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3 (Sem–4/CBCS) PHY HC 3

2021

PHYSICS

(Honours)

Paper : PHY–HC–4036

(Analog Systems and Applications)

Full Marks : 60

Time : Three hours

***The figures in the margin indicate
full marks for the questions.***

GROUP–A

(Marks : 30)

1. (a) Write down the value of Ripple factor of a Bridge Rectifier. 1
- (b) What is the full form of LCD ? 1

Contd.

- (c) Write the expression for α (Current gain) in CB mode. 1
- (d) In Class B amplifier, where is the Q point located ? 1
- (e) Define voltage gain in decibel for an RC coupled Amplifier. 1
2. (a) What is the difference between diffusion and drift process in a pn junction ? 2
- (b) What is a Fermi level ? Where is it located in the case of pure semiconductor energy band diagram ? 2
- (c) What is a Zener diode ? Write an application of a Zener diode. 2
- (d) What are the disadvantages of a Half-wave Rectifier ? 2
- (e) Why is Self-bias method preferred ? 2

3. (a) What is a load line ? How is a load line plotted ? What is the significance of points of intersection of a load line with the curves of output characteristics of a BJT ? 5

Or

Calculate I_E and I_C of a CB circuit for which $\alpha = 0.96$ and $I_B = 50\mu A$.

- (b) Draw a circuit diagram to explain the working of a class A amplifier. 5

Or

Draw a fixed bias circuit diagram and derive an expression for its stability factor.

- (c) Explain the frequency response curve of an R-C coupled Amplifier. 5

GROUP-B

(Marks : 30)

4. (a) Obtain Diode equation expressing I-V characteristics of a *pn* junction diode. 10

Or

Explain with the help of a circuit diagram the working of a L-section filter with full-wave Rectifier. Show that the Ripple factor is independent of load resistance.

- (b) Determine Current gain, Input resistance, Voltage gain, Output resistance and Power gain of a CE transistor Amplifier in terms of h -parameter. 10
- (c) Write short notes on : **(any two)** 10
- (i) LED
 - (ii) Π – Section Filter
 - (iii) Class C Amplifier