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SARDAR PATEL UNIVERSITY

S.Y.B.Sc IVth Semester Examination, (under CBCS)
USO4CINS02
(Calibration, Recorders, Signal Analyzers and Optical Fibre)
Monday, (9th April 2018)
10.00 am to 01.00 pm.

MARK :70

Q.1 Multiple choice questions. **[10]**

(1) The ammeter and voltmeter calibration are combination of _____ meter. (a) current (b) watt (c) volt (d) multi

(2) _____ measurements to measure the variable quantity as pressure.
(a) Level (b) Flow (c) Process (d) Temperature

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

(4) _____ is expressed in inches/second.
(a) velocity (b) chart speed (c) torque (d) force

(5) A transition detector can be used at the input of _____ analyzer.
(a) timing (b) vector (c) scalar (d) frequency

(6) The high-speed DSOs typically resolve signals to _____ bits.
(a) 7 (b) 8 (c) 9 (d) 16

(7) A "find data value then trace after/about address output-port" is the statement of _____ triggering.
(a) sequential (b) vector (c) don't care (d) timing

(8) The fibre optics is the technology used in _____.
(a) telecommunications (b) television (c) electronic (d) mechanical

(9) A longest incident angle is less than the critical angle, the light will be totally _____ without attenuation.
(a) reflected (b) refracted (c) polarized (d) axial

(10) The optical fiber cables are much lighter and thinner than _____ cables with the same bandwidth.
(a) Ni (b) Cu (c) Zn (d) Fe

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

(1) Draw the circuit for calibration of a wattmeter.

(2) Define: Harmonic distortion.

(3) Draw the block diagram of the distortion analyzer.

(4) Draw the block diagram of logic analyzer.

(5) State the applications of spectral analyzer.

(6) Give the disadvantages of optical fibers.

P.T.O.

(7) Define: Digital oscilloscope.

(8) Draw the block diagram of SMPTE IM analyzer.

(9) Define: Attenuation.

(10) An optical fiber has a core material of refractive index of 1.55 and cladding material of refractive index is 1.50. The light is launched into it in air. Calculate its numerical aperture.

(11) State the area of application of fibre optics.

(12) Define: Numerical aperture.

Q.3 (a) Sketch a circuit to show how a standard ammeter may be used to calibrate a dc ammeter. [5]

(b) Discuss the procedure of DC voltmeter Calibration with figure. [5]

OR

Q.3 (a) Write a note on digital multimeter as standard instruments. [5]

(b) Sketch a circuit to show how a potentiometer should be used for calibrating dc voltmeter. [5]

Q.4 (a) Write a note on PMMC galvanometer type strip chart recorder. [5]

(b) Define: DC potentiometer servo recorders. [5]

OR

Q.4 (a) Draw the schematic of a data logger and explain its operation. [5]

(b)Discuss the ultrasonic pen position sensing method. [5]

Q.5 (a) Define: Spectrum analyzer. Why is it called real-time analyzer? [5]

(b) Draw the block diagram of wave analyzer and discuss its operation. [5]

OR

Q.5 (a) Explain the construction and operation of an FFT spectrum analyzer. [5]

(b) Write a short note on transitional sampling. [5]

Q.6 (a) Distinguish between intrinsic and extrinsic attenuation. [5]

(b) Explain the application of optical fibers as sensors. [5]

OR

Q.6 (a) Derive only an expression for numerical aperture. [5]

(b) Write a note on ray theory transmission. [5]