

MAHARASHTRA STATE BOARD OF SKILL DEVELOPMENT EXAMINATION, MUMBAI

Examination—July, 2020

ADVANCE DIPLOMA IN INDUSTRIAL SAFETY

[~~ἑ~~ύ—3 iέέ°έ]

(BEÜÉ MÖÉ—100)

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°ΕΞΕΛΕ.— (1) °Ε Ής | Εϣ | ΧΕ + ΕΧΕ Ή°Ες + Ε½ϣΕ.

$$(2) \quad +\{E+E_0=kE^{\otimes} \circ \{F\} \circ E_0^{\otimes} VEA_0 + E^{\otimes} EA_0 iEA_0 xE_0^{\otimes} \circ E^{\otimes} E^{\otimes} E^{\otimes}$$
[illegible]

(4) $+E_{\parallel}^{\text{a}} E_0 + O_{\perp}^{\text{a}} E_0^2$ **ΕΠΙΣΤΗΜΟΝΙΚΟ ΜΕΤΡΩ** $V_{\text{E}}^{\text{R}} \text{U.}$

NÉÉ

1. $\hat{E} \left[\frac{\partial \hat{E}}{\partial \theta} \right] (E \frac{\partial \hat{E}}{\partial \theta})^T S E^R) : -$

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(+) $\text{NE}^{\oplus}\text{U}^{\oplus} \text{U}^{\oplus} + \text{E}^{\oplus}\text{E}^{\oplus} \text{E}^{\oplus} \text{E}^{\oplus} \text{E}^{\oplus}.$

(d) $S_{EE} + E_U + O_E + E_A^{aEE} \in \{O_{ES}, EE, EE\}^{\otimes U}$

(Eò) ^aÉÉÉÉÉò °ÉÉÉÉÉÉÉä iÉi É.

[illegible][illegible]

2. {EÖ0+E MÉA}Ø °É'ÉVÉE'ÉMÉ °ÉÉMÉE (EöéhÉI^aÉE½Þ nÜÉ) :—

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(+) "É¹É²É³É⁴É⁵É⁶É⁷É⁸É⁹É¹⁰É¹¹É¹²É¹³É¹⁴É¹⁵É¹⁶É¹⁷É¹⁸É¹⁹É²⁰É²¹É²²É²³É²⁴É²⁵É²⁶É²⁷É²⁸É²⁹É³⁰É³¹É³²É³³É³⁴É³⁵É³⁶É³⁷É³⁸É³⁹É⁴⁰É⁴¹É⁴²É⁴³É⁴⁴É⁴⁵É⁴⁶É⁴⁷É⁴⁸É⁴⁹É⁵⁰É⁵¹É⁵²É⁵³É⁵⁴É⁵⁵É⁵⁶É⁵⁷É⁵⁸É⁵⁹É⁶⁰É⁶¹É⁶²É⁶³É⁶⁴É⁶⁵É⁶⁶É⁶⁷É⁶⁸É⁶⁹É⁷⁰É⁷¹É⁷²É⁷³É⁷⁴É⁷⁵É⁷⁶É⁷⁷É⁷⁸É⁷⁹É⁸⁰É⁸¹É⁸²É⁸³É⁸⁴É⁸⁵É⁸⁶É⁸⁷É⁸⁸É⁸⁹É⁹⁰É⁹¹É⁹²É⁹³É⁹⁴É⁹⁵É⁹⁶É⁹⁷É⁹⁸É⁹⁹É¹⁰⁰É¹⁰¹É¹⁰²É¹⁰³É¹⁰⁴É¹⁰⁵É¹⁰⁶É¹⁰⁷É¹⁰⁸É¹⁰⁹É¹¹⁰É¹¹¹É¹¹²É¹¹³É¹¹⁴É¹¹⁵É¹¹⁶É¹¹⁷É¹¹⁸É¹¹⁹É¹²⁰É¹²¹É¹²²É¹²³É¹²⁴É¹²⁵É¹²⁶É¹²⁷É¹²⁸É¹²⁹É¹³⁰É¹³¹É¹³²É¹³³É¹³⁴É¹³⁵É¹³⁶É¹³⁷É¹³⁸É¹³⁹É¹⁴⁰É¹⁴¹É¹⁴²É¹⁴³É¹⁴⁴É¹⁴⁵É¹⁴⁶É¹⁴⁷É¹⁴⁸É¹⁴⁹É¹⁵⁰É¹⁵¹É¹⁵²É¹⁵³É¹⁵⁴É¹⁵⁵É¹⁵⁶É¹⁵⁷É¹⁵⁸É¹⁵⁹É¹⁶⁰É¹⁶¹É¹⁶²É¹⁶³É¹⁶⁴É¹⁶⁵É¹⁶⁶É¹⁶⁷É¹⁶⁸É¹⁶⁹É¹⁷⁰É¹⁷¹É¹⁷²É¹⁷³É¹⁷⁴É¹⁷⁵É¹⁷⁶É¹⁷⁷É¹⁷⁸É¹⁷⁹É¹⁸⁰É¹⁸¹É¹⁸²É¹⁸³É¹⁸⁴É¹⁸⁵É¹⁸⁶É¹⁸⁷É¹⁸⁸É¹⁸⁹É¹⁹⁰É¹⁹¹É¹⁹²É¹⁹³É¹⁹⁴É¹⁹⁵É¹⁹⁶É¹⁹⁷É¹⁹⁸É¹⁹⁹É²⁰⁰É²⁰¹É²⁰²É²⁰³É²⁰⁴É²⁰⁵É²⁰⁶É²⁰⁷É²⁰⁸É²⁰⁹É²¹⁰É²¹¹É²¹²É²¹³É²¹⁴É²¹⁵É²¹⁶É²¹⁷É²¹⁸É²¹⁹É²²⁰É²²¹É²²²É²²³É²²⁴É²²⁵É²²⁶É²²⁷É²²⁸É²²⁹É²³⁰É²³¹É²³²É²³³É²³⁴É²³⁵É²³⁶É²³⁷É²³⁸É²³⁹É²⁴⁰É²⁴¹É²⁴²É²⁴³É²⁴⁴É²⁴⁵É²⁴⁶É²⁴⁷É²⁴⁸É²⁴⁹É²⁵⁰É²⁵¹É²⁵²É²⁵³É²⁵⁴É²⁵⁵É²⁵⁶É²⁵⁷É²⁵⁸É²⁵⁹É²⁶⁰É²⁶¹É²⁶²É²⁶³É²⁶⁴É²⁶⁵É²⁶⁶É²⁶⁷É²⁶⁸É²⁶⁹É²⁷⁰É²⁷¹É²⁷²É²⁷³É²⁷⁴É²⁷⁵É²⁷⁶É²⁷⁷É²⁷⁸É²⁷⁹É²⁸⁰É²⁸¹É²⁸²É²⁸³É²⁸⁴É²⁸⁵É²⁸⁶É²⁸⁷É²⁸⁸É²⁸⁹É²⁹⁰É²⁹¹É²⁹²É²⁹³É²⁹⁴É²⁹⁵É²⁹⁶É²⁹⁷É²⁹⁸É²⁹⁹É³⁰⁰É³⁰¹É³⁰²É³⁰³É³⁰⁴É³⁰⁵É³⁰⁶É³⁰⁷É³⁰⁸É³⁰⁹É³¹⁰É³¹¹É³¹²É³¹³É³¹⁴É³¹⁵É³¹⁶É³¹⁷É³¹⁸É³¹⁹É³²⁰É³²¹É³²²É³²³É³²⁴É³²⁵É³²⁶É³²⁷É³²⁸É³²⁹É³³⁰É³³¹É³³²É³³³É³³⁴É³³⁵É³³⁶É³³⁷É³³⁸É³³⁹É³⁴⁰É³⁴¹É³⁴²É³⁴³É³⁴⁴É³⁴⁵É³⁴⁶É³⁴⁷É³⁴⁸É³⁴⁹É³⁵⁰É³⁵¹É³⁵²É³⁵³É³⁵⁴É³⁵⁵É³⁵⁶É³⁵⁷É³⁵⁸É³⁵⁹É³⁶⁰É³⁶¹É³⁶²É³⁶³É³⁶⁴É³⁶⁵É³⁶⁶É³⁶⁷É³⁶⁸É³⁶⁹É³⁷⁰É³⁷¹É³⁷²É³⁷³É³⁷⁴É³⁷⁵É³⁷⁶É³⁷⁷É³⁷⁸É³⁷⁹É³⁸⁰É³⁸¹É³⁸²É³⁸³É³⁸⁴É³⁸⁵É³⁸⁶É³⁸⁷É³⁸⁸É³⁸⁹É³⁹⁰É³⁹¹É³⁹²É³⁹³É³⁹⁴É³⁹⁵É³⁹⁶É³⁹⁷É³⁹⁸É³⁹⁹É⁴⁰⁰É⁴⁰¹É⁴⁰²É⁴⁰³É⁴⁰⁴É⁴⁰⁵É⁴⁰⁶É⁴⁰⁷É⁴⁰⁸É⁴⁰⁹É⁴¹⁰É⁴¹¹É⁴¹²É⁴¹³É⁴¹⁴É⁴¹⁵É⁴¹⁶É⁴¹⁷É⁴¹⁸É⁴¹⁹É⁴²⁰

[illegible]

(Eò) "ÉÉ+bmÉ ¶ÉÉÉ"Év^aÉä EöÉhÉiÉò °ÉÖÉÉ P^aÉÉ'Éò.

3. $\{E \mid E = kE^{\otimes 2} \text{ for } (E, h, \epsilon) \in \mathcal{H}_2\}$:—

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(+) ^aEÉNPÉ °EǾSÉS^aÉÉ "ÉnūÉǾLǾ ÉxÉŦSÉiÉ MÉbSǾ ÉhÉÉ ÉǾ[®]Ŧ.

[illegible]

(Eo) °PQhEESa + ME^u °EVEh^aEE°EE °^aEEPE {E^uEO °EEEE. E°EE°E {E^uEE^u °EE°EE.

4. **EòhÉi^aÉÉ1/2) nÉÉÉä ÉxÉ[®]Éò[®]hÉ Éò[®]ú :—**

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(+) $0.1 \text{ mol} \cdot \text{L}^{-1} \text{HCl} + 0.1 \text{ mol} \cdot \text{L}^{-1} \text{NaOH} \rightarrow 0.1 \text{ mol} \cdot \text{L}^{-1} \text{NaCl} + 0.1 \text{ mol} \cdot \text{L}^{-1} \text{H}_2\text{O}$?

$$(d) \quad \frac{1}{2} \left(\frac{1}{2} \frac{d^2 \epsilon}{d\alpha^2} + \epsilon \right) \frac{d\epsilon}{d\alpha} = n \frac{1}{2} \frac{d^2 \epsilon}{d\alpha^2} \frac{1}{2} \frac{d\epsilon}{d\alpha} + \epsilon \frac{d\epsilon}{d\alpha} \quad \epsilon = 0.$$

(Eò) "ÉΓΕΩΚΕ ΜΕΙΛΟΝΕΣΑ + ΜΕΛΛΕΙΝ ΕΟΕ ΟΕ ΕΝΕΕ ΕΝΕ ΟΕΕΕ.

5. $\frac{d}{dt} \left(\frac{1}{2} m v^2 \right) = \frac{d}{dt} \left(\frac{1}{2} m \left(\frac{dx}{dt} \right)^2 \right) = m v \frac{dv}{dt} = m v a = m v \frac{d^2 x}{dt^2} = \frac{d}{dt} \left(m v \frac{dx}{dt} \right) = \frac{d}{dt} (m v^2)$:—

16

[illegible]

(d) $\{E_i^{\otimes \alpha} + E_j^{\otimes \beta}\}$ is a basis for $E_{\alpha+\beta}$. Is it true that $\{E_i^{\otimes \alpha} + E_j^{\otimes \beta}\}$ is a basis for $E_{\alpha+\beta}$?

$$(E_0) + \{f_{\text{aff}}(E_0)\} = t_{\text{aff}}(E_0) + f_{\text{aff}}(E_0) = (f_{\text{aff}}(E_0))$$
$$[\pm E] \text{ Ȳ } \{E/2\}$$

6. $\mathbb{R}^n \in \mathcal{A} = \mathcal{K}^{\otimes n} \text{ t } \mathbb{R}^n \text{ (E d h i e p n e)} : -$

(+) +ÉtÊMÉEò EòSÈ®Ù ÊÉ±½PÉE] ò ±EE ÊhªEÉSÈD |EEGòªEE °{E¹] ò Eò®Ù.

(c) $\{E^{\otimes n}\}_{n \geq 0}$ is a S^1 -equivariant spectrum. Is $E^{\otimes n}$ a S^1 -equivariant spectrum?

[illegible][illegible]

(ENGLISH)

[TIME ALLOWED—3 HOURS]

(MARKS—100)

SAFETY IN ENGINEERING INDUSTRY (THEORY-VIII)

- Instructions.*—(1) All question are *Compulsory*.
(2) Illustrate your answer with *neat sketches* wherever necessary.
(3) Figures to the right indicate *full* marks.
(4) Assume suitable data if *necessary*.

- | | Marks |
|--|--------------|
| 1. Write a short notes on (any <i>four</i>) :— | 20 |
| (a) Hot rolling process. | |
| (b) Type of In-running nips. | |
| (c) Principle of mechanical guarding. | |
| (d) Types of mechanical motions. | |
| (e) Zero mechanical status. | |
| 2. Explain the following (any <i>two</i>) :— | 16 |
| (a) Explain economics of machine guarding. | |
| (b) Draw the neat sketch of adjustable fixed guard for drilling operation. State advantages and disadvantages. | |
| (c) What are Safety precautions to be taken in moulding shop ? | |
| 3. Answer the following (any <i>two</i>) :— | 16 |
| (a) With the help of suitable sketches, described the fixed guards. | |
| (b) Explain the various hazards in heat treatment operation. What are method of control and prevention ? | |
| (c) Explain the correct method of measuring guarding distances form transmission in various positions. | |
| 4. Solve (any <i>two</i>) :— | 16 |
| (a) What are the advantages and disadvantages of automatic guards ? | |
| (b) With suitable example and sketch described the working of Automatic Guards. | |
| (c) Explain Ergonomics of machine guarding. | |
| 5. Answer in brief (any <i>two</i>) :— | 16 |
| (a) What is safety precaution to be taken while welding ? | |
| (b) What are the safety precautions to be taken while operating a power pressure ? | |
| (c) What are the health and welfare measure to be taken in engineering industry ? | |

6 Answer in short (any *two*) :—

16

- (a) Explain the process of Industrial waste disposals.
 - (b) What are the safety precautions to be taken while operating a power pressure ?
 - (c) What are the uses of Interlocking Guards ? Explain Interlocking pressure exhaust used in Injection Molding machine ?
 - (d) What do you understand by preventive Maintenance ? Prepare a checklist for safe operation of lathe Machine.
-