

12. (a) Discuss the construction and working of PMMC instrument. (8 marks)
(b) A 15 V moving iron voltmeter has a resistance of $300\ \Omega$ and an inductance of 0.12 H. Assume that the voltmeter reads correctly on d.c., what will be the percentage error when the instrument is used in 15 V a.c. supply at 100 Hz.

(4 marks)

13. (a) Draw the diagram of vernier potentiometer and explain its working. (7 marks)
(b) Explain the method of measurement of resistance using Wheatstone bridge. (5 marks)

Or

14. (a) Describe with the help of suitable diagram, how a potentiometer can be used for calibration of voltmeter.

(7 marks)

- (b) Obtain the balance equations for Maxwell's inductance bridge. (5 marks)

15. (a) Explain the construction and operation of Dynamometer type wattmeter. (8 marks)

- (b) A 50 A, 230 V energymeter on full-load makes 61 revolutions in 37 seconds. If the meter constant is 520 rev/kWh, find the percentage error.

(4 marks)

Or

16. Write short notes on the following :—

(a) Electronic energymeter.

(b) Trivector meter.

(2 × 6 = 12 marks)

17. Explain the construction of current transformer. Draw its phasor diagram and obtain expressions for ratio and phase angle error.

Or

18. Explain the operation of :

(a) Electrical resonance frequency meter.

(b) Ratiometer type frequency meter.

(2 × 6 = 12 marks)

19. (a) Explain deflection systems in CRO. (8 marks)

- (b) Draw the block diagram of dual beam CRO. (4 marks)

Or

20. (a) Describe the construction and operation of Fluxmeter. (8 marks)

- (b) Draw the block diagram of dual trace CRO. (4 marks)

[5 × 12 = 60 marks]