

GANPAT UNIVERSITY
B.Tech. (ME/MC/CL/EE) Sem-II
CBCS Regular Theory Examination May-June 2013
2EC101: Engineering Science

Time: 3 Hours

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Answers to the two sections must be written in separate answer books.
3. Figures to the right indicate full marks.
4. Assume suitable data, if necessary.

SECTION-I

- | | | |
|-----------|---|---|
| 1 (A) | Define Magnetization. List out types of Magnetic material and Explain Ferromagnetic material with features in detail. | 6 |
| (B) | A motor car is fitted with two horns, which differ in frequency by 288 vibrations per second. If the car sounding the horns is moving at 30 m.p.h. towards a person, who is at rest, calculate the difference of frequencies of the notes heard by him. (Velocity of sound in air is 1120ft/s). | 4 |
| (C) | Explain concept of heat and work. | 2 |
| OR | | |
| 1 (A) | Find out the core diameter necessary for single mode operation at 850 μm . Fiber have core and cladding refractive indices of 1.48 and 1.47 respectively. Find N.A. and acceptance angle also. | 4 |
| (B) | Explain Rutherford's experiment in detail with figure. | 6 |
| (C) | Define: Magnetic permeability. | 2 |
| 2 (A) | Explain classification of fiber with respect to index profile in detail | 6 |
| (B) | Define Ultrasonic. Write a short note on Piezoelectric generator. | 5 |
| OR | | |
| 2 (A) | Explain production of X-ray and list our defects of the roentgen tube. | 5 |
| (B) | What is Thermal conductivity? Derive the equation for it. | 4 |
| (C) | Define: 1) Magnetic field
2) Magnetic flux density | 2 |
| 3 (A) | List out types of thermometer and explain resistance thermometer in detail. | 6 |
| (B) | Derive Equation of N.A. | 4 |
| (C) | Write brief note on Dispersion | 2 |

SECTION II

- 4 (A) Answers the following
- (1) Describe an atom.
 - (2) How are ions formed?
 - (3) How does semiconductor differ from conductor and insulator?
 - (4) What are the condition for stiff clipper and stiff clamper circuit?
 - (5) What is covalent bond?
 - (6) What is crystal?
- (B) Explain 2nd and 3rd approximation of diode with neat sketch

OR

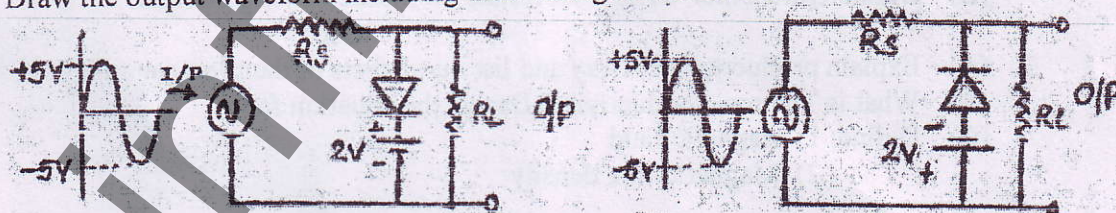
- 4 (A) Draw the V-I characteristics of diode. With the aid of figure briefly write a note on how reverse bias widens the length of depletion layer.
- (B) Calculate the load voltage, load current and diode power of following figure. Diode has a bulk resistance of 0.23Ω .
- For case 1: 1st approximation
 For case 2: 2nd approximation
 For case 3: 3rd approximation



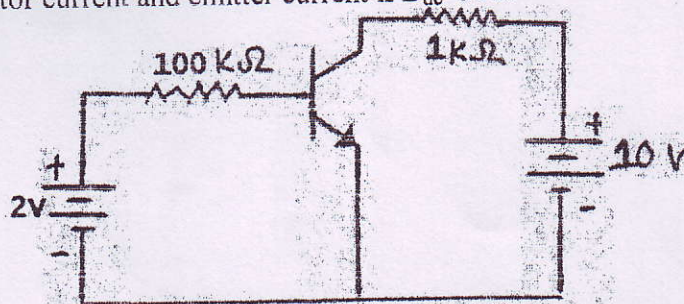
- 5 (A) Explain working of bridge rectifier with aid of circuit and waveform.
- (B) What is clamper circuit? Explain different types of clamper circuits.

OR

- 5 (A) What is the use of filter? Explain capacitor as a filter.
- (B) Draw the output waveform including their voltage level for following circuits.



- 6 (A) Sketch and explain CE configuration of n-p-n transistor.
- (B) Use the second approximation to calculate the base current for following figure. Also calculate collector current and emitter current if $\beta_{dc} = 300$.



END OF PAPER