	S J P N Trust's **Hirasugar Institute of Technology, Nidasoshi.** Inculcating Values, Promoting Prosperity Approved by AICTE and Affiliated to VTU Belgaum.	EEE Exam Internal Assessment Odd Sem(2018-19)

FIRST INTERNAL ASSESSMENT

Sem: III[rd] Subject: Electrical & Electronic Measurements Sub. Code: 17EE36

Date: 12/09/2018 Time: 3PM to 4PM Max. Marks: 30

Note: Answer two full questions..

Q.No		Description of Questions	Marks	CO	RBT Level
1	a	The reasonant frequency of an ac series circuit given by $f_r=1/2\Pi L^aC^b$. determine the values of a and b.	6	206.1	L_1,L_2,L_3
	b	Define sensitivity of Wheatstone bridge & derive the expression for sensitivity of bridge in terms of voltage sensitivity of galvanometer.	6	206.1	L_1,L_2,L_3
	c	Explain the sources and detectors used in ac bridges.	3	206.1	L_1,L_2
		OR			
2	*a*	With neat circuit diagram describe the operation of Maxwells inductance capacitance bridge for the measurement of inductance & Q factor.	6	206.1	L_1,L_2,L_3
	b	With neat sketch explain the operation of fall of potential method for the measurement of earth resistance.	6	206.1	L_1,L_2
	c	Explain the shielding of bridge elements in ac bridges.	3	206.1	L_1,L_2
3	a	Derive the balancing equation of kelvins double bridge.	6	206.1	L_1,L_2,L_3
	b	With neat sketch explain the operation of Megger.	6	206.1	L_1,L_2
	c	The thevenins equivalent voltage of a Wheatstone bridge is 25mv and the galvanometer current is 20μA. The resistance of the galvanometer is 50Ω. The ratio arms have resistances of 1000Ω and 5000Ω respectively. Find the value of the standard resistance for which the above conditions are satisfied. The value of the resistance to be measured ifs 600Ω.	3	206.1	L_1,L_2,L_3
		OR			
4	a	With neat sketch obtain the general equilibrium equation for ac bridges.	5	206.1	L_1,L_2,L_3
	b	Discuss the method of determining capacitance and dissipation factor using low voltage Schering Bridge.	6	206.1	L_1,L_2,L_3
	c	List out limitations of Wheatstone bridge.	4	206.1	L_1,L2

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	SJPN Trust's **Hirasugar Institute of Technology, NDS** Inculcating Values, Promoting Prosperity Approved by AICTE and Affiliated to VTU Belgaum.	E & E Dept Exam IA Scheme 2018-19 (Odd)

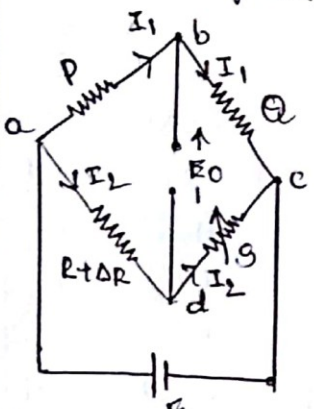
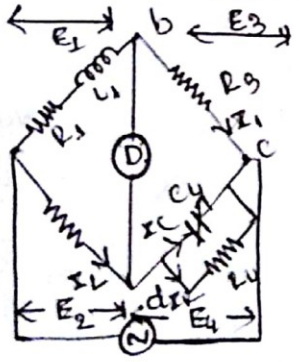
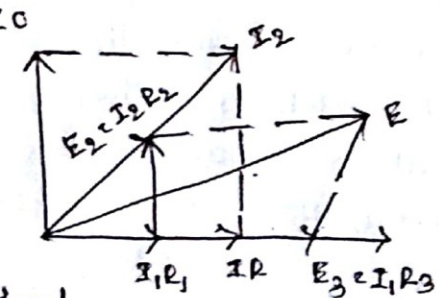
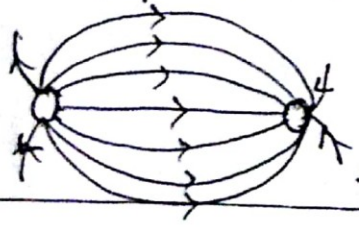
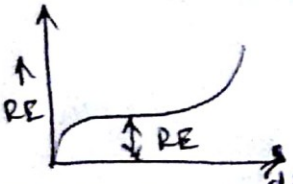
SCHEME OF EVALUATION IA - 1st

SEM: 3rd | SUBJECT: E&EM | SUBJECT CODE: 17EE36 | DATE: 12/09/18

Q.No.	Bits	DESCRIPTION	Marks	CO's
1	a	The Aeasonant frequency of an ac Series circuit is $f_r = 1/2\pi L^a C^b$, determination of the values of a & b	06	206.1
	b	defination of Sensitivity of Wheatstone bridge & deervation of Sensitivity of bridge in terms of S_v	06	206.1
	c	Explanation for Sources and detectors	03	206.1
		OR		
2	a	Neat Sketch of Maxwells Inductance bridge operation & measurement of L & Q factor of bridge	02 + 04	206.1
	b.	neat Sketch of fall of potential method & operation of fall of potential method for the measurement of earth resistance	02 + 04	206.1
	c.	Explanation for shielding of bridge elements in ac bridges	03	206.1
3	a	Derivation for balancing equation for kelvins double bridge	06	206.1
	b	neat Sketch of megger + operation of megger	02+04	206.1
	c	determination for the standard resistance value	03	206.1
4	a.	neat Sketch of ac bridge & general equilibrium equation of ac bridge	05	206.1
	b.	determination of capacitance & dissipation factor of low voltage Schering bridge	06	206.1
	c.	Limitations of Wheatstone bridge	03	206.1

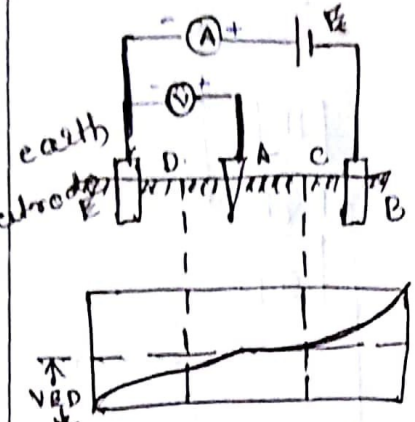
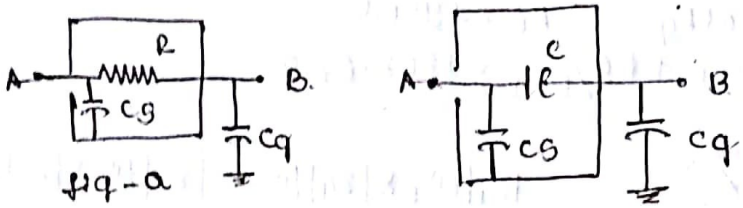
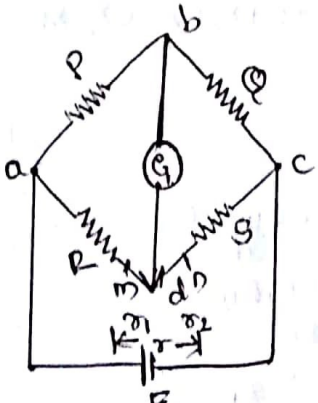
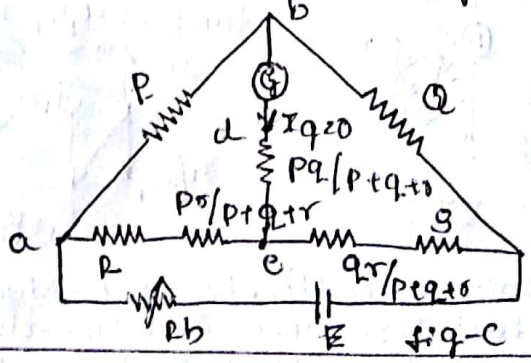
SCHEME OF EVALUATION IA - 1st

SEM: 3rd | SUBJECT: E & EM | SUBJECT CODE: 17EE36 | Page No : 02/04 | DATE: 12/09/18

Q.No.	Bits	DESCRIPTION	Marks	CO's
1)	a	$f_r = 1/2\pi L^a C^b$	06	206.1
		$[T^{-1}] = [ML^2T^{-2}I^{-2}]^a [M^{-1}L^{-2}T^4I^2]^b$		
		By solving above expression we get		
		$a = -1/2$ & $b = -1/2$ $\therefore f_r = 1/2\pi\sqrt{LC}$		
	b	Sensitivity of Wheatstone bridge $S_B = G/\Delta R/R$	06	206.1
				
		$V_{db} = E_0 = E\left[\frac{R+\Delta R}{R+\Delta R+S} - \frac{R}{R+S}\right]$		
		$E_0 = ES\Delta R/(R+S)^2$		
		$S_V = G/E_0 \Rightarrow G = S_V E_0$		
		$S_B = S_V E S R / R^2+S^2+2RS$		
	c	Explanation for sources & detectors of ac bridge	03	206.1
		OR		
2	a	Maxwell inductance capacitance bridge.	06	206.1
				
				
	b	Fall of potential method	06	206.1
		 fig-c		
				

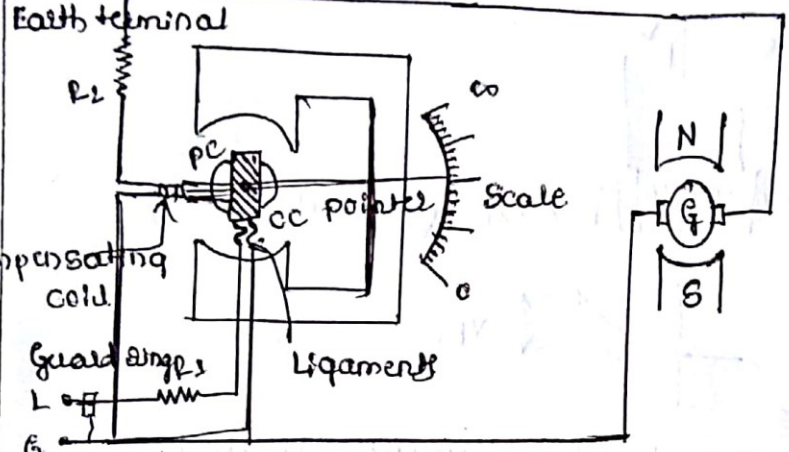
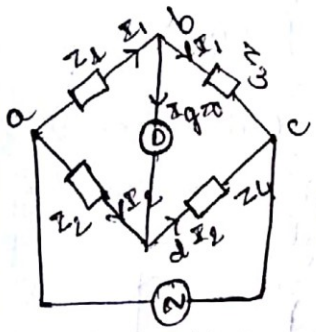
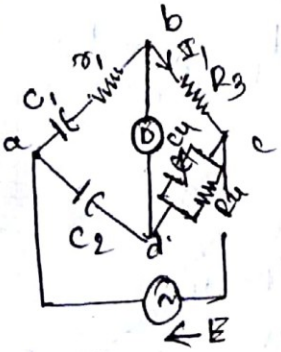
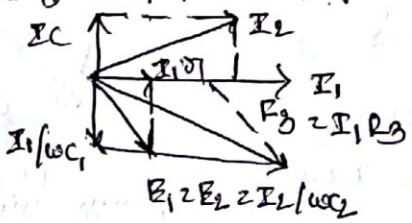
SCHEME OF EVALUATION IA - 1

SEM: 3rd | SUBJECT: E & E M | SUBJECT CODE: 17EE32 | DATE: 12/09/18

Q.No.	Bits	DESCRIPTION	Marks	CO's
				
	c	Shielding of bridge elements in ac bridges	07	206.1
		 fig-a		
3	a	Balancing equation for kelvin's double bridge	06	206.1
		 fig - kelvin's double bridge		
		$P/Q = R/S$		
		 fig-b		
		 fig-c $R = P/Q \cdot S$.		

SCHEME OF EVALUATION IA - 1 & 2

SEM: 3rd | SUBJECT: E & EM | SUBJECT CODE: 17EE32 | DATE: 12/09/18

Q.No.	Bits	DESCRIPTION	Marks	CO's
	b	Megger Earth terminal  fig- Megger.	6	206.1
	c.	$I_g = E_0/(R_0+R_g) \Rightarrow R_0 = 1950\Omega$ $R_0 = RS/(R+S) + PQ/(P+Q) = 1368.67\Omega$.	3	206.1
4	a	 $\lvert Z_1\rvert\angle\theta_1 \times \lvert Z_4\rvert\angle\theta_4 = \lvert Z_2\rvert\angle\theta_2 \times \lvert Z_3\rvert\angle\theta_3$ $R_1R_4 + j(X_1R_4 + R_1X_4) - X_1X_4$ $= R_2R_3 + j(R_2X_3 + X_2R_3) - X_2X_3$	5	206.1
	b	Low voltage Schering bridge.  $r_1 = R_3C_4/C_2$ & $C_1 = R_4/R_3 \cdot C_2$ $\tan\delta = \omega C_1 r_1 = \omega C_4 R_4$  	06	206.4
	c.	Limitations of Wheatstone bridge ① Resistance of leads ② contact Resistance ③ Thermo-electric effects		