

## BE Semester-III (Biomedical Engineering) Question Bank

### (BM-305 Electrical and Electronic Measurement)

All questions carry equal marks (10 marks)

Q.1	Explain the terms Precision & Accuracy in detail with suitable example.
Q.2	Explain the terms Resolution & sensitivity in detail with suitable example.
Q.3	Enlist & explain different types of Errors in Measurement.
Q.4	List the static characteristics of measurement system & explain in detail.
Q.5	Explain the following terms : 1) Static Error 2) Static correction 3) Scale range & Scale Span 4) Noise 5) Signal to Noise Ratio
Q.6	What do you mean by Drift? Explain types of drift with neat diagram.
Q.7	A meter reads 127.50 V and the true value of voltage is 127.43 V. Determine a) Static Error & b) Static correction for this instrument.
Q.8	A voltage has a true value of 1.50 V. An analog indicating instrument with a scale range of 0 – 2.50 V shows a voltage of 1.46 V. What are the values of absolute error and correction. Express the error as a fraction of the true value and the full scale deflection (f.s.d).
Q.9	A set of independent current measurements were recorded as 10.03, 10.10, 10.11 and 10.08 A. Calculate a) the Average Current, and b) the Range of Error.
Q.10	With neat diagram explain construction and operation of electro-dynamometer movements.
Q.11	A set of independent voltage taken by four observers was recorded as 117.02 v, 117.11 v, 117.08 v, 117.03 v. Calculate (a) the average voltage (b) the range of error.
Q.12	What are the general classes of errors? Explain in detail.
Q.13	What is watt, reactive power and apparent power? What are the drawbacks if apparent power is very large in a system?
Q.14	Define following terms: 1) Instrumental error 2) Limiting error 3) Calibration error 4) Environmental error 5) Random error 6) Probable error.
Q.15	A set of independent current measurements was taken by six observers and recorded as 12.8 mA , 12.2 mA, 12.5 mA, 13.1 mA, 12.9 mA, and 12.4 mA. Calculate arithmetic mean and the deviations from the mean.
Q.16	Draw a neat diagram of a permanent magnet moving coil meter. Also label & explain each part.
Q.17	With neat diagram explain construction and operation of D'Arsonval Galvanometer.
Q.18	How 3- phase power is measured with two wattmeters? What care should be taken during measurements?
Q.19	Draw & explain different bridge circuits for measuring capacitance.
Q.20	How frequency and input impedance of the measuring instrument effects capacitively coupled noise.
Q.21	Draw & explain different bridge circuits for measuring inductance.
Q.22	Discuss near field and farfield external interference signals.
Q.23	What is sweep? How it is generated from triggering signals? What is trigger level and trigger slope? Explain.
Q.24	In vertical deflection subsystem what is function of input coupling selector? Why signal is first attenuated and then amplified?
Q.25	Explain Wein bridge frequency meter.

Q.26	Discuss the criteria for selection of oscillator in detail.
Q.27	Explain alternate and chop mode for dual trace oscilloscope. Why chop mode is used for low frequency signals and alternate mode for high frequency signals?
Q.28	Draw actual pulse waveform as output of pulse generator. Clearly indicate Rise time, Overshoot, Settling time, Width, Fall time & Amplitude on it.
Q.29	Explain compensated probe. What will be oscilloscope picture for square wave when overcompensated and undercompensated probe is used? Why?
Q.30	Write a short note on storage oscilloscope.
Q.31	Draw & explain the basic block diagram of a general purpose oscilloscope and explain the need for a delay line.
Q.32	What is a true RMS meter? Explain the working of a thermocouple meter.
Q.33	List out important oscilloscope controls and explain the function of each.
Q.34	Explain wein bridge frequency meter and power measurement at high frequency.
Q.35	Draw the circuit diagram of a wheatstone bridge and derive the equation for balanced condition.
Q.36	Explain the basics of Kelvin double bridge for very low value resistance measurements.
Q.37	Draw the block diagram of oscilloscope subsystem.
Q.38	Explain function generator and sweep frequency generator.
Q.39	What is capacitive interference? Which techniques are used to minimize it?
Q.40	List capacitive & inductive measurement techniques & explain any one in detail.