

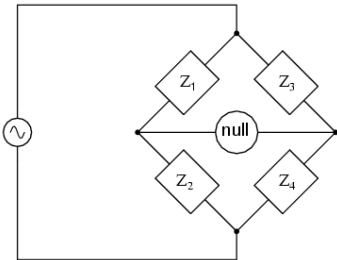
Reg.No. _____

**Karunya UNIVERSITY**(Karunya Institute of Technology & Sciences)
(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)**End Semester Examination – Nov/Dec – 2016**

Code : 14EI2041
Sub. Name : Measurements And Instrumentation

Semester : 2016-17 ODD
Duration : 3hrs
Max. marks : 100

Q. No.	Questions	Course outcome	Marks
PART-A (40X1=40 MULTIPLE CHOICE QUESTIONS)			
1.	The moving system attains a steady state position when the opposing torque equals the _____ torque	CO1	
	a. Inertia b. Deflection c. Control d. Spring		(1)
2.	PMMC instrument can be used for	CO1	
	a. D.C measurements only b. both D.C and A.C measurements c. Three phase A.C measurements d. Single phase A.C measurements		(1)
3.	At steady state or under equilibrium is _____	CO1	
	a. $T_d = T_c$ b. $T_d = 0$ c. $T_c = 0$ d. none of the answer		(1)
4.	An 0-10A ammeter has a guaranteed accuracy of 1% of full scale deflection. The limiting error while reading 2.5A is:	CO1	
	a. 1% b. 2% c. 4% d. 7%		(1)
5.	What is sensitivity?	CO1	
	a. output/input b. change in output/change in input c. $S=R/V$ d. ohms per volt reading		(1)
6.	Which one of the following is not a systematic error?	CO1	
	a. Instrumental error b. Environmental error c. Observational error d. Random error		(1)
7.	Which of the following can act as an inverse transducer?	CO1	
	a. Potentiometer b. L.V.D.T c. capacitive transducer d. Piezo electric crystals		(1)
8.	Induction wattmeter can be used in	CO1	
	a. AC circuit only b. DC circuit only c. both AC and DC circuit d. 3 phase AC only		(1)
9.	An example for null type instrument _____.	CO1	
	a. Wheatstone bridge b. Potentiometer c. a & b d. none of the answer		(1)
10.	Calculate the value of the unknown resistance of a Wheatstone bridge, assuming the bridge to be in balance condition	CO2	
	a. 21 b. 26 c. 31 d. 25		(1)

11.	Write the equation of inductance measurement using Maxwell bridge				CO2	
	a. $L_X = R_2 R_3 C_1$	b. $L_X = R_2 R_3 / R_4$	c. $L_X = Z_1 Z_2 / Z_3$	d. none of the answer		(1)
12.	The quality factor of an inductor is given as.				CO2	
	a. $Q = \omega L / R$	b. $Q = \omega R / L$	c. $Q = \omega C L R$	d. $Q = \omega L R$		(1)
13.	Mention the bridge used for measurement of inductance having low Q factor.				CO2	
	a. Schering	b. Maxwell Bridge	c. Hays	d. Desauty		(1)
14.	In figure, $Z_1 = 200 \angle 60^\circ \Omega$, $Z_2 = 400 \angle -90^\circ \Omega$, $Z_3 = 300 \angle 0^\circ$. Find Z_4 for AC bridges to be balanced				CO2	
						
	a. $Z_4 = 600 \angle -150^\circ$	b. $Z_4 = 200 \angle 60^\circ$	c. $Z_4 = 300 \angle 0^\circ$	d. $Z_4 = 900 \angle 150^\circ$		(1)
15.	Which one of the following is not an AC bridge?				CO2	
	a. Maxwell bridge	b. Desauty's bridge	c. Schering bridge	d. Wheatstone bridge		(1)
16.	Which of the following is used as detector in audio frequency ac bridges?				CO2	
	a. ac voltmeter	b. CRO	c. Head phones	d. Vibration galvanometer		(1)
17.	Thermocouples				CO2	
	a. are most commonly used temperature transducers	b. require reference junction compensation	c. have a low output voltage level	d. all the above		(1)
18.	The most effective material used in RTD for temperature measurement is				CO2	
	a. Nickel	b. Platinum	c. Copper	d. Semiconductor		(1)
19.	Commutator type tachometers can be used for				CO2	
	a. AC supply	b. DC supply	c. Both AC and DC supply	d. None of these		(1)
20.	The induction type single-phase energy meters uses				CO2	
	a. Control spring	b. Pointer	c. Brake magnet	d. All of these		(1)
21.	Which of the following are integrating instruments				CO2	
	a. ammeters	b. voltmeter	c. wattmeter	d. Energy Meter		(1)
22.	Which one is free running multivibrator?				CO2	
	a. monostable	b. bistable	c. astable	d. none of the answer		(1)
23.	Give example for astable multivibrator				CO2	
	a. Oscillators	b. square wave generators	c. both (a) & (b)	d. timer		(1)
24.	Application for bistable multivibrator?				CO2	
	a. Flip flop circuits	b. square wave generators	c. voltage controlled oscillator	d. all the answer		(1)
25.	The duty cycle for square wave generator _____				CO2	
	a. 0.5	b. 2.5	c. 3.5	d. none		(1)
26.	In a phase shift oscillator, the frequency determining elements are _____.				CO2	

	a. L and C	b. R, L and C	c. R and C	d. None of the above		(1)
27.	A Wien bridge oscillator uses _____ feedback				CO2	
	a. Only positive	b. Only negative	c. Both positive and negative	d. None of the above		(1)
28.	Multivibrators belong to the category of _____.				CO2	
	a. Square wave oscillators	b. Triangular wave oscillators	c. Ramp wave oscillators	d. Sinusoidal oscillators		(1)
29.	Barkhausen criterion for sustained oscillation gives _____				CO2	
	a. $A\beta = 1$	b. $A\beta = 0$	c. $A = \beta$	d. $A = 1/\beta$		(1)
30.	Which of these signal analysers can be used for AF applications.				CO3	
	a. Harmonic distortion analyser	b. frequency selective wave analyser	c. Power Analyser	d. Hetrodyne Wave analyser		(1)
31.	A spectrum analyzer displays received signals in the frequency domain.				CO3	
	a. True	b. False	c. none	d. not applicable		(1)
32.	Types of LCD				CO3	
	a. Dynamic scattering LCD	b. field effect LCD	c. both	d. none		(1)
33.	transmittive type cell is an example of				CO3	
	a. LCD	b. LED	c. Seven segment display	d. none		(1)
34.	Give an example of optical diode				CO3	
	a. zener diode	b. LED	c. LCD	d. none		(1)
35.	What are the types of seven segment LED?				CO3	
	a. Common anode type	b. common cathode type	c. both	d. none		(1)
36.	The _____ of a recording system is the magnitude of input voltage required to produce a standard deflection in a recorded trace.				CO3	
	a. Accuracy	b. Linearity	c. Sensitivity	d. Resolution		(1)
37.	A recorder is said to have good frequency response when the sensitivity of the system is _____ for all frequencies present in the signal				CO3	
	a. Unity	b. Zero	c. Infinity	d. Constant		(1)
38.	A chopper amplifier				CO3	
	a. Converts AC signal from low frequency to high frequency	b. Converts DC signal from low AC frequency to high frequency	c. Converts AC signal from low frequency to DC high frequency	d. Converts DC signal from low frequency to high frequency		(1)
39.	Stress and strain curves are plotted using				CO3	
	a. Magnetic tape recording	b. X-Y recording	c. Galvanometric	d. PMMC writing systems		(1)
40.	Data acquisition is the process in which, physical variables from the real world are _____				CO3	
	a. converted into electrical signals	b. modified and converted into a digital format for processing	c. both a & b	d. analog signal processing		(1)

PART B(8 X 5 = 40 MARKS) (ANSWER ANY EIGHT)

41.	Why is Damping Torque necessary in indicating instruments? Sketch the curves showing the different damping conditions.	CO1	(5)
42.	Draw the circuit of a Wheatstone bridge and derive the condition for balance. Mention the limitations of Wheatstone bridge.	CO1	(5)
43.	Describe how an unknown capacitance is measured with the help of D'Sauty's bridge.	CO1	(5)

44.	How is LVDT used in the measurement of pressure? Explain with a neat diagram.	CO1	(5)
45.	Portray the constructional diagram of Electrodynamometer type instrument used for power measurement.	CO1	(5)
46.	Describe the construction and working principle of Thermo Instruments.	CO2	(5)
47.	Draw and explain the diagram for Mono-Stable Multivibrator.	CO2	(5)
48.	Draw and explain the principle of Harmonic distortion analyser.	CO3	(5)
49.	Explain the principle and construction of Light Emitting Diode	CO3	(5)
50.	with the block diagram explain the generalized Data Acquisition System	CO3	(5)
PART C(2 X 10 = 20 MARKS) (ANSWER ANY TWO)			
51.	Describe the construction and working of PMMI instrument. Derive its torque equation.	CO1	(10)
52.	Discuss the principle of operation and construction of Single-Phase Induction Type Energy Meter with neat diagram. Discuss its advantages and disadvantages.	CO2	(10)
53.	Describe the functioning of a basic type of strip chart recorder. Explain the different types of marking mechanisms used in it.	CO3	(10)

ALL THE BEST