Register Number.....

**M.E. DEGREE EXAMINATIONS: OCTOBER / NOVEMBER 2008**

Third Semester

**STRUCTURAL ENGINEERING**

**P07SEE02 Experimental Methods and Model Analysis**

**Time: Three Hours** **Maximum Marks: 100**

**Answer ALL Questions:-**

**PART A ( 20 X 1 = 20 Marks)**

1) The ratio of smallest reading of scale to multiplication factor is

A) Strain sensitivity B) Deformation sensitivity C) Range D) Accuracy

2) The strain gauge working on the principle of relative discharge of air between a fixed orifice and a variable orifice is

A) Orifice meter B) Venturimeter C) Pneumatic gauge D) Optical gauge

3) A gauge that can be used for measuring that can be used for measuring deformation of rail-road rails is

A) Huggen Berger gauge B) Screw gauge C) Acoustic gauge D) Scratch gauge

4) The gauge used to measure torque is

A) Troptometer B) Extensometer C) Compressometer D) Screw gauge

5) In a strain gauge grid,the material providing necessary electrical insulation between the grid and the material to be tested is called

A) Grid material B) Carrier material C) Test material D) Junction material

6) A set of strain gauges used at a point to determine the state of strain at the point is

A) Point gauge B) Surface rosette C) Linear gauge D) Strain rosette

7) Marten's mirror extensometer is one of the type of

A) Mechanical strain gauge B) Electrical strain gauge C) Optical strain gauge
D) Acoustical strain gauge

8) Both the ends of a bonded non-metalic gauge will have

A) Nickel plate B) Zinc plate C) Silver plate D) aluminium plate

9) The speed of the capstan motor in a magnetic tape recorder is monitored with a _____

A) Speedometer B)Accelerometer C)Photocell D) Chopper

10) _____ rosette with its evenly distributed gauge line directions is best suited in cases where the direction of principal strains cannot be established approximately before test

A) 2-Gauge rosette B) Rectangular rosette C) Delta-rosette D) circular rosette

11) The phenomenon of moiré fringes was first described by

A) Moiré B) Rayleigh C) Euler D) Dennisritche

12) Cathode-Ray oscilloscope is suitable for

A) Very low frequency B) Intermediate frequency C) High frequency D) Very high frequency

13) Example for a Electroacoustic is

A) Polariscope B) Soniscope C) Clinometer D) Sonometer

14) _____ is the loci of points along which the principal stress have parallel directions

A) Isoclinics B) Isochromatics C) Iso bars D) Isotherm

15) To decrease the band width of the isochromatic fringes, an ordinary circular polariscope is modified by inserting _____ on both sides of the model

A) Lens B) Partial mirrors C) Both lens & mirrors D) prism

16) Relaxation method of stress separation is based on

A) Equilibrium equation B) Compatibility equation C) Hooke's law D) Oblique incidence method

17) _____ is also called the wave front reconstruction process

A) Photo elasticity B) Holography C) Hologram D)Laser

18) Two systems are said to have _____ if homologous parts of the systems experience similar net forces

A) Homologous points B) Static similarity C) Dynamic similarity D) Kinematic similarity

19) In a _____ , the horizontal lengths and vertical lengths are reduced by differe scales

A) Scaled model B) Reduced model C) Distorted model D) Enlarged model

20) _____ analysis is based on the assumptions that in equations with terms representing vectorial entities both members must have resultants with same magnitude and direction

A) Dimensional analysis B) Directional analysis C) Dynamic analysis D) Statics analysis

## PART B (5x16=80 Marks)

21 a). (i)Explain the characteristics of a strain gauge. (8)

(ii)Explain the working principle of Huggenberger Tensometer with neat sketch . (8)

**(Or)**

21 b).(i) Describe in detail the principle of working, uses of a LVDT . (8)

(ii) What are the different types of materials used in metallic resistance strain gauges? Give their properties in brief. (8)

22 a) (i)Briefly explain the methodology of potentiometer circuit . (8)

(ii) Explain any one type of wheat stone bridge circuit . (8)

**(Or)**

22 b) (i)Explain any two types of electrical resistance strain gauge. (8)

(ii)Differentiate between bonded and unbonded gauge. (4)

(iii) Explain the material used for lead wires. (4)

23 a) (i)Explain in detail about cathode ray oscilloscope. (8)

(ii)Explain the phenomenon of X-Ray Recorder . (8)

**(Or)**

23 b) (i) What are the factors affecting the computation of strain Rosette data ? (8)

(ii)What are the applications of moiré methods? Discuss. (8)

24 a) (i) Explain the Schmidt hammer test. (8)

(ii)Describe briefly the scattered light method of photoelastics stress analysis. (8)

**(Or)**

24 b) (i) Explain isoclinic and isochromatic fringes. (8)

(ii) Briefly describe any two methods of stress separation. (8)

25 a) (i) Differentiate between geometric similarity and complete similarity. (8)

(ii) How a structure is tested for wind force by modeling ? Explain . (8)

**(Or)**

25 b) (i) Out line the testing procedure for large scale structure. (8)

(ii) What are the various schematics for hologram interferometer? (8)

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