

**FACULTY OF ENGINEERING****B.E. 4/4 (Civil.) I-Semester (Main) Examination, November / December 2012****Subject : Geographical Information System  
(Elective-I)****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 explain the components of Geographical Information System. (2)
2. Discuss the common coordinate system in spatial data. (2)
3. What is the difference between a database and a database management system? (3)
4. Distinguish between data acquisition and data analysis. (3)
5. Explain why digitization is necessary. (2)
6. What is buffer ? And give its advantages. (3)
7. Write down the limitation of satellite remote sensing. (3)
8. Differentiate between attribute data and spatial data. (2)
9. Define the spectral signatures. (2)
10. Briefly explain about the overlay analysis. (3)

**PART – B (5x10=50 Marks)**

- 11.(a) Explain the application of GIS in watershed Development. (5)
- (b) Discuss the spatial database management with relevance to GIS. (5)
- 12.(a) What do you mean by digital elevation data and data compression? (5)
- (b) Define the data Acquisition and data Interaction and data processing. (5)
- 13.(a) Differentiate between the vector data models and raster data models. (5)
- (b) What is meant by scattering? Explain its types with neat sketches. (5)
14. Briefly explain the type of Geometric and radiometric correction and also discuss about the merits and demerits. (10)
15. Briefly explain the electromagnetic spectrum and draw the spectral reflectance curves of earth's surface features. (10)
16. What is database management structure (DBMS) ? Briefly explain about its types with examples. (10)
17. Write short note on the following: (10)
  - (a) Explain the different types of platforms used in remote sensing
  - (b) What are the main issues to be considered by users of large corporate GIS data bases?
  - (c) Overlay analysis

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**FACULTY OF ENGINEERING**

B.E. 4/4 (Civil) I-Semester (Main) Examination, November / December 2012

**Subject : Pre-Stressed Concrete  
(Elective-I)****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions of Part - A and answer any five questions from Part-B.  
Assume any missing data suitably.****PART – A (25 Marks)**

1. State the difference between pretensioned and post tensioned elements. (3)
2. Where circular prestressing is adopted ? (3)
3. Define reinforcement ratio. (2)
4. List out different losses which occur in pre tensioned and post tensioned elements. (3)
5. Explain the term 'minimum prestressing force'. (2)
6. List out different type of shear cracks occur in prestressed concrete. And also give the equation to calculate the ultimate shear resistance capacity. (3)
7. Give the deflection equation for trapezoidal tendon profile. (3)
8. List out different methods used to calculate anchorage zone stresses. (3)
9. Give any three advantages of continuous beams. (3)

**PART – B (5x10=50 Marks)**

10. Explain the need for high strength steel and concrete in prestressing technique? Also explain the advantages of prestressed concrete in detail.
11. A post tensioned concrete beam, 150mm. Wide and 350mm deep is prestressed by four cables each with a cross sectional area of  $75 \text{ mm}^2$  and with an initial stress of  $1100 \text{ N/mm}^2$ . All four cables are straight and located at 110mm from the soffit of the beam. If the modular ratio is 6, calculate the loss of stress in the four cables due to elastic deformation of concrete for only the following cases:
  - (a) Simultaneous tensioning and anchoring of all the four cables and
  - (b) Successive tensioning of four cables, one at a time.
12. A concrete beam of symmetrical I-section spanning 8m has a flange width and thickness of 250 and 50mm, respectively. The overall depth of the beam is 500mm, the thickness of web is 60mm. The beam is prestressed by a straight cable with an effective force of 100 KN. The live load on the beam is 2 KN/m. Draw the stress distribution diagram at the central section for prestress + self weight + live load.
13. A PSC T-beam has a flange 1000 mm wide and 200 mm thick. The web is 200 mm thick and 1000 mm deep. At a particular section the beam is subjected to an ultimate moment and shear force of 2000 KN-m and 250 KN respectively. Calculate the flexure shear resistance and design suitable shear reinforcement at the section using the following data:
  - Effective depth = 1100 mm
  - Cube strength of concrete = 40 MPa
  - Effective prestress at the extreme tensile face of beam =  $19.3 \text{ M/mm}^2$ .
  - Second moment of area of cross section =  $7.533 \times 10^{10} \text{ mm}^4$
  - Area of prestressing steel =  $2310 \text{ mm}^2$
  - Tensile strength of tendons =  $1500 \text{ N/mm}^2$
  - Effective stress in tendons after all losses =  $900 \text{ N/mm}^2$

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14. A prestressed concrete beam having a cross section 300 x 500mm is simply supported over a span of 12m. It supports a uniformly distributed imposed load of 4kN/m. The tendon follows a trapezoidal profile with an eccentricity of 100 mm within the middle-third of the span and varies linearly from the third span points to zero at the supports. The area of the tendons  $A_p=360 \text{ mm}^2$  have effective prestress of  $1100 \text{ N/mm}^2$  immediately after transfer. Using the following data, calculate.
- (a) The short-term deflection and
  - (b) The long term deflections
- Assume  $E_c=34 \text{ kN/mm}^2$  ;  $E_s=200 \text{ kN/mm}^2$   
Creep coefficient =2  
Concrete shrinkage,  $E_{cs} = 400 \times 10^{-6}$   
Relaxation of steel stress=10%
- 15.(a) Explain in detail the importance of end block design in prestressed concrete members.
- (b) Discuss in detail the double anchor and single anchor stress distribution with neat sketches by Guyon's method.
16. Write short notes on the following:
- (a) Design of continuous beams according to IS specifications.
  - (b) Design of prestressed concrete members under flexure.

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**FACULTY OF ENGINEERING****B.E. 4/4 (Civil.) I-Semester (Main) Examination, November / December 2012****Subject : Surface and Ground Water Management  
(Elective-I)****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 two characteristics of systems analysis. (2)
2. Write the differences between linear and dynamic programming. (2)
3. Define conjunctive use. (2)
4. Explain about induced recharge. (2)
5. Write about porous media models. (2)
6. Explain the data required for water resources project planning. (3)
7. Explain various types of simulation models. (3)
8. Explain the importance of basin management. (3)
9. Explain the concept of artificial recharge with a sketch. (3)
10. What do you understand by Reservoir operation with a sketch ? (3)

**PART – B (5x10=50 Marks)**

- 11.(a) Explain physical, economical and environmental considerations which influence planning of water resources project. (6)
- (b) Explain the various applications of systems analysis. (4)
12. Using simplex method obtain the solution for the following: (10)
 
$$\begin{aligned} \text{Max } Z &= 3x_1 + 5x_2 + 4x_3 \\ \text{Subjected to } 2x_1 + 3x_2 &\leq 8 \\ 2x_2 + 5x_3 &\leq 10 \\ 3x_1 + 2x_2 + 4x_3 &\leq 15 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$
- 13.(a) Explain briefly by means of examples the significance of groundwater management. (5)
- (b) Explain briefly the various ground water basin investigations. (5)
14. With neat sketches explain any two artificial recharge methods in detail. (10)
- 15.(a) Explain the dynamic programming technique in irrigation operation models. (6)
- (b) Explain the viscous fluid model in detail. (4)
- 16.(a) Explain about slack and surplus variables used in linear programming. (5)
- (b) Briefly write about salinity problems and water logging problems. (5)
17. Write short notes on the following: (10)
  - (a) Thermal models and blotting paper models
  - (b) Wastewater recharge for reuse
  - (c) Linear programming and its application to water resource problems

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**FACULTY OF ENGINEERING****B.E. 4/4 (Civil) I-Semester (Main) Examination, November / December 2012****Subject : Elements of Earthquake Engineering  
(Elective-I)****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. How is the magnitude of an earthquake related to the energy released? (2)
2. List some important causes of earthquakes. (3)
3. What do you understand by "degrees of freedom"? (2)
4. Explain the term response spectrum. How is it affected by damping ?  
Show with a sketch. (3)
5. Is "redundancy" desirable in a structure? If so how? (3)
6. Give typical values of response redactor factor (R) for ordinary and ductile  
moment resistant frames as per IS code. (2)
7. List 5 past earthquakes of India having Richter magnitude greater than or = 8. (3)
8. Name some energy dissipation devices. (2)
9. What is the difference between "primary" and "secondary" seismic waves? (3)
10. Explain the term "Rehabilitation".

**PART – B (5x10=50 Marks)**

11. With the help of neat sketches illustrate the different types of "seismic waves" and  
their effects on structures. (10)
- 12.(a) Explain the difference between under over and critically damped vibrations. (5)  
(b) Illustrate with sketches "long" and "short" period structures. (5)
- 13.(a) How do you determine the earthquake forces on buildings as per IS code  
sketch the lateral force and storey shear diagrams? (6)  
(b) Explain the terms "over strength" and "ductility" applied to buildings. (4)
- 14.(a) Illustrate the performance of Non-engineered buildings in sense of the  
past great earth quakes of India. (6)  
(b) Suggest some precautions to be taken to prevent such damages. (4)
15. What do you understand by "seismic retrofitting" , with the help of neat  
sketches illustrate the same for an RC beam and column. (10)
16. With the help of neat sketches illustrate the seismic detailing of RC (10)  
(a) beam (b) column and (c) beam column joint
17. Write short notes on the following: (3x11/3=10)  
(a) Storing ground motions  
(b) Rural houses during earth quakes  
(c) Re-analysis

**FACULTY OF ENGINEERING**

**B.E. 4/4 (Common to All) I-Semester (Main) Examination, November / December  
2012**

**Subject : Entrepreneurship  
(Elective-I)**

**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. Define entrepreneurship. (2)
2. What are the salient features of small scale industries? (3)
3. Differentiate between manager and an entrepreneur. (2)
4. Explain briefly about first generation entrepreneurs. (2)
5. What are the various sources of project financing in India? (2)
6. List out various factors to be considered in choosing the right technology. (2)
7. Define a project and mention different parameters to be considered in project formulation. (3)
8. Discuss about significant features of marketing analysis. (3)
9. What is behaviour? And explain the role of motivation in behaviour of an entrepreneur. (3)
10. Define personality and list out its various attributes. (3)

**PART – B (5x10=50 Marks)**

- 11.(a) List out various opportunities and challenges of entrepreneurs in Indian context. (5)
- (b) Explain the role of entrepreneurs in developing the economical status of a country. (5)
- 12.(a) Explain in detail about women entrepreneurs by highlighting the favourable conditions for them in Indian context. (5)
- (b) Define an Idea and elaborate various methods used for Idea generation. (5)
13. What is project formulation? Explain in detail about marketing, financial and technical analysis in project formulation. (10)
14. Discuss in detail about the concept and salient features of PERT and CPM techniques and explain their role in helping an entrepreneur in successful completion of a project. (10)
- 15.(a) What is leadership? How any entrepreneur develops leadership qualities required to be successful in his profession? (5)
- (b) Explain in detail about Time management matrix. (5)
- 16.(a) Discuss about the concept of assessment of text burden and how it will be helpful to an entrepreneur in planning and managing finance effectively. (5)
- (b) "Entrepreneurs are made not born". Give your views with proper justification. (5)
17. Write short notes on any three of the following : (10)
  - (a) Partnership firm
  - (b) Large scale industries
  - (c) Human aspects in project management
  - (d) Change behaviour

**FACULTY OF ENGINEERING****B.E. 4/4 (Civil.) I-Semester (Main) Examination, November / December 2012****Subject : Operation Research in Civil Engineering  
(Elective-I)****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. Mention different phases in operation research. (2)
2. Briefly describe the classification of optimization problems. (3)
3. Define the terms slack variable and surplus variable. (2)
4. Mention the advantages and limitations of LP models. (3)
5. What are the applications of Linear programming in civil engineering? (3)
6. What are the characteristics of dual problem? (3)
7. How do you generate Random number in simulation? (2)
8. What is the need of a dynamic programming? (2)
9. What are the advantages and limitations of simulation? (2)
10. Distinguish between a serial and non-serial system. (3)

**PART – B (5x10=50 Marks)**

- 11.(a) Write a short note on the necessity of operations research in Civil Engineering.  
(b) Briefly explain various optimization techniques.
12. Solve the following linear programming problem using simplex algorithm.  
Maximize  $Z = 3x_1 + 4x_2$   
Subject to  $2x_1 + 3x_2 \leq 6$   
 $x_1 + 2x_2 = 20$   
and  $x_1, x_2 \geq 0$
- 13.(a) Define Non-linear programming and integer programming.  
(b) Enumerate the advantages of quadratic programming.
14. An irrigation sub-system catered by a branch canal has three large mechanized farm with varying soil and crop characteristics.  
The total resource of the head of this canal is 600 hectare- meters .  
The benefit functions of the forms are as given below:  
Farm 1  $f_1 = 300X - 0.2X^2$   
Farm 2  $f_2 = 200X + 0.1X^2$   
Farm 3  $f_3 = 250X$   
Where X is the water supplied in hectare-meters (ha-m) . The farm 2 insists on a minimum of 100 ha-m, while farm 3 would not take more than 300 ha-m. Obtain the optimal allocation using dynamic programming approach.
15. Give the dual of following problem and solve it by simplex method  
Minimize  $Z = 3x_1 + 5x_2$   
Subject to constraints  $3x_1 + 2x_2 \geq 0$   
 $2x_1 + 4x_2 \geq 40$   
and  $x_1, x_2 \geq 0$
- 16.(a) Briefly explain various statistical aspects of simulation.  
(b) Discuss on statistical concepts of reliability and its uses?
17. Write short notes on the following:  
(a) Dynamic programme applications to Civil Engineering  
(b) Monte Carlo simulation  
(c) Sensitivity analysis

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