

--	--	--	--	--	--	--	--	--	--

END SEMESTER EXAMINATIONS, APRIL 2011

**III SEMESTER BE (R-2004)
(Common to Industrial, Manufacturing and Mining)**

CE 295 STRENGTH OF MATERIALS

Time : 3 Hours

Max.Marks : 100

PART-A (10 x 2 = 20 marks)

1. Draw qualitative stress strain curve for mild steel.
2. What does the radius of a Mohr's refer to?
3. Explain the failure of a thin shell.
4. Draw SFD for a 5m cantilever beam carrying a uniformly distributed load of 5 kN/m over the entire length.
5. What is the section modulus of a hollow circular section?
6. How do you differentiate a closely coiled helical spring and an open coiled helical spring?
7. Derive a relation for torsion moment carrying capacity of a solid circular shaft.
8. Write an expression for maximum deflection of a simply supported beam carrying a uniformly distributed load of W/unit length over the entire length.
9. Draw the qualitative conjugate beam for a simply supported beam of length l having a central point load W.
10. What is strain energy?

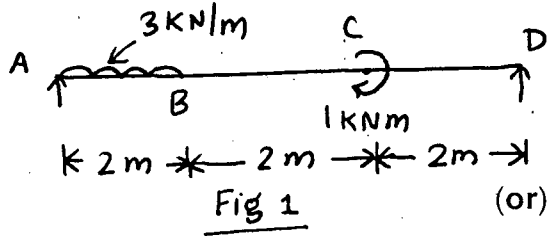
PART-B (5 x 16 = 80 marks)

11. - Prove that a hollow shaft is stronger and stiffer than the solid shaft of the same material, length and weight.
- 12.a) Derive relations for change in length, change in diameter and change in volume of a thin cylinder subjected to an internal pressure P

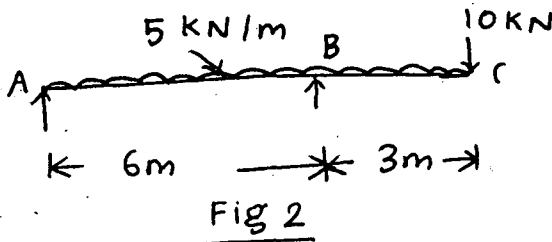
(or)

- 12.b) A steel cube block of 50 mm side is subjected to a force of 6 kN (Tension), 8 kN (Tension) and 4 kN (Compression) along x, y and z direction respectively. Determine the change in volume of the block. Take E as 200 Gpa and m as 10/3.

13.a) Draw SFD and BMD for the beam given in Fig 1.



13.b) Draw SFD and BMD for the beam given in Fig 2.



14.a) A cast iron pipe of external diameter 200 mm, 20 mm thickness and 7.5 m long is simply supported at its ends. The pipe carries a uniformly distributed load of 5 kN/m (excluding the self weight) over the full length. Calculate the maximum flexural stress induced. Assume the unit weight of material of a pipe as 80 kN/m^3 .

(or)

14.b) A beam ACB is simply supported at A and B. It carries uniformly distributed load of 10 kN/m intensity over the whole span and a clockwise moment of 100 kNm is acting at C. if $AC = 4 \text{ m}$, $CB = 6 \text{ m}$ and $EI = 50 \text{ MNm}^2$. Find the deflection at C and the deflection at the mid span using Macaulay's method.

15.a) A cantilever beam ACB of length 2m is carrying a point load of 10kN at B. The moment of inertia for the right half of the cantilever is 10^8 mm^4 , whereas that of the left half is $2 \times 10^8 \text{ mm}^4$. If $E = 2 \times 10^8 \text{ kN/mm}^2$, find the slope and deflection at the free end. Use Conjugate beam method

(or)

15.b) Find the slope at the ends of a simply supported beam of 6m span carrying an UDL of 3kN/m over the entire span. $EI = 40000 \text{ kNm}^2$. Use energy principles.

Part – B (5 X 16 = 80 Mark)

11. a(i) Discuss the age-structure pyramid types for predicting population growth trend of a nation with examples. **10 marks**
a(ii) Write the role of NMIS, ENVIS and GIS in dissemination of Environmental information and management. **6 marks**

12. a(i) Briefly discuss insitu and ex-situ conservation of biodiversity. **10 marks**
a(ii) What are hotspots of biodiversity? Mention the criteria of recognising hotspots. List out few global hotspots of biodiversity. **6 marks**

OR

- b (i) Discuss the models of energy flow in an ecosystem. **8 marks**
b (ii) Explain characteristic features and functions of 'Aquatic ecosystem'. Draw its ecological pyramid. **8 marks**
13. a (i) Briefly discuss the sources, effects and control measures of urban and industrial solid wastes. **8 marks**
a (ii) Discuss the mitigation and disaster management of a) cyclone b) floods **8 marks**

OR

- b (i) Discuss sources, causes, effects and control measures of marine pollution **8 marks**
b (ii) Give an account of causes, effects and control measure of nuclear hazards. **8 marks**
14. a (i) Write note on the followings **8 marks**
a) Shifting cultivation b) Overgrazing c) Water logging and salinity
d) Environmental refugees.
- a (ii) Discuss the role of an individual in the conservation of different natural resources. **8 marks**

OR

- b(i) Explain the causes, effects and control of land degradation and soil erosion.. **8 marks**

- b(ii) Write notes on the following **8 marks**
a) Biomass energy
b) Solar energy and wind energy
15. a(i) Discuss the salient features of **8 marks**
a) Wildlife (protection) Act and
b) Forest conservation Act
- a(ii) What do you mean by sustainable development? Write the major measures to attain sustainability. **8 marks**
- OR**
- b(i) Explain how population, consumerism and waste products are interrelated? **8 marks**
- b(ii) Describe the different methods to propagate environmental awareness in the society. **8 marks**