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SARDAR PATEL UNIVERSITY
S.Y.B.Sc Fourth Semester Examination, (under CBCS)
USO4CINS02
(Calibration, Recorders, Signal Analyzers and Optical Fibre)

Tuesday, 7th April 2016

10.30 AM – 01.30 PM

Marks: 70

[10]

Q.1 Multiple choice questions.

- (1) The ammeter and voltmeter calibration are combination of _____.
(a) Instrument (c) voltmeters
(b) calibrators (d) potentiometers
- (2) In the ammeter circuits, the ammeter connecting it in _____ with a precision resistor.
(a) parallel (c) perpendicular
(b) series (d) zero
- (3) The recorders mostly are _____ device.
(a) mechanical (c) electromagnetic
(b) electrical (d) electromechanical
- (4) Which of the following is ferromagnetic material?
(a) Silicon (c) carbon steel
(b) Germanium (d) none of above
- (5) The instrument which record changes of only one input parameter are called _____ point.
(a) single (c) multi
(b) twice (d) both (a) and (b)
- (6) A modulated signal consists of a number of _____.
(a) Wavelength (c) voltage
(b) Frequency (d) current
- (7) The dynamic range is the ability of an analyzer to measure _____ signals.
(a) harmonic (c) cosine
(b) non-harmonic (d) TTL
- (8) The statement of "find data value then trace after/about address output port" is known as _____ triggering.
(a) Time (c) Don't care
(b) Sequential (d) Edge
- (9) A multimode fiber optic cable has a _____ material diameter.
(a) Semiconductor (c) insulator
(b) Metallic (d) conductor
- (10) The fibre optics data can be transmitted _____ signal.
(a) analog (c) orbital
(b) digital (d) cosine

Q.2 Short answer type questions (Attempt any ten)

- (1) Draw only circuit diagram of calibration of ohmmeter.
- (2) State any two objectives of instrument calibration.
- (3) Draw a circuit diagram of potentiometer.
- (4) Distinction between a recorder and a data logger.
- (5) The chart speed of a recording instrument is 40 mm/s. One cycle of the signal being recorded extends over 5 mm time base. Calculate the frequency of the signal.
- (6) Draw a block diagram of data logger.
- (7) Draw a block diagram of wave analyzer.
- (8) State any two application of spectrum analyzer.
- (9) Write benefits and limitation of vector analyzer.
- (10) Write the applications of fibre optics
- (11) The refractive indices of core and cladding of a fiber are 2.54 and 2.5 respectively. Calculate its numerical aperture and maximum acceptance angle
- (12) Draw the block diagram of optical communication system.

- 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** C Sketch a circuit diagram and show how a potentiometer should be used for calibrating dc voltmeter. [5]
 D Write a note on digital multimeter as standard instruments. [5]

- Q.4** A Write a note on dc potentiometer servo recorders. [5]
 B Draw the schematic of a X-Y logger and explain its operation. [5]

OR

- Q.4** C Discuss the ultrasonic pen position sensing method. [5]
 D Write a short note on PMMC writing mechanisms and draw the CRT camera optical recorder. [5]

- Q.5** A Draw the block diagram of super heterodyne analyzer and explain its operation. [5]
 B Write a short note on types of logic analyzers. [5]

OR

- Q.5** C Write a note on transitional sampling. [5]
 D Discuss the interfacing target system. [5]

- Q.6** A What is numerical aperture? Derive an expression for numerical aperture. [5]
 B Write a note on ray theory transmission. [5]

OR

- Q.6** C Discuss the application of optical fibers as sensors. [5]
 D What are the differences between intrinsic and extrinsic attenuation. [5]

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