

MAHARASHTRA STATE BOARD OF VOCATIONAL EXAMINATIONS, MUMBAI

Examination, July 2014

CERTIFICATE COURSE IN ELECTRONIC ASSEMBLY AND T. V. MAINTENANCE

[ἑἶς—3 ἰἑῶῆ]

(BEÚÉ NÖÉ—100)

$$E_{\text{eff}} = E_0 + \frac{1}{2} \left(\frac{E_0}{E_0 + E_1} \right) \left(\frac{E_0}{E_0 + E_1} \right) \left(\frac{E_0}{E_0 + E_1} \right) \quad (E_0 + E_1)^{-1}$$

◦ÉÉxÉÉ.—(1) ◦ÉÉÇ |É¶xÉ ◦ÉÉbÉÉhÉä +ÉÉ¶ÉÉà.

(2) $= \nabla \epsilon^i \epsilon^j \partial_b \theta_{\pm}^i + \epsilon^j \{ \theta_{\pm}^i \epsilon^k \partial_b \theta_{\pm}^i \} n^j \epsilon^k \epsilon^i \epsilon^i \epsilon^i.$

$$(3) \quad +E\Gamma^{\text{af}}E_0 \ i^{\text{af}}E \ E^{\text{af}}E_0 +E\Gamma^{\text{bf}}E_0 \ E^{\text{bf}}E = kE^{\otimes a} \{E^{\otimes c} \ E_0^{\otimes b}\}.$$
NÍRÉ

1. (+) $\text{E}^{\text{®}}\text{E}^{\text{®}}\text{a}^{\text{®}}\text{E}^{\text{®}}\text{VÉÉÉÉ} \text{E}^{\text{®}}\text{E}^{\text{®}} (\text{E}^{\text{®}}\text{E}^{\text{®}}\text{E}^{\text{®}}\text{E}^{\text{®}}\text{E}^{\text{®}}) \{\text{E}^{\text{®}}\text{E}^{\text{®}}\} :-$

5

[illegible]

(2) $\{E_i E_j^{R_i} \frac{1}{2} \} \dots\dots\dots S E E M E E E d^{R_i} + E \frac{1}{2}$

(3)[®] 77E8XOE+EE +PE()[®] [®] 77E8XOE 1/2PEIEIE.

(4) $\mathbb{E}^{\mathbb{O}(\mathbb{R})}[\mathbb{O}V] + \mathbb{E}^{\mathbb{O}(\mathbb{R})}[\mathbb{O}]\mathbb{O}uEvLaZ\mathbb{O}(\mathbb{R})\mathbb{O}J\mathbb{O} \dots \mathbb{O}q\mathbb{E}\mathbb{E}a$

[illegible]

(6) L.D.R. S&A^oE{ie^oü{E +E½d

(-f0) JfE+É0 Énè+Éä^aÉÉ ®[®]IVÉ^o]ã^oÉSÉä Éò+É[®]ÉäÉb÷ É+É1/2 :-

5

(1) $10 \text{ K } \Omega \pm 10\%$

(2) $10 \text{ E} \pm 5\%$

(3) $22 \Omega \pm 20\%$

(4) $1 \text{ M } \Omega \pm 5\%$

(5) $4.7 \text{ K } \Omega \pm 10\%$.

(Eò) SÉÚàí Eò ð[®] Ú[®] i Éä Ê±Ê½ :—

10

[illegible]

(2) $\frac{1}{2} \frac{d^2 x}{dt^2} + \frac{1}{2} \frac{d^2 y}{dt^2} = 0$ DC $\frac{1}{2} \frac{d^2 x}{dt^2} + \frac{1}{2} \frac{d^2 y}{dt^2} = 0$ 230V/50Hz $\frac{1}{2} \frac{d^2 x}{dt^2} + \frac{1}{2} \frac{d^2 y}{dt^2} = 0$

[illegible]
$$(4) \quad E_0(\vec{E} \cdot \vec{E}) = \frac{1}{2} \rho_{DC} \nabla^2 \phi + \frac{1}{2} \epsilon_0 \nabla^2 \phi + \frac{1}{2} \epsilon_0 \nabla^2 \phi$$
[illegible]
$$(6) \quad \left[\frac{1}{2} \mathbf{E}^{\otimes 2} \right]_{\mathbb{R}} \left[\frac{1}{2} \mathbf{B}^{\otimes 2} \right]_{\mathbb{R}} \leq \mathbf{E} \otimes \mathbf{E} \otimes \mathbf{E} + \frac{1}{2} \mathbf{E}$$
$$(7) \quad b_{\frac{1}{2}}^{\text{faff}} \div \frac{1}{2}b + C \left(\frac{1}{2}b \right) E_0 \{ \text{faff} \} \bar{0} + \frac{1}{2}b$$

(8) PNP [xZ^o]Pu½ NPN [xZ^o]C6EE BāVEØ EE[@]UEE aEe xEE½D.

$$(9) \quad E_{\alpha}^{\pm} E_{\alpha}^{\pm} = E_{\alpha}^{\pm} + \hat{1}'' \{ \pm \epsilon; \alpha^{\pm} \} E_{\alpha}^{\pm} \quad \left[\frac{1}{2} \alpha^{\pm} \right] \text{ if } M_{\alpha}^{\pm} = 1 + \epsilon \frac{1}{2} \alpha^{\pm}$$
$$(10) \quad {}^{\circ}\hat{E}^{ae}G\partial_a d_x E \frac{1}{2} b \left\{ \hat{E}^o E \frac{1}{2} b \right\} \delta < \langle \hat{E} \rangle \hat{M} x Z E^o \Big] \theta u + E \frac{1}{2} b$$

2. JEE+EO+E(EE)ò nññ |É|xÉ °ÉÉb:ÉÉ :-

16

(+) + ÉxpÉÉEÉ ÉxÉ^aÉÉ °{É]õ Èõ®É.

(㉔) {ÉÉäîx¶É+ÉäÉÒ}®§ÉÒ®§ÉxÉÉ°{É¹}õÉò®ü.

(Eò) + ÉÉbÉÈS^aÉÉ^oÉ¹/₂^{aa}ÉÉÉ^a ÉÉ^ab[®]ÉÉ + É^aÉÉÉÉ[®]ÉÉÉÉ^o{É¹}óÉó[®]É.

(ENGLISH)

[TIME ALLOWED — 3 HOURS]

(MARKS — 100)

BASIC ELECTRONICS AND ASSEMBLY TECHNIQUE (THEORY-I)*Instructions.*—(1) All questions are *compulsory*.(2) Figures to the right indicate *full* marks.

(3) Illustrate your answer with neat sketches wherever necessary.

- | | Marks |
|---|--------------|
| 1. (A) Fill in the blanks (any <i>five</i>) :— | 5 |
| (i) The electric current is measured in | |
| (ii) Power is the product of | |
| (iii) The resonance is known as Acceptor resonance. | |
| (iv) In series Ohm meter zero deflection indicates | |
| (v) Sensitivity of multimeter is given in terms of | |
| (vi) LDR stands for | |
| (B) Write colour code for given resistance values :— | 5 |
| (i) $10\text{ K } \Omega \pm 10\%$ (ii) $10\text{ E } \pm 5\%$ (iii) $22\text{ } \Omega \pm 20\%$ | |
| (iv) $1\text{ M } \Omega \pm 5\%$ (v) $4.7\text{ K } \Omega \pm 10\%$. | |
| (C) State the following statements <i>true</i> or <i>false</i> :— | 10 |
| (i) In parallel circuit current through each resistor is same. | |
| (ii) Mains supply in India is DC type and it is 230 volt/ 50 Hz. | |
| (iii) Frequency is measured in Hertz. | |
| (iv) Capacitor is a DC short and AC open. | |
| (v) Transformer can be operated on DC. | |
| (vi) Trimmer is a variable types of capacitor. | |
| (vii) Diode is an active component. | |
| (viii) PNP transistor cannot be used in place of NPN transistor. | |
| (ix) Common base amplifier has voltage gain of 1. | |
| (x) Microphone is passive types of transducer. | |
| 2. Solve any <i>two</i> of the following :— | 16 |
| (a) State and explain Ohm's Law. | |
| (b) Describe construction of potentiometer. | |
| (c) With the help of neat diagram describe construction of soldering iron. | |

[Turn over]

3. Write short notes on any *five* of the following. :— 16
- (a) Laser diode (b) NPN transistor
(c) Photo cell (d) Telephone
(e) Microphone (f) Intrinsic Semiconductor.
4. Attempt any *three* of the following :— 16
- (a) State and explain Kirchoff s current and voltage law.
(b) What do you mean by self inductance & mutual inductance ?
(c) What is transducer ? Give various types of transducer according to its working principle and Explain any one in short.
(d) Draw a circuit diagram of Bridge rectifier and explain its working , Draw input and output waveforms.
(e) What is principle of oscillator ? Explain in short any one types of oscillator.
5. Attempt any *two* of the following :— 16
- (a) Enlist the types of Resistor & explain carbon composition resistor in details.
(b) On what principle transformer work? Explain working & describe its types.
(c) What is mean by polar and non-polar capacitor ? Explain Electrolytic capacitor in details.
6. Attempt any *two* of the following :— 16
- (a) On what principle multimeter work ? Explain construction and working of multirange ammeter using basic galvanometer.
(b) Give comparison between CB, CC, CE amplifier.
(c) What do you understand about regulated power supply ? Explain IC regulator power supply with the help of neat diagram.
-