Total No. of Questions – [3]

Total No. of Printed Pages: 04

| G.R. No. | |
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| PAPER CODE | U123-203B(REG) |
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# MAY 2023 (INSEM+ ENDSEM) EXAM

## F.Y. B. TECH. (SEMESTER - II)

## COURSE NAME: BASIC ELECTRONICS ENGINEERING

## COURSE CODE: ET10203B

## (PATTERN 2020)

Time: [2Hr] [Max. Marks: 60]

**(*) Instructions to candidates:**

1) **Figures to the right indicate full marks.**
2) **Use of scientific calculator is allowed**
3) **Use suitable data where ever required**

| Question No. | | Question Description | Marks | CO mapped | Blooms Taxonomy Level |
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| Q.1 | i) | **Solve the following**<br>If the a.c. input to a half-wave rectifier is an r.m.s value of 200/√2 volts, then diode PIV rating is------<br>-<br>a) 200/√2 V b) 400 V<br>c) 200 √2 V d) 200 V | [2] | CO1 | Apply |
| | ii) | Two LED's are connected in series along with limiting resistance. It is supplied with 10 V DC supply and drop across each LED is 2V, the value of limiting resistance for 10 mA current is-----<br><br>a) 200 Ω b) 250 Ω<br>c) 600 Ω d) 400 Ω | [2] | CO1 | Apply |
| | iii) | In RC phase shift oscillator producing output at f = 500 Hz, R = 7.5 Kohm then C = ----.<br><br>a) 0.01 micro F<br>b) 0.017 micro F<br>c) 0.012 nF<br>d) 0.001 micro F | [2] | CO1 | Apply |

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| | iv) | For single phase supply frequency of 60 Hz, output signal frequency in full wave rectifier is ----<br><br>a) 25 Hz b) 50 Hz<br>c) 120 Hz d) 200 Hz | [2] | CO1 | Apply |
| | v) | Each diode in a center-tapped full-wave rectifier is _____ -biased and conducts for _____ of the input cycle.<br><br>a) forward, 90 degree b) forward, 180 degree<br>c) reverse, 90 degree d) reverse, 360 degree | [2] | CO1 | Apply |
| | vi) | What is the average value of half wave rectifier, for Vp(out)= 50V<br>a) 21.2 V b) 15 V<br>c) 15.9 V d) 19.9 V | [2] | CO1 | Apply |
| | vii) | In Center tapped FWR, if the peak value of secondary voltage is 25 V then the peak value of the output voltage is ____<br><br>a) 24.3 V b) 11.8 V<br>c) 25.7 V d) 12.5 V | [2] | CO1 | Apply |
| | viii) | The current flowing through the Photo diode without illumination of light in reverse bias mode is called as ---------<br><br>a) reverse current b) dark current<br>c) forward current d) pinch off current | [2] | CO1 | Understand |
| | ix) | Determine value of collector current Ic, for $\beta$=180 and base current $I_B$= 340 $\mu$A.<br><br>a) 61.2 mA b) 46.8 mA<br>c) 64.5 mA d) 80.3 mA | [2] | CO2 | Apply |
| | x) | For voltage divider biasing circuit, if R1 = 18 K$\Omega$, R2 = 4 K$\Omega$, VCC=10V. What is the value of VB (voltage at Base terminal)?<br><br>a) 2.07 V b) 1.81V<br>c) 10 V d) 5.1 V | [2] | CO2 | Apply |
| | xi) | A forward potential of 10V is applied to a Si diode. A resistance of 10 K$\Omega$ is also in series with the diode. The current is---------- (Assume Si diode practical model)<br><br>a) 0.93 mA b) 10 mA<br>c) 1 mA d) 0.7 mA | [2] | CO2 | Apply |

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| | xii) | In voltage divider biasing circuit using BJT, if VE=2.42 V and RE=240 Ω , What is the value of emitter current IE?<br>a) 10 mA b) 25 mA<br>c) 20 mA d) 100 mA | [2] | CO2 | Apply |
| | xiii) | What is the total phase shift requirement for a RC phase-shift oscillator?<br>a) 90° b) 180°<br>c) 270° d) 360° | [2] | CO2 | Apply |
| | xiv) | The biasing circuit has a stability factor of 24. If due to temperature change, ICBO changes by 3 μA, then IC will change by .....<br>a) 8 μA b) 7.2 μA<br>c) 0.72 μA d) 72 μA | [2] | CO2 | Apply |
| | xv) | ix) Determine value of collector current Ic, for β=200 and base current $I_B$= 40 μA.<br>a) 8 Amp b)8000 mA<br>c) 8 mA d) 80 μA | [2] | CO2 | Apply |
| Q2 | | **Solve any three out of four questions.** | | | |
| | a) | Sketch the internal construction of an n-channel Enhancement type MOSFET and explain the pinch off process? | [5] | CO3 | Understand |
| | b) | Draw voltage divider biasing CS amplifier circuit using n channel E-MOSFET and Explain the significance of coupling and bypass capacitors connected in the circuit. | [5] | CO3 | Understand |
| | c) | Calculate $V_{GS}$ and $V_{DS}$ for the MOSFET with voltage divider bias circuit, given parameters are $R_1$ = 150 KΩ, $R_2$ = 20 KΩ, $R_D$ = 200 Ω, $V_{DD}$ = 24 V. Assume this particular MOSFET has minimum values of $I_{(on)}$ = 200 mA at $V_{GS}$ = 4 V and $V_{GS(th)}$ = 2 V. | [5] | CO3 | Apply |
| | d) | Sketch the forward characteristics of SCR for different values of gate current and explain turn on process of it. | [5] | CO3 | Understand |
| Q.3 | | **Solve any three out of four questions.** | | | |
| | a) | Explain the following terms related to a differential amplifier with necessary diagrams<br>i) Virtual ground<br>ii) Slew Rate | [5] | CO4 | Understand |

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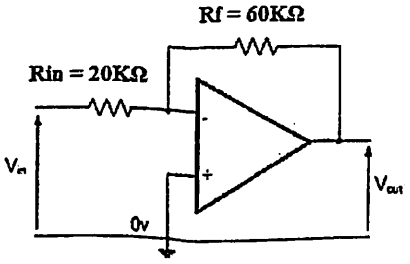
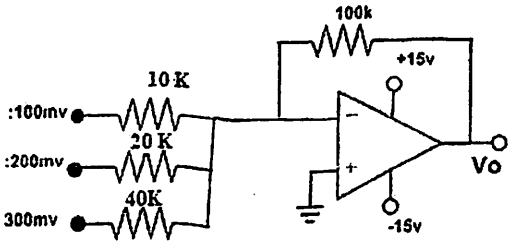
| | b) | Compare between Inverting and Non-inverting amplifier configurations of an op-amp. | [5] | CO4 | Understand |
| | c) | Calculate closed loop gain of the circuit shown below and find out its output voltage if 3V DC input is applied to the circuit.<br>  <br> | [5] | CO4 | Apply |
| | d) | If 3 input voltages 100mv; 200mv and 300mv are applied at inverting terminal. Find the output voltage.<br>  <br> | [5] | CO4 | Apply |