4E1232

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B. Tech. IV - Sem. (Main) Exam., May - 2019

ESC Automobile Engineering

4AE3 – 04 Digital Electronics

AE, ME

Time: 2 Hours **Maximum Marks: 80**

Instructions to Candidates:

Attempt all five questions from Part A, four questions out of six questions from Part B and two questions out of three from Part C.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used /calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL 2. NIL

PART – A

(Answer should be given up to 25 words only) **[5×2=10]**

All questions are compulsory

Q.1 Draw V-I characteristics of P-N junction diode.

Q.2 Write down difference between Half wave & Full wave rectifier.

Q.3 What do you mean by operational amplifier?

Q.4 Differentiate positive & negative feedback systems.

Q.5 Write down the difference between Half & Full adder in brief.

PART – B

(Analytical/Problem solving questions) **[4×10=40]**

Attempt any four questions

Q.1 What do you mean by multiplexer & De-multiplexer. Describe 4 -1 multiplexer & 1- 4 De- multiplexer with application.

Q.2 Describe shift left & shift right register with truth table & operation.

Q.3 Explain 4 bit Asynchronous Down counter & 4 bit Asynchronous up counter with diagram.

Q.4 Explain the need of modulation. A 400W, 1MHz carrier is amplitude-modulated with a sinusoidal signal of 2500 Hz. The depth of modulation is 75%. Calculate the sideband frequencies, bandwidth and power in sidebands and the total power in modulated wave.

Q.5 Describe BJT as a single stage CE amplifier. Write down all the necessary expressions with the circuit diagram.

Q.6 Differential gain Ad, of an op-amp measures 100. In the measurement of common mode gain experiment when 1.0V is applied common to both the inputs, output voltage measured is 0.01V. How much is common mode rejection ratio (CMRR)?

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions) **[2×15=30]**

Attempt any two questions

Q.1 Explain operational amplifier as -

(i) Inverting & Non-inverting amplifier

(ii) Summing & differences amplifier

With diagrams & necessary expressions.

Q.2 Draw a Block diagram of GSM system. Describe the cellular concepts. Also describe various blocks used in the block diagram.

Q.3 What do you mean by Zener diode? Draw V-I characteristics of Zener diode. Describe Zener diode as a regulator.

For a Zener diode A 5.0 V stabilised power supply is required to be produced from a 12V DC power supply input source. The maximum power rating P_Z of the Zener diode is 2W. Using the Zener diode regulator circuit calculate:

(a) Maximum current flowing through Zener diode.

(b) The minimum value of the series resistor R_S.
