Assignment 2

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2018-09-12, 23:59 IST.

1) The following fringe patterns are obtained for a disc under diametral compression. The patterns represent contours of 1 point

- $\sigma_1 + \sigma_2$
- $\sigma_1 - \sigma_2$
- Maximum shear stress
- Principal stresses

No, the answer is incorrect.
Score: 0
Accepted Answers:
$\sigma_1 - \sigma_2$

2) For a disc under diametral compression the fringe pattern shown in figure is obtained using Moiré technique. The patterns represent the contours of 1 point

- $v$ displacement
- Out of plane displacement
- $u$ displacement
- Strain

No, the answer is incorrect.
Score: 0
Accepted Answers:
$u$ displacement
4) For a clamped circular plate under central load, the out of plane displacement fringe contours are

- Parallel lines
- Perpendicular lines
- Concentric circles
- Overlapping circles

No, the answer is incorrect.
Score: 0
Accepted Answers:
Concentric circles

5) The following fringe patterns are obtained using shearing interferometry. The patterns represent contours of

- Slope for a circular plate with central load
- Out of plane displacement for circular plate with central load
- \(\nu\) displacement for circular disc under diametral compression
- Slope for circular disc under diametral compression

No, the answer is incorrect.
Score: 0
Accepted Answers:
Slope for a circular plate with central load

6) The photoelastic fringe patterns for a spanner tightening a nut is shown in the figure. There are three points in the spanner indicated by alphabets A, B and C. Identify the point where there is maximum stress concentration. Indicate the point using alphabet A, B or C. (Answer A, B or C)
7) For the problem of spanner tightening a nut, which of the following approaches can be considered for getting whole-field stress/strain information.

- Strength of Materials
- Theory of elasticity
- Numerical methods
- Experimental methods

No, the answer is incorrect.
Score: 0
Accepted Answers:
- Numerical methods
- Experimental methods

8) A numerical solution of a model using a commercial Finite Element software can be used to visualize

- Stress field
- Displacement field
- Strain field
- All of these

No, the answer is incorrect.
Score: 0
Accepted Answers:
- All of these

9) The gauge length of the strain gauge shown in the figure is the distance from the points

- A to D
- B to C
10) A Wheatstone bridge circuit is shown in the figure. The resistances are indicated by $R_1$, $R_2$, $R_3$ and $R_4$. One is provided with two equal resistance strain gauges $S_1$ and $S_2$ which measures the same value of strain, one of which is tensile ($S_1$) and the other compressive($S_2$). By replacing which of the resistance with strain gauges, one would get correct measurement of strain?

- $R_1$ with $S_1$ and $R_3$ with $S_2$
- $R_1$ with $S_1$ and $R_2$ with $S_2$
- $R_4$ with $S_1$ and $R_2$ with $S_2$
- $R_2$ with $S_2$ and $R_4$ with $S_1$

No, the answer is incorrect.
Score: 0
Accepted Answers:
$R_1$ with $S_1$ and $R_2$ with $S_2$

11) Two 120Ω strain gauges (1 and 2) shown in figure (a) each measuring 100 με are rej with the resistance $R_1$ and $R_3$ of the Wheatstone bridge shown in figure (b). What value of strain measured,

- 100 με
- 200 με
- Cannot find with the given data
12) Match the fringes obtained in a circular disc under diametral compression with the corresponding information obtainable.

A) | B) | C) | D) 
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i) u-displacement  ii) v-displacement  iii) $\sigma_1 - \sigma_2$  iv) $\sigma_1 + \sigma_2$

- A-ii, B-iii, C-ii, D-iii
- A-i, B-iii, C-i, D-iii
- A-iv, B-iv, C-ii, D-i
- A-i, B-iv, C-iv, D-i

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
A-ii, B-iii, C-ii, D-iii

13) Strain rosette shown in the figure measures, strains 25 $\mu$e, 50 $\mu$e, 80 $\mu$e in strain gauges and C respectively. Find out the components of the strain tensor at point O.

- $\varepsilon_{xx} = 80 \mu$e; $\varepsilon_{yy} = 25 \mu$e; $\gamma_{xy} = -5 \mu$e;
- $\varepsilon_{xx} = 25 \mu$e; $\varepsilon_{yy} = 80 \mu$e; $\gamma_{xy} = -5 \mu$e;
- $\varepsilon_{xx} = 25 \mu$e; $\varepsilon_{yy} = -5 \mu$e; $\gamma_{xy} = 25 \mu$e;
- $\varepsilon_{xx} = 25 \mu$e; $\varepsilon_{yy} = -5 \mu$e; $\gamma_{xy} = 25 \mu$e;

No, the answer is incorrect.  
Score: 0  
Accepted Answers:  
$\varepsilon_{xx} = 25 \mu$e; $\varepsilon_{yy} = 80 \mu$e; $\gamma_{xy} = -5\mu$e;

14)
An epoxy disc is subjected to diametral compression (diameter = 60 mm, \( F_s = 12 \) N/mm/Fringe, Load = 800 N, thickness = 6mm). Fringe order (\( N \)) and isoclinic angle (\( \theta \)) at a point in the disc are found to be 2 and 30°. Find out

\[ (\sigma_1 - \sigma_2) \text{ in MPa} \]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 3.5, 4.5

\[ (\sigma_\alpha - \sigma_\gamma) \text{ in MPa} \]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 1.5, 2.5

\[ r_{xy} \text{ in MPa} \]

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: Range) 1.5, 2