Solution & Marking scheme

Total No. of Questions – [4] Total No. of Printed Pages 2

G.R. No.	

U218-154(T2)

OCTOBER 2018/ IN-SEM (T2)

S. Y. B. TECH. (MECHANICAL ENGINEERING) (SEMESTER - I)

COURSE NAME: STRENGTH OF MATERIALS

COURSE CODE: MEUA21174

(PATTERN 2017)

Time: [**1Hour**] [Max. Marks: **30**]

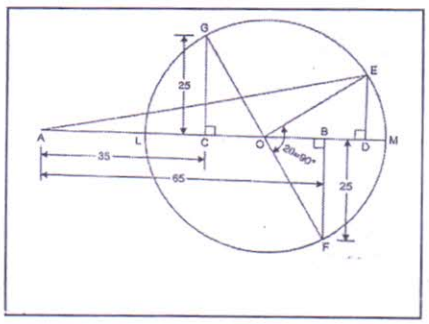
SOLUTION & MARKING SCHEME

Q.1) a) Mohr's circle----------03 marks
normal stress= 120N/mm²--------01 marks
tangential stress= 20 N/mm² -----01 marks
resultant stress= 121 N/mm² -----01 marks

b) List of theories of failure---------02 marks
maximum principal stress theory-----04 marks

c) Principal plane---------02 marks
Principal stress---------02 marks

OR



Q.2) a) Mohr's circle----------03 marks
normal stress= 120N/mm²--------01 marks
tangential stress= 20 N/mm² -----01 marks
resultant stress= 121 N/mm² -----01 marks

b) $\sigma_n = \frac{\sigma_1 + \sigma_2}{2} + \frac{\sigma_1 - \sigma_2}{2} \cos 2\theta$ 03 marks

$\sigma_T = \frac{(\sigma_1 - \sigma_2)}{2} \sin 2\theta$ 03arks

c) theory of failure used for Ductile material-----04 marks

Q.3) a) Assumption-------02 marks

$\frac{M}{I} = \frac{E}{R} = \frac{\sigma}{y}$ ----------04 marks

b) Calculation for MI —— 02 marks

Max^{M} stress $\tau = 137.6\ N/mm^2$ —— 02 marks

c) $\tau = \frac{3}{2}\tau_{Avg}$

OR

Q.4) a). $M = 199\ KN\text{-}M$
$WL = 756$ } 01 mark
$W = 369.2\ KN$
$L = 2.51\ M$ } —02 mark each

b) Shear force AB = 0, Bending moment = W·a } one mark each
SFD + BMD

c) at 40mm $S = 144000N$, $\tau_{40} = 0$
at 20mm $\tau_{20} = 33.76$ Fig-01 one mark each

*****Best Luck***

Marking Scheme

c) Design a Master-Slave Flip-Flop using J-K flip-flop. [4]

1. Truth Table: 1 Mark
2. Logical Circuit Diagram: 3 Marks

Q3) a) Design a full adder circuit using PLA having three inputs, eight product terms, and two outputs. [6]

1. Truth Table & Expression for Sum & Carry: 1 Marks
2. Kmaps & Expressions: 2 Marks
3. PLA Table: 1 Mark
4. Logical Circuit Diagram: 2 Marks

b) Implement a PLA for the given table [4]

1. Logical Circuit Diagram: 4 Marks

c) Draw structural architecture of PLA & PAL. [4]

1. PLA Structure: 2 Marks
2. PAL Structure: 2 Marks

OR

Q4) a) Implement f1(x2, x1) = $\sum m(0,3)$, f2(x2, x1) = $\overline{x2+x1}$, and f3(x2, x1) = $\Pi M(1)$ with a 4 X 3 ROM. [6]

1. Truth Table & Expression for Sum & Carry: 2 Marks
2. Logical Circuit Diagram: 4 Marks

b) What are types of PLD's? Draw structural diagram for any 3. [4]

1. List of Type: 1 Mark
2. Structure of PLD: 3 Marks

c) Design ROM as PLD for 4 X 2 ROM. [4]

1. Truth Table: 1 Mark
2. Logical Circuit Diagram: 3 Marks