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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.

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- (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]
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