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ANSWER KEY

FIRST YEAR HIGHER SECONDARY EXAMINATION IMPROVEMENT October
June 2022

PART-I/II/III

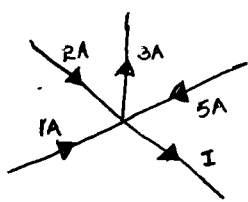
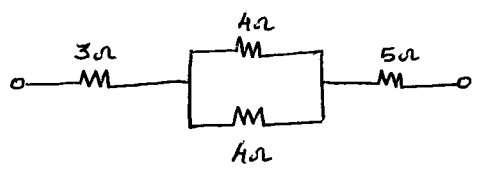
SUBJECT: ELECTRONIC SYSTEMS

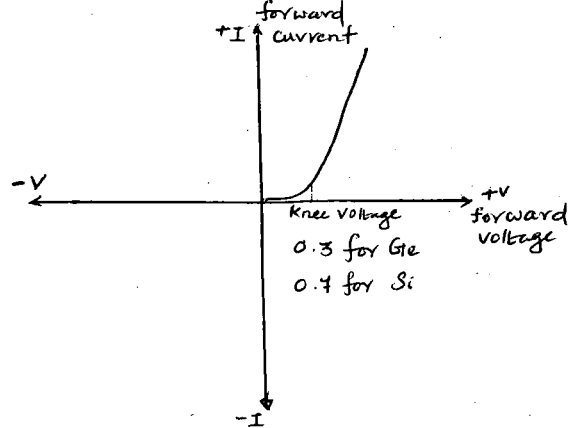

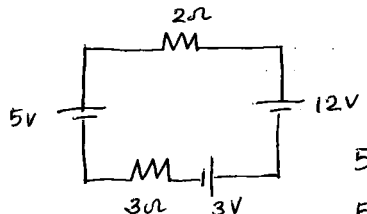
CODE NO: FY853

VERSION: C

60 SCORES

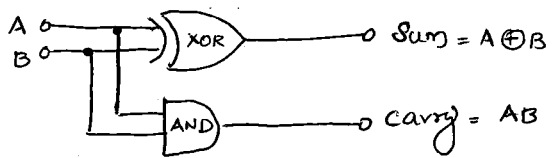
2 HOURS

| Qn. No | Sub Qns | Answer Key/Value Points | Score | Total Score |
|--------|---------|--|-------|-------------|
| 1. | | Intrinsic | 1 | 9x1=9 |
| 2. | | 5V | 1 | |
| 3. | | Saturation region | 1 | |
| 4. | | voltage | 1 | |
| 5. | | 90% | 1 | |
| 6. | | ZERO | 1 | |
| 7. | | AND | 1 | |
| 8. | | ammeter | 1 | |
| 9. | | FSK | 1 | |
| 10 | |  $1A + 2A + 5A = 3A + I$ $8A = 3A + I$ $I = 8A - 3A = 5A$ | 2 | 2 |
| 11 | |  $Ans = \text{---} \frac{3\Omega}{\text{---}} \text{---} \frac{4\Omega}{\text{---}} \frac{4\Omega}{\text{---}} \text{---} \frac{5\Omega}{\text{---}} \text{---} = \underline{\underline{10\Omega}}$ | 2 | 2 |

| Qn. No | Sub Qns | Answer Key/Value Points | Score | Total Score |
|--------|---------|--|--------|-------------|
| 12 | | Energy gap between valence band and conduction band | 2 | 2 |
| 13. | |  | 2 | 2 |
| 14. | |  , voltage regulation | 2 | 2 |
| 15 | | Need | 2 | 2 |
| 16 | | Block diagram of power supply | 2 | 2 |
| 17. | | structure of NPN transistor Marking of terminals | 1 1 | 2 |
| 18. | | Voltage divider biasing circuit circuit diagram | 1 1 | 2 |
| 19. | | (a) photodiode (b) LDR | 1 1 | 2 |
| 20 | | any two uses | 2 | 2 |
| 21 | | (a) statement (b)  $5 - 2I - 12 - 3 + 3I = 0$ $5 - 15 + I = 0$ $I = 10A$ | 1 2 | 3 |

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| Qn. No | Sub Qns | Answer Key/Value Points | Score | Total Score |
|--------|---------|---|-------|-------------|
| 22 | | (a) $22\text{ k}\Omega \pm 10\%$ (1) (b) $33\text{ k}\Omega \pm 5\%$ (1) (c) $10\ \Omega \pm 5\%$ (1) | 3 | |
| 23. | | any three comparisons | 3 | |
| 24. | | Circuit of centre tap rectifier (1½) Explanation (1½) | 3 | |
| 25. | (a) | → Current gain in CE configuration (1) OR $\alpha = \frac{I_c}{I_E}$ | 3 | |
| | (b) | $\alpha = \frac{\beta}{1+\beta}$ (1) $\beta = \frac{\alpha}{1-\alpha}$ (1) | | |
| 26. | | Three points | 3 | |
| 27. | (1) | Circuit diagram of astable (2) multivibrator output waveform (1) | 3 | |
| 28. | | Implementation of basic gates using NAND or NOR gate | 3 | |
| 29. | | Block diagram of function generator | 3 | |

| Qn. No | Sub Qns | Answer Key/Value Points | Score | Total Score |
|--------|---------|---|-------|-------------|
| 30. | (a) | any two applications (2) | 4 | |
| | (b) | $T = 1\text{ms}$ $f = \frac{1}{1 \times 10^{-3}} = 1\text{KHz} \quad (1)$ $V_{dc} = \frac{2V_m}{\pi} = \frac{0.637 \times V_m}{\pi} = 0.637 \times 5 = \underline{3.185} \quad (1)$ | | |
| 31. | (a) | mutual induction (1) | 4. | |
| | (b) | $\frac{I_s}{I_p} = \frac{N_p}{N_s}$ $\frac{I_s}{4} = \frac{1200}{1000}$ $\frac{I_s}{4} = 1.2$ $I_s = 1.2 \times 4 = 4.8\text{A} \quad (3)$ | | |
| 32. | (a) | Energy band diagram of semiconductor (1) | 4 | |
| | (b) | any three comparisons (3) | | |
| 33 | (a) | Circuit diagram (2) | 4 | |
| | (b) | output characteristics of CE configurations (2) | | |
| 34. | (a) | Circuit of RC coupled amplifier (3) | 4 | |
| | (b) | voltage divider biasing (1) | | |
| 35. | (a) | $\overline{A+B} = \bar{A} \cdot \bar{B} \quad (1)$ $\overline{A \cdot B} = \bar{A} + \bar{B} \quad (1)$ | 4 | |
| | (b) |  | (2) | |

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| Qn. No | Sub Qns | Answer Key/Value Points | Score | Total Score | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------|------------------|--|------------|------------------|------------|------|------------|------------------|---|---|---|---|------------|---|---|---|---|------|----|----|----|----|------------|---|---|----|----|------------|---|
| 36 | (a) (b) | <p>(a) 8 cells</p> <p>(b)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>$\bar{C}\bar{D}$</td> <td>$\bar{C}D$</td> <td>CD</td> <td>$C\bar{D}$</td> </tr> <tr> <td>$\bar{A}\bar{B}$</td> <td>0</td> <td>1</td> <td>1</td> <td>3</td> </tr> <tr> <td>$\bar{A}B$</td> <td>4</td> <td>5</td> <td>7</td> <td>6</td> </tr> <tr> <td>AB</td> <td>12</td> <td>13</td> <td>15</td> <td>14</td> </tr> <tr> <td>$A\bar{B}$</td> <td>8</td> <td>9</td> <td>11</td> <td>10</td> </tr> </table> <p style="text-align: center;">$Ans = \bar{C}D + CD = D(C + \bar{C}) = \underline{\underline{D}}$</p> | | $\bar{C}\bar{D}$ | $\bar{C}D$ | CD | $C\bar{D}$ | $\bar{A}\bar{B}$ | 0 | 1 | 1 | 3 | $\bar{A}B$ | 4 | 5 | 7 | 6 | AB | 12 | 13 | 15 | 14 | $A\bar{B}$ | 8 | 9 | 11 | 10 | 1 3 | 4 |
| | $\bar{C}\bar{D}$ | $\bar{C}D$ | CD | $C\bar{D}$ | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\bar{A}\bar{B}$ | 0 | 1 | 1 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | |
| $\bar{A}B$ | 4 | 5 | 7 | 6 | | | | | | | | | | | | | | | | | | | | | | | | | |
| AB | 12 | 13 | 15 | 14 | | | | | | | | | | | | | | | | | | | | | | | | | |
| $A\bar{B}$ | 8 | 9 | 11 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 37 | (a) (b) | <p>(a) Defenition (1) waveform (1)</p> <p>(b) Need for modulation any (2) two points</p> | 2 2 | 4 | | | | | | | | | | | | | | | | | | | | | | | | | |