

University of Mumbai
Examination 2020- Inter Cluster

Program: B.E. Instrumentation Engineering

Curriculum Scheme: Rev 2016

Examination: Second Year Semester :III

Course Code: ISC305 Course Name: Electrical Network and Measurements (ENM)(CBCGS)

Time: 2 hour

Max. Marks: 80

Q1. MCQs 40 marks

20 MCQs of 2 marks each based entire syllabus. **All the questions are compulsory**

Q2 and Q3. Subjective Questions (Total 40 marks) **20 marks each**

Either 5 marks or 10 marks sub questions will be asked with internal options.

In a few exceptional courses/subjects (as per the requirement of the subject) even a 20 mark question may be asked.

Note:

1. Internal options will be provided in the subjective questions
 2. The sub questions in Q2 and Q3 will be asked on multiple modules and based on the maximum syllabus.
 3. Referring to subjective/descriptive answers, students have to write question wise answers using paper and pen. Answers of Q2 and Q3 along with the sub questions, if any, has to be scanned, by the student appearing for the said examination, as one document (separate for Q2 and Q3) in pdf format and has to be uploaded in appropriate location of respective questions of either Google form, MS form or any other LMS.
 4. Additional 15 minutes will be provided for scanning and uploading the answers of respective questions.
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Note to the students:- All Questions are compulsory and carry equal marks .

Q1.	If there are 8 nodes in network, we can get ____ number of equations in the nodal analysis.
Option A:	9
Option B:	8
Option C:	7
Option D:	6
Q2.	In nodal analysis how many nodes are taken as reference nodes?
Option A:	1
Option B:	2
Option C:	3
Option D:	4
Q3.	In superposition theorem, when we consider the effect of one current source, all the other current sources are _____
Option A:	Shorted
Option B:	Opened
Option C:	Removed
Option D:	Undisturbed

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Q4.	Thevenin resistance is found by _____
Option A:	Shorting all voltage sources
Option B:	Opening all current sources
Option C:	Shorting all voltage sources and opening all current sources
Option D:	Opening all voltage sources and shorting all current sources
Q5.	Which of the following is also known as the dual of Thevenin's theorem?
Option A:	Norton's theorem
Option B:	Superposition theorem
Option C:	Maximum power transfer theorem
Option D:	Millman's theorem
Q6.	Norton's current is equal to the current passing through the _____ circuited _____ terminals.
Option A:	short, input
Option B:	short, output
Option C:	open, output
Option D:	open, input
Q7.	The power that is transferred to the load resistance equals the Thevenin resistance is _____
Option A:	Minimum power
Option B:	Zero power
Option C:	Maximum power
Option D:	Equal power
	Module - 2
Q8.	In Homogeneous differential equation input is equal to
Option A:	Step
Option B:	Ramp
Option C:	1
Option D:	0
Q9.	First order system is defined as :
Option A:	Number of poles at origin
Option B:	Order of the differential equation
Option C:	Total number of poles of equation
Option D:	Total number of poles and order of equation
Q10.	In time domain system, which response has its existence even after an extinction of transient response?
Option A:	Step response
Option B:	Impulse response
Option C:	Steady state response
Option D:	All of the above
	Module - 3

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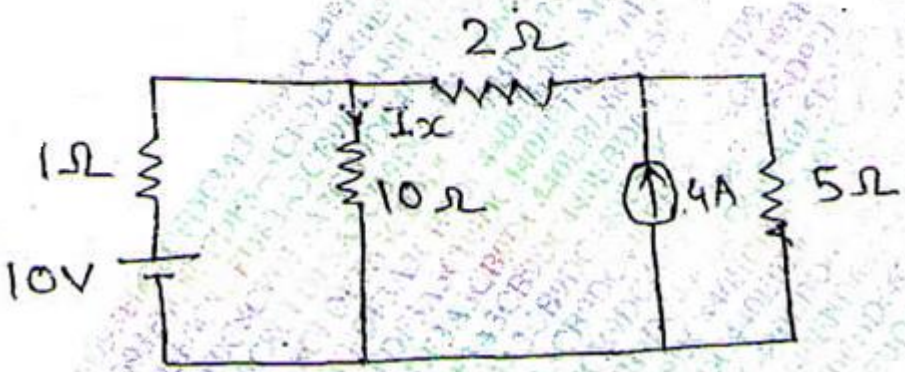
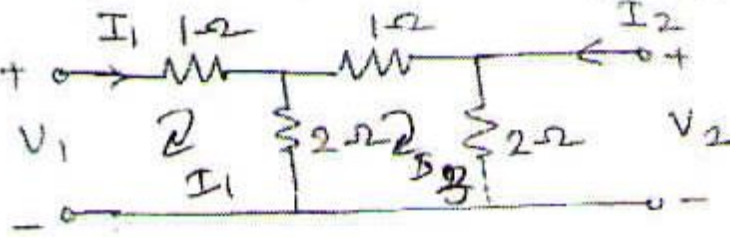
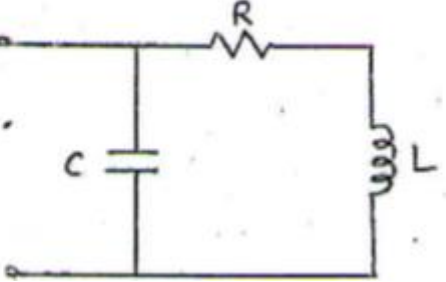
Q11.	In two-port networks the parameter h_{12} is called _____
Option A:	Short circuit input impedance
Option B:	Short circuit current gain
Option C:	Open circuit reverse voltage gain
Option D:	Open circuit output admittance
Q12.	Which is the correct condition of symmetry observed in z-parameters?
Option A:	$z_{11} = z_{22}$
Option B:	$z_{11} = z_{12}$
Option C:	$z_{12} = z_{22}$
Option D:	$z_{12} = z_{21}$
Q13.	If the two ports are connected in cascade configuration, then which arithmetic operation should be performed between the individual transmission parameters in order to determine overall transmission parameters?
Option A:	Addition
Option B:	Subtraction
Option C:	Multiplication
Option D:	Division
Q14.	Which among the following represents the precise condition of reciprocity for transmission parameters?
Option A:	$AB - CD = 1$
Option B:	$AD - BC = 1$
Option C:	$AC - BD = 1$
Option D:	None of the above
	Module - 4
Q15.	The ratio of voltage transform at first port to the current transform at the second port is called?
Option A:	Voltage transfer ratio
Option B:	Transfer admittance
Option C:	Current transfer ratio
Option D:	Transfer impedance
Q16.	The ratio of voltage transform at first port to the voltage transform at the second port is called?
Option A:	Voltage transfer ratio
Option B:	Current transfer ratio
Option C:	Transfer impedance
Option D:	Transfer admittance
Q17.	When is the system said to be causal as well as stable in accordance to pole/zero of ROC specified by system transfer function?
Option A:	Only if all the poles of system transfer function lie in left-half of S-plane
Option B:	Only if all the poles of system transfer function lie in right-half of S-plane
Option C:	Only if all the poles of system transfer function lie at the centre of S-plane
Option D:	None of the above

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Q18.	The roots of the odd and even parts of a Hurwitz polynomial P (s) lie on _____
Option A:	right half of s plane
Option B:	left half of s-plane
Option C:	on $j\omega$ axis
Option D:	on σ axis
	Module - 5
Q19.	The is an indication of the precision of the instrument used in measurement.
Option A:	Arithmetic mean
Option B:	Standard deviation
Option C:	Average deviation
Option D:	Deviation from the mean
Q20.	The degree of exactness of a measurement compared to the expected value is know as:
Option A:	Accuracy
Option B:	Resolution
Option C:	Measurement
Option D:	Precision

Q2.	Solve any four Questions out of Three	5 marks each
A	Find the value of I_1	
B	In the given network the switch is closed at $t=0$. With zero current in the inductor find $i, \frac{di}{dt}$, at $t=0^+$	

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C	<p>Find the current I_x using Superposition</p> 
D	<p>Test whether the polynomial $P(s) = s^4 + 7s^3 + 6s^2 + 21s + 8$ is Hurwitz.</p>
E	<p>Find Z parameters</p> 
F	<p>b) Determine the driving-point impedance function of a one-port network shown in following figure</p> 

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Q3.	Solve any Two Questions out of Three	10 marks each
A	Test positive realness of the function $F(s) = \frac{s^3 + 6s^2 + 7s + 3}{s^2 + 2s + 1}$	
B	Realize Foster forms of the following LC impedance function. $Z(s) = \frac{(s^2 + 1)(s^3 + 3)}{s(s^2 + 2)(s^2 + 4)}$	
C	In the network shown below determine V_a and V_b . 