Register Number:……..

KUMARAGURU college of technology
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B.E DEGREE EXAMINATIONS: MAY 2017

(Regulation 2014)

Sixth Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U14ECT603**:** Measurements and Instrumentation

COURSE OUTCOMES

CO1: Recognize the evolution and history of units and standards in measurements

CO2: Identify the various parameters that are measurable in electronic instrumentation

CO3: Employ appropriate instruments to measure given sets of parameters.

CO4: Practice the construction of testing and measuring set up for electronic systems.

CO5: Relate the usage of various instrumentation standards.

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Matching type item with multiple choice code CO1 [K_1]

List I	List II
A. Hot wire	i. only voltage
B. PMMC	ii. phase
C. Electrostatic	iii. true RMS value
D. Lock in Amplifier	iv. dc value

	A	B	C	D
a)	ii	i	iii	iv
b)	iii	iv	i	ii
c)	ii	iv	iii	i
d)	iii	i	ii	iv

2. An ideal meter should have CO2 [K_2]

a) Infinite resistance
b) Finite resistance
c) Absolutely no effect on the circuit being measured
d) Definite effect on the circuit being measured

3. The relative error is the: CO1 [K_1]

1.Ratio of absolute error to the measured value of the quantity under measurement

2. Ratio of absolute error to the true value of the quantity under measurement

3. Ratio of total error to the true value of the quantity under measurement

4. Ratio of probable error to the true value of the quantity under measurement

a) 1,3 b) 1,4

c) 1,2 d) 2,3

4. The time base signal in a CRO is a CO2 [K_1]

a) Rectangular waveform b) High frequency sinusoidal wave form

c) Square wave form d) High frequency saw tooth wave form

5. Assertion (A): The LC oscillators are particularly suitable for a radio frequency range CO2 [K_2]

Reason (R): The LC oscillators can operated vey high frequency, up to several hundred MHz

a) Both A and R are Individually true and R is the correct explanation of A b) Both A and R are Individually true but R is not the correct explanation of A

c) A is true but R is false d) A is false but R is true

6. A typical frequency range of R.F generator is CO1 [K_1]

a) 50 kHz to 110 MHZ b) 50 Hz to 110 KHZ

c) 50 MHz to 110 MHz d) 50 Hz to 110Hz

7. Sequence following operation in digital voltmeter CO3 [K_1]

1.Rectification and filtration

2. Analog to digital conversion

3. Data display and recorder

4. Attenuation with phase compensation

a) 2-3-4-1 b) 1-3-2-4

c) 3-4-2-1 d) 4-1-3-2

8. The resolution of a DVM with 4 digit CO4 [K_1]

a) 1/4 b) 1/10

c) 1/1000 d) 1%

9. Assertion (A): Frequency division multiplexing is used to transmit several information simultaneously. CO2 [K_2]

Reason (R): In Frequency division multiplexing, carrier signals consist of different magnitude and same frequency.

a) Both A and R are Individually true and R is the correct explanation of A

b) Both A and R are Individually true but R is not the correct explanation of A

c) A is true but R is false

d) A is false but R is true

10. Time-Division Multiplexing (TDM) through a hierarchy of digital signals implemented by CO2 [K_1]

a) Radio Companies

b) Telephone Companies

c) Television broadcasting companies

d) internet

PART B (10 x 2 = 20 Marks)

(Answer not more than 40 words)

11. What are the basic elements of a generalized measurement system? CO1 [K_2]
12. What is meant by Dynamic characteristics? CO2 [K_1]
13. Mention the principle of dual beam oscilloscope? CO4 [K_1]
14. List out the drawbacks of tuned circuit analyzers. CO2 [K_1]
15. Give the functions of an attenuator in a signal generator. CO2 [K_2]
16. Write the applications of spectrum analyzer. CO1 [K_1]
17. Write the importance of gate time in frequency counter? CO2 [K_3]
18. How trigger time error is reduced? CO2 [K_2]
19. What are the various methods of fiber optic power measurement? CO5 [K_1]
20. Mention the single line message for interface function in IEEE488 bus system. CO4 [K_1]

Answer any FIVE Questions:-

PART C (5 x 14 = 70 Marks)

(Answer not more than 300 words)

Q.No. 21 is Compulsory

21. i) Discuss in detail about the static characteristics of a measurement system. (10) CO1 [K_2]

ii) Write a note on Units and standards of Measurement. (4)

22.	i) Derive the expression for balancing equation of Schering Bridge and draw the phasor diagram.	(7)	CO2	[K_3]
	ii) Explain the block diagram of a Sampling Oscilloscope.	(7)	CO3	[K_2]
23.	i) With a neat block diagram, explain the working of vector voltmeter.	(7)	CO3	[K_2]
	ii) Discuss in detail about the working principle of signal generator.	(7)	CO3	[K_2]
24.	i) How a spectrum analyzer can be used to operate and measure VHF? Draw the block diagram and waveforms.	(7)	CO2	[K_2]
	ii) List the various types of digital voltmeters and illustrate the working of any one type.	(7)	CO2	[K_3]
25.	i) Explain the operation of a Harmonic distortion analyzer with necessary sketch.	(10)	CO2	[K_2]
	ii) With a block diagram explain operation of a heterodyne wave analyzer.	(4)	CO2	[K_2]
26.	i) Discuss the sequence of operation in case of IEEE 488 bus with neat diagram.	(7)	CO5	[K_2]
	ii) What are the various techniques of multiplexing? Discuss any one technique in detail.	(7)	CO4	[K_2]
27.	Explain the generalized block schematic of a Digital Data Acquisition System and list out the advantages over analog data acquisition system.		CO4	[K2]

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