SARDAR PATEL UNIVERSITY
S.Y.B.Sc - IVth Semester Examination, (under CBCS)
USO4CINS02
(Calibration, Recorders, Signal Analyzers and Optical Fibre)
Monday, 8th April 2019

Time: 10.00A.M. to 01.00 P.M.　　　　　　　　　　　　　Marks: 70

Q.1　Multiple choice questions.　　　　　　　　　　　　　[10]

(1)　The ammeter and voltmeter calibration are combination of

_____.
(a) wattmeter (b) potentiometers (c) zener diode (d) resistance

(2)　Which of following instrument measure highly accurate voltage and current sources?
(a) Instrument (b) calibrators (c) voltmeters (d) potentiometers

(3)　The instrument which record changes of only one input parameters are called as _____.
(a) recorders (b) single point recorders (c) multi point recorders (d) PMMC

(4)　The _____ recorders use stepper motors to move the pens in X or Y directions.
(a) digital (b) analog (c) strip (d) chart

(5)　The modulated signal consists of a number of _____.
(a) time (b) frequencies (c) oscillations (d) distance

(6)　The FET algorithm is calculated form _____ records.
(a) Voltage (b) time (c) current (d) distance

(7)　The statement of "find data value then trace after/above address output port" is called _____ triggering.
(a) system (b) sequential (c) seven (d) solution

(8)　The high speed DSOs typically resolve single to ___ bits.
(a) 7 (b) 5 (c) 8 (d) 9

(9)　The optical fibers have no _____ components.
(a) semiconductor (b) insulator (c) metallic (d) superconductivity

(10)　The fibre optics is the technology used in _____.
(a) microwave (b) telecommunications (c) nano-technology (d) radio

Q.2　Short answer types question (Any Ten)　　　　　　　　[20]

(1)　Give any two objective for instrument calibration.

(2)　Draw the circuit diagram of dc voltmeter calibration by the use of a standard instrument.

(3)　Define: Precision resistor.

(4)　Give any two mechanisms of PMMC writing.

(5)　Draw a block diagram of X-Y recorder.

(6)　Give any two point of recorder selection.

(P.T.O.)

(7) Give any two application for FET analyzer.
(8) State the limitations of spectrum analyzer.
(9) State the advantages of fibre optics.
(10) State the area of application of fibre optics.
(11) The refractive indices of core and cladding of a fiber are 1.54 and 1.5 respectively. Calculate its numerical aperture and maximum acceptance angle.
(12) Draw the block diagram of optical communication system.

Q.3 (a) Discuss the basic Potentiometers in briefly. [06]
(b) Draw and discuss the DC voltmeter calibration method. [04]

OR

Q.3 (a) Discuss the Digital multimeter as standard instruments. [06]
(b) Write a short note on DC voltmeter potentiometer calibration. [04]

Q.4 (a) Discuss the video graphic recorders. [06]
(b) Draw a block diagram of data loggers. [04]

OR

Q.4 (a) Deduce the equation for dynamic behavior of galvanometric recorder in PMMC coil. [06]
(b) Write a short note on ultrasonic pen position sensing. [04]

Q.5 (a) Write a note on transitional sampling with effective memory depth and capturing narrow pules. [06]
(b) Explain different types of logic analyzers. [04]

OR

Q.5 (a) Draw the diagram of FFT spectrum and explain its operation. [06]
(b) Define the real-time analyzer. [04]

Q.6 What is numerical aperture? Derive an expression for numerical aperture. [10]

OR

Q.6 (a) Write a note on fibre optics sensors. [06]
(b) Define: Multimode and Single mode fibers. [04]

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