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I Semester M.Sc. Degree Examination, June/July - 2022

PHYSICS

Electronic Circuit and Devices

(CBCS Scheme 2019-20)

Paper : PHY-104

Time : 3 Hours

Instructions to the Candidates:

Answer All the questions.



Maximum Marks : 70

1. a) Explain the terms depletion region and depletion capacitance in a pn junction. Describe their significance in the working of pn junction.
- b) Derive an expression for efficiency, current gain and response time of photo conductor. (8+7)

(OR)

2. a) Explain the construction, working principle and characteristics of MESFET.
- b) Discuss the working of SCR (10+5)
3. a) Explain the V-I characteristics of a transistor in common emitter configuration.
- b) Explain the working of voltage regulator using transistors. (8+7)

(OR)

4. a) Discuss the significance of DC load line in a transistor circuit. Describe how to draw the DC load line in CE configuration.
- b) Explain the construction and working of astable multivibrator using transistors. (7+8)
5. a) Explain the phase and frequency response of high pass filter using Op-Amp.
- b) Explain the working of Op-Amp as differentiator. (10+5)

(OR)

[P.T.O.]





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6. a) Obtain an expression for voltage gain, input impedance and output impedance of closed loop inverting op-amp.
- b) Discuss the limitations of open loop configuration

(10+5)

Answer any FIVE of the following :

(5×5=25)

7. a) Explain in brief the band structure of pn junction at thermal equilibrium.
- b) Discuss the working principle of photo diode.
- c) Write a short note on Darlington pair.
- d) Explain CMRR and difference mode gain.
- e) Discuss the working of Op-Amp as voltage follower.
- f) Simplify using Karnaugh map $F(A,B,C,D) = \sum m(1,3,4,5,10,12,13)$

