Student Exam No._____

GANPAT UNIVERSITY

B. Tech. Sem. II (ME/MC/Civil/EE) Engineering

CBCS Regular Examination May-June 2014

2EC 101 - 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

Que-1 (A) Answer the following. 6

1. What is a conductor?
2. How does the value of barrier potential change with junction temperature?
3. What is the difference between intrinsic and extrinsic semiconductor?
4. What is an avalanche effect?
5. Draw the complete V-I Characteristics of P-N junction diode.
6. What is the need of doping?

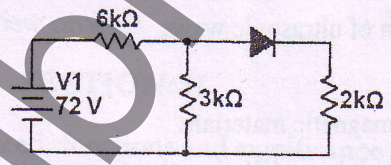
(B) Compare 1st, 2nd and 3rd approximation of diode. 6

OR

Que-1 (A) Define following terms. 6

1. Valence orbit and Valence electron
2. Surface leakage current
3. Covalent bond
4. Knee Voltage
5. Rectifier
6. Q-point

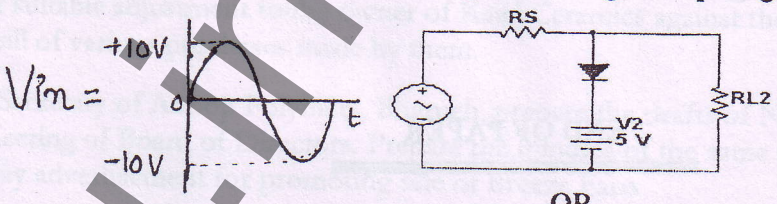
(B) Calculate the load voltage, load current and diode power of given figure. Use second approximation. 6



Que-2 (A) What is filter? Explain working of half wave rectifier with capacitor as a filter with input and output waveform. 5

(B) What is clamper? Explain any one type of clamper in detail 4

(C) Draw the output waveform of following circuit for given input signal. 2

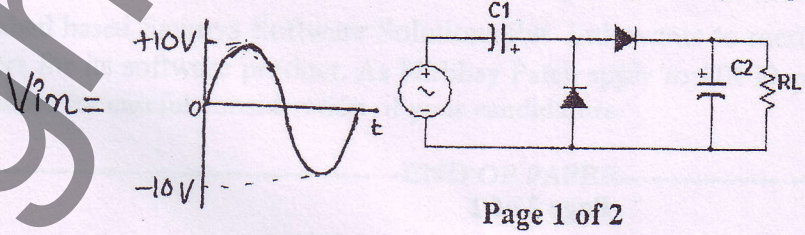


OR

Que-2 (A) Draw circuit diagram and input output waveform of bridge wave rectifier. Explain its working in detail. 5

(B) What is clipper circuit? Explain any one type of clipper in detail. 4

(C) Draw the output waveform of following circuit for given input signal. 2



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Que-3 (A) Draw the symbol of p-n-p and n-p-n transistor. Explain current and voltage relation for n-p-n CE connection. 6

(B) For CE connection of transistor considered in 2nd approximation, V_{BB}=5V, V_{CC}=10V, R_B=100kΩ, R_C=1KΩ. Determine I_B, I_C, I_E,if B_{dc}=200. 6

SECTION-II

Que-4 (A) Write short note on resistance thermometer and list out advantages and disadvantages. 6

(B) Describe types of optical fiber with respect to index profile. 6

OR

Que-4 (A) Explain thermoelectric thermometer with merits and demerits. 6

(B) Write a short note on dispersion and fiber losses. 6

Que-5 (A) If the platinum temperature corresponding to 50°C on the gas scale is 50.25°C, what will be the temperature on the platinum scale corresponding to 150°C on the gas scale? 4

(B) Explain Rutherford's scattering experiment in detail. 4

(C) Explain Conduction, convection and radiation with suitable Example. 3

OR

Que-5 (A) Two airplanes are approaching each other and their velocities are 100 and 150 miles/hr. the frequency of a note emitted by the first as heard by the passengers in the other is 1000. Calculate the true frequency of the note as heard by its own passengers. Take the velocity of sound as 750 miles/hr. 4

(B) Explain production of X-rays. 4

(C) List out the application of ultrasonic wave. 3

Que-6 (A) Write a short note on magnetic materials. 4

(B) Define Doppler's principle and derive the expression for apparent frequency for any two cases. 4

(C) Find out the core diameter necessary for single mode operation at 850μm. fibre having core and cladding refractive indices of 1.48 and 1.47 respectively. Find numerical aperture (NA) and acceptance angle (θ_0) also. 4

END OF PAPER

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