Code No. 2286

FACULTY OF ENGINEERING

B.E. 4/4 (Civil) II-Semester (Main) Examination, April / May 2013

Subject : Disaster Mitigation and Management
(Elective-III)

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1. Briefly discuss the Disaster Management cycle with suitable examples.
2. Write about IDNDR.
3. Explain about hydrometerological disasters.
4. List out causes of Industrial hazards.
5. Define cyclone and Tsunamis.
6. Explain about Land desertification.
7. Name two basins in India that are frequently affected by flood and explain the warming dissemination system of India in the flood affected areas.
8. Write about Forest fires.
9. Explain about people's participation in disaster management.
10. What is Rich and Vulnerability.

PART – B (5x10=50 Marks)

11.(a) Explain about natural human induced and human made disaster.
(b) Explain about Goals and objectives of International strategy for Disaster Risk Reduction.

12.(a) Explain the characteristics of a cyclone.
(b) Explain in detail the conditions necessary for the development of a cyclone.

13.(a) Explain about adverse effects of power breakdowns.
(b) Write about Recent power breakdown in A.P. Sate.

14.(a) Describe in detail the hazards produced by chemical disasters.
(b) Describe the case study of Bhopal gas tragedy.

15.(a) What is Remote sensing? How it is helps in the prevention of disasters?
(b) Explain in detail about GIS applications in disaster Risk reduction.

16. Write short notes on :
(a) Landslides and Avalanches
(b) Uses of Remote sensing and GIS

17.(a) Write about Disaster management structure in India.
(b) Explain Rich and Vulnerability to disaster.

*****

Code No. 2283

FACULTY OF ENGINEERING

B.E. 4/4 (Civil) II-Semester (Main) Examination, April / May 2013

Subject : Advanced Transportation Engineering
(Elective-III)

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1. Write any three objectives of Soil Stabilization.
2. Differentiate between tack coat and prime coat.
3. List out various factors which influencing Levels of services.
4. Distinguish between WBN roads and WMM roads in flexible pavements.
5. Write the significance of lane distribution factor and Vehicle damage factor.
6. Explain the terms : ESWL and EALF and Standard Axle.
7. What is the need for evaluation of transportation projects?
8. Describe the objectives of Highway Drainage.
9. Write any three advantages and disadvantages of one way streets.
10. Describe various types of traffic problems in Metropolitan cities.

PART – B (5x10=50 Marks)

11.(a) Explain various factors considered for mechanical stabilization? How would you adopt this particular stabilization method out of various alternatives?

(b) Design the pavement section by group index method for the anticipated traffic volume of over 300 CV/day. The soil sub-grade sample collected from the site and the test results were obtained are as follows: Soil portion passing 0.074 mm sieve is 49% Liquid limit is 43% and plastic limit is 20%.

12.(a) Explain how the structural evaluation is different from functional evaluation. Describe Present Serviceability Index and Present Serviceability rating concept in functional evaluation of pavement.

(b) Design a suitable flexible pavement section (as per IRC 37:2001) for a new express way pavement construction with the following available information. The pavement will be two lane road with a single carriage way. The traffic expected is 650 CV/day in both the directions with average vehicle damage factor of 2.8. Design sub grade CBR is 4% and the assumed design life of the pavement is 12 years.

13.(a) Describe the principle and working of Benkelman beam deflection and also explain the design of flexible overlay over flexible pavement.

(b) What are the various methodologies available for analyzing the accidents? Describe various precautions to be taken to minimize the accidents.

14.(a) Explain the level of service concept as per HCM 2000? Describe about the multimedia capacity highways in rural, urban and expressway?

(b) Design the thickness of CC pavement by IRC method of design. Take the following data. Location of pavement Madhya Pradesh, design axle wheel load 8170 kg, present traffic 500 CV / day, tyre pressure 6.1 kg/cm^2, modulus of sub-grade reaction is 6.8 kg.m^3, flexural strength of concrete is 45 kg/cm^3, thermal co-efficient of concrete is $8x10^{-6}$ per ^0C, temperature difference during the day is 1^0C and pavement dimensions are 7.0 x 3.5m and design life of pavement is 25 years. The Axle load spectrum obtained from axle load surveys is given in the following:.

Single Axle loads		Tandem Axle loads	
Axle Load Class tons	% of Axle loads	Axle Load Class, ton	% of Axle loads
19-21	0.5	34-38	0.5
17-19	1.6	30-34	0.6
15-17	4.9	26-30	0.4
13-15	10.8	22-26	2.0
11-13	20	18-22	2.5
9-11	25.2	14-18	3.2
<9	25	<14	2.8

15.(a) Design the dowel bar system at the transverse joint of Cement Concrete pavement having thickness 30 cm. E = 3 x 10^5 kg/cm^2, =0.15, design wheel load 5100 kg, joint spacing 2.0 cm, Fs=1000 kg/cm^2, Ff=1400Kg/cm^2, Fb=100/kg/cm^2 and K=4.60 Kg/cm^3. Assume other data suitably as per IRC.

(b) Explain net present value and rate of return techniques used for highway economic evaluation.

16.(a) What are advantages and disadvantage of exclusive bus lanes system in urban context of developing countries?

(b) What are the possibilities of improving the vehicular flow using TSM measures? Explain the concept of reversible lanes with the help of diagram.

17. Write short notes on any **four** of the following:

(a) Parking inventory systems

(b) Computer applications for traffic and transportation planning

(c) Public transportation and metro rail role in Metropolitan cities

(d) Transportation - environmental - problems and issues

(e) Surface drainage system in Urban areas

(f) International Roughness Index

*****

Code No. 2284

FACULTY OF ENGINEERING

B.E. 4/4 (Civil) II-Semester (Main) Examination, April / May 2013

Subject : Ground Water Hydrology
(Elective-III)

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1. What is the nature of groundwater flow? State the low governing the flow with limitations if any. (3)
2. State the Dupit's assumptions used while deriving steady radial flow equations. (3)
3. Explain the concept of Image well theory. (3)
4. Briefly mention the versions uses of surface geophysical techniques. (3)
5. What is the principle behind artificial recharge of ground water ? (2)
6. State the working principle of viscous flow models. (2)
7. What do you understand by geophysical well logging? (2)
8. With the aid of simple sketch, briefly explain the scope of freshwater saltwater interface. (2)
9. Discuss about non equilibrium equation for pumping test used in the analysis of unsteady radial flow into a well. (3)
10. Write the expression for yield from a well driven inconfined and unconfined aquifer under steady state conditions. (2)

PART – B (5x10=50 Marks)

11. From an alluvial basin having an area of 200 km^2 in a years time 160 Mm^3 of groundwater was pumped, resulting in a drop of ground water table by 8mts. Estimate the specific yield of the aquifer, if there is no replenishment. Calculate the porosity of the soil, if the specific retention is 10%. (10)

12. A pumping out test was performed in a confined homogenous and esotropic quifer of infinite a real extent. The constant pumping rate was 200m^3/hr. The following draw downs were observed in an observation will located at 500 mts from the pumped one: (10)

Time (hrs)	0.10	0.60	1.60	5.0	16.0	100.0
Drawdown(mts)	0.40	0.50	0.90	1.35	1.66	1.71

Determine the aquifer parameters by Jacob's method.

13. Explain with the aid of neat sketches the electrical resistivity method and seismic refraction method of surface geophysical exploration methods. (10)

14. (a) Explain the mechanism responsible for salt water intrusion and derive Ghyben-Hezberg relation. (4)
    (b) How do you prevent and control sea-water intrusion? (4)

15. (a) With the aid of neat sketches, discuss in detail electric analog models, sand models. (6)
    (b) Discuss briefly about hydrologic balance equation. (4)

16. Obtain the differential equation of the form $\nabla^2 h = \frac{S}{T}\frac{\partial h}{\partial T}$ governing unsteady groundwater flow in a homogeneous, isotropic confined aquifer using various compressibility parameters. (10)

17. Write short notes on the following: (10)
    (a) Finite difference method numerical analysis
    (b) Partial penetration of wells
    (c) Equation for steady flow with uniform recharge

*****

Code No. 3285

FACULTY OF ENGINEERING

B.E. 4/4 (Civil) II-Semester (Main) Examination, April / May 2013

Subject : Finite Elements Methods
(Elective-III)

Time : 3 Hours **Max. Marks: 75**

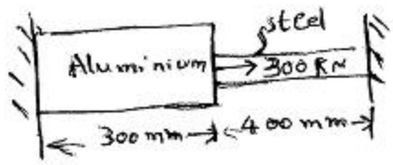
Note: Answer all questions of Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1. Write stiffness matrix for a 2 noded (2DOF) beam elements. (3)
2. Develop the strain displacement relationship for a 2-D continuum. (2)
3. Explain about the Galeykin's method. (2)
4. List the disadvantages of finite element method. (3)
5. Write down the constructive relationship matrix for an ax symmetric problem. (3)
6. What do you understand by volume-coordinates? Explain. (3)
7. Develop the transformation matrix for a truss element with nodal coordinates as (3, 5) and (-3, -4). (3)
8. A triangular element has its nodes at (3.0, 3.0), (1.0, 0.0) and (0.5, 0.5). Develop the shape function at the second node. (2)
9. Write the strain displacement matrix for an axisymmetric element. (2)
10. What are the convergence criteria for placement models? (2)

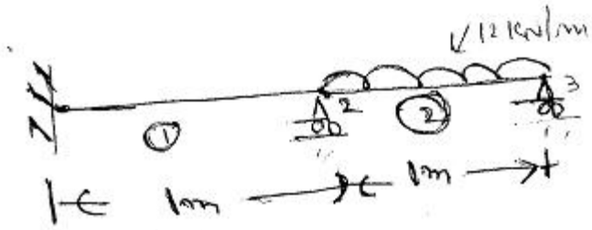
PART – B (50 Marks)

11. An axial load of 300 KN is applied on the stepped bar as shown in figure.



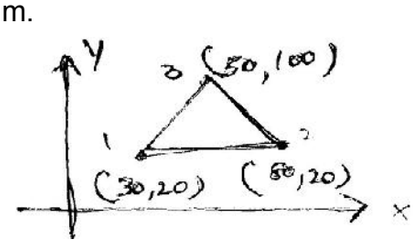
$E_{al}=0.7x10^5$ MPa
A_{al} = 2400 mm^2
$E_s=2x10^5$ MPa
A_s=600 mm^2
Calculate
(i) nodel displacement
(ii) Reaction forces
(iii) Induced stresses in each material .

12. For the beam loaded as shown in figure, determine the slopes at nodes 2 and 3 and the vertical deflection at the mid-point of the distributed load.



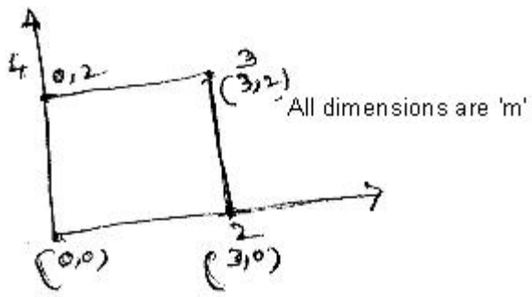
Take E= 200 GPa, I = $4x10^{-6}$ m^4.

13. For the plane stress element shown in figure evaluate the stiffness matrix. Take E = 210 x 10^3 N/mm^2, Poisson ratio = 0.25, and element thickness = 10mm. The co-ordinates are given in mm.

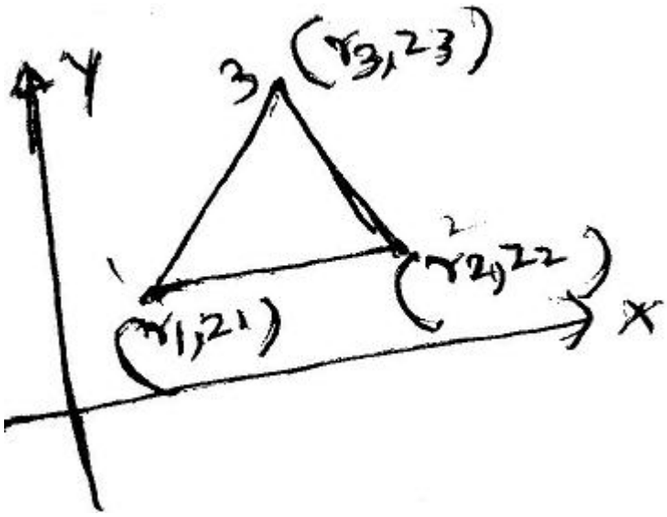


..2

14. For a four noded rectangular element shown in figure. Determine the Jacobian matrix 'J' and strain displacement matrix 'B'. Take E = 210 GPa, μ = 0.25, ξ = 0 : η=0
    [δ] = [0,0, 0.002, 0.003, 0.005, 0.004, 0.0]T
    Assume



15. The nodal coordination for an axisymmetric triangular element shown in figure are given below:
    r_1 = 20mm ; z_1 = 10mm ; r_2 = 40mm
    z_2 = 10 mm; r_3 = 30 mm;' z_2 = 50mm
    Determine the strain displacement matrix 'B' for that element.



16. Derive the equations of equilibrium and boundary conditions for a two dimensional continua.

17. Write short notes on the following:
    (a) Constant strain triangle
    (b) Discritization of continuum
    (c) Gauss quadrature technique.

*****