

***B.Tech. Degree II Semester Regular/Supplementary Examination in
Marine Engineering September 2021***

**19-208-0204 BASIC ELECTRONICS AND MEASUREMENTS
(2019 Scheme)**

Time: 3 Hours

Maximum Marks: 60

(5 × 15 = 75)

- I. (a) Differentiate thermionic emission and photo electric emission. (4)
 (b) Draw and explain VI characteristics of PN junction diode under forward and reverse biased condition. (5)
 (c) Explain the Common Base (CB) configuration with its circuit diagram, input and output characteristic curve. (6)
- OR**
- II. (a) Explain the working of an NPN Transistor with necessary figures. What are the conditions for different regions of operations of a transistor? (5)
 (b) Explain the concept of feedback. What are the effects of negative feedback in transistors? (4)
 (c) Describe fixed bias circuits with diagram and all loop equations. Mention its advantages and disadvantages. (6)
- III. (a) Draw the circuit diagram of RC coupled amplifier and explain its operation, frequency response curve, 3 dB line and its significance. (7)
 (b) Explain the construction, working and characteristics of:
 (i) JFET (ii) UJT (8)
- OR**
- IV. (a) Draw the diagram and describe in detail about the working of:
 (i) Simple zener controlled voltage regulator. (4)
 (ii) Transistor series voltage regulator. (5)
 (b) Explain the different types of MOSFET along with its diagram, working and characteristics. (6)
- V. (a) Describe Barkhausen criteria? Explain in detail about RC Phase shift oscillator along with Circuit diagram, working and expression for frequency of oscillation. (9)
 (b) Explain the operation of positive biased clipper and positive biased clamper with any suitable example. (6)
- OR**
- VI. (a) Explain the working of astable multivibrator with neat diagram and applications. Comment on stable states of astable, monostable and bistable multivibrators. (9)
 (b) Explain the operation of RC integrator and differentiator with circuit diagram, equations and characteristics. (6)

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- VII. (a) What is damping? Briefly describe about different type of damping provided in an Indicating instrument. (6)
- (b) Moving coil instrument of resistance has resistance of 10Ω and gives full scale deflection when carrying a current of 50 mA. Calculate the value of series and shunt resistor to measure currents up to 100 A and voltage up to 750 V and draw the diagram. (6)
- (c) Differentiate between moving coil instruments and moving iron instruments. (3)

OR

- VIII. (a) Explain the 3 phase power measurement for a star connected load using 2 wattmeter method with circuit diagram. Derive the power equations and draw the phasor diagram. (6)
- (b) With the help of neat figures describe the working principle of single phase induction type energy meter. (5)
- (c) Describe the working of Wheatson's bridge and derive its balance equations and mention its applications. (4)
- IX. (a) Describe about the measurement of flux density in a ring specimen with diagram. (5)
- (b) With necessary diagrams explain the working principle of any one type of: (6)
- (i) Pressure transducer.
 - (ii) Temperature transducer.
- (c) Define laws of illumination. (4)

OR

- X. (a) Draw block diagram of CRO and briefly explain its components and working. (7)
- (b) With necessary diagrams describe the working of: (8)
- (i) Q meter.
 - (ii) Digital frequency meter.
