode diagram is not affected by the variation in the gain of the system. Reason(R): The variation in the gain of the system has no effect on the phase margin of the system. a) Both A and R are true but R is correct explanation of A b) Both A and R are true but R is correct explanation of A c) **A is true but R is false** d) A is false but R is true	L3
32	A system has poles at 0.01 Hz, 1 Hz and 80Hz, zeroes at 5Hz, 100Hz and 200Hz. The approximate phase of the system response at 20 Hz is : **a) -90°** b) 0° c) 90° d) -180	L4
33	The constant M-circle represented by the equation x^2+2.25x+y^2=-1.25 has the value of M equal to: a) 1 b) 2 **c) 3** d) 4	L4
34	What is the value of M for the constant M circle represented by the equation $8x^2+18x+8y^2+9=0$? a) 0.5 b) 2 **c) 3** d) 8	L4
35	In a bode magnitude plot, which one of the following slopes would be exhibited at high frequencies by a 4th order all-pole system? a**) -80dB/decade** b) -40 dB/decade c) 40 dB/decade d) 80 dB/decade	L4
36	Frequency range of bode magnitude and phases are decided by : a) The lowest and higher important frequencies of dominant factors of the OLTF b) The lowest and highest important frequencies of all the factors of the open loop transfer function c) Resonant frequencies of the second factors **d) None of the above**	L1
37	OLTF contains one zero in right half of s-plane then a) Open loop system is unstable	L1

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OBJECTIVE TYPE QUESTION BANK

	b) Close loop system is unstable c) **Close loop system is unstable for higher gain** d) Close loop system is stable	
38	The critical value of gain for a system is 40 and gain margin is 6dB. The system is operating at a gain of: **a) 20** b) 40 c) 80 d) 120	L4