

Total No. of Printed Pages:2

SUBJECT CODE NO:- H - 228
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil/Mech/EE/ECT)
Elective-II : SAP Material Management - II
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i. Question no. 1 and question no. 6 compulsory.
 - ii. Solve any two questions from remaining question from each section A and B.

Section A

- | | | |
|-----|---|---------------------|
| Q.1 | What is inventory management? Explain with scope and features. | 10 |
| Q.2 | <ol style="list-style-type: none"> a) What are different features of good receipt? Explain b) Explain planning goods receipt using purchase order. | <p>08</p> <p>07</p> |
| Q.3 | <ol style="list-style-type: none"> a) What are different levels of stock transfer? Explain. b) What is the difference between stock transfer and transfer posting? | <p>08</p> <p>07</p> |
| Q.4 | <ol style="list-style-type: none"> a) What is invoice verification? Explain its terms. b) Explain invoice verification with the help of block diagram. | <p>08</p> <p>07</p> |
| Q.5 | <p>Write short note on (any three)</p> <ol style="list-style-type: none"> a) Version management b) Inventory sampling c) Delivery completed indicator. d) Vendor consignment. e) Subcontracting. | 15 |

Section B

- | | | |
|-----|---|---------------------|
| Q.6 | What is physical inventory? Explain scope and function. | 10 |
| Q.7 | <ol style="list-style-type: none"> a) Explain procedure of creating and processing physical inventory documents. b) What is account assignment category in material management? | <p>08</p> <p>07</p> |
| Q.8 | <ol style="list-style-type: none"> a) How to create material master data? b) Explain procedure of creating and processing physical inventory documents. | <p>08</p> <p>07</p> |
| Q.9 | <ol style="list-style-type: none"> a) What is meant by account determination in SAP material management? b) How to configure account determination? | <p>08</p> <p>07</p> |

Q.10 Write short note on (any three)

- a) Periodic processing
- b) Split valuation
- c) Field selection in material master
- d) Valuation class
- e) SAP stock overview

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-217
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Elective-II : Pavement Design
(REVISED)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- i) Attempt any three questions from each section.
 - ii) Assume suitable data wherever necessary.
 - iii) Figures to the right indicate full marks.

Section A

- | | | |
|-----|--|----|
| Q.1 | a) Explain Boussineg's theory for pavement analysis in detail with its limitation. | 06 |
| | b) Explain different types of traffic loading considered in design of pavement. | 07 |
| Q.2 | a) Design a tie bar system for C.C. pavement from following data. | 07 |
| | i) Slab thickness = 22 cm | |
| | ii) Slab width = 3.5 m | |
| | iii) No. of lane = 02 | |
| | iv) Coefficient of friction between slab and subgrade = 1.5 | |
| | v) Weight of slab = 480 kg/cm ² | |
| | vi) Allowable working stress in steel = 1400 kg/cm ² | |
| | vii) Permissible bond stress = 24 kg/cm ² | |
| | b) Explain following term | 06 |
| | i) Serviceability | |
| | ii) Reliability | |
| Q.3 | a) Explain different types of pavement along with advantages and disadvantages. | 07 |
| | b) What is mechanistic method? Explain finite element model for design of flexible pavement. | 06 |
| Q.4 | a) Design a rigid pavement by IRC method from following data | 07 |
| | 1) Design wheel load = 4100 kg | |
| | 2) Design traffic (commercial) = 250 vehicle/day | |
| | 3) Design period = 20 year | |
| | 4) Traffic growth = 7.5% | |
| | 5) Difference in temperature = 29°C | |
| | 6) Modulus of subgrade reaction = 4.5 kg/cm ³ | |
| | 7) Modulus of elasticity for concrete = 2.5 × 10 ⁵ kg/cm ³ | |
| | 8) Modules ratio = 0.15 | |
| | 9) Coefficient of thermal expansion = 8 × 10 ⁻⁶ /°C. | |

- b) For design of flexible pavement calculate average resilience modulus (Mr) using ASHTOO method from following data. 06

Month	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Mr	2000	2000	4500	4500	4500	6000	6000	8000	8500	9000	9000	12000

- Q.5 Write notes on following
- i) ASHTOO road test 05
 - ii) Types of pavement 05
 - iii) Radius of relative stiffness 04

Section B

- Q.6 a) Explain the term drainage coefficient and load terms for coefficient (J) used in AASHTOO rigid pavement design. 06
 b) Explain different types of joint with neat sketch used in Rigid pavement. 07
- Q.7 a) Explain South African method of composite pavement design in detail. 06
 b) What is composite pavement? Explain its merits and demerits. 07
- Q.8 a) Write a note on pavement type selection processes. 07
 b) Explain different factors involved in pavement cost and benefits. 06
- Q.9 a) Enlist different methods of economic analysis of highway. Explain any one in detail. 07
 b) Explain French method of composite pavement design. 06
- Q.10 Write a note on following
- i) Life cycle cost analysis 05
 - ii) Temperature stresses in concrete pavement 05
 - iii) Vehicle operation cost 04

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-216
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Elective-II : Advanced Structures
(REVISED)

[Time: Four Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
- 1) Answer any Two from Section A & Section B.
 - 2) Assume suitable data if necessary.
 - 3) Figures to the right indicate the maximum marks.
 - 4) Use of non-programmable calculator is allowed.
 - 5) Use of IS: 456-2000, is permitted.

Section A

- Q.1 A building rests on six columns 500mm diameter arranged as shown in fig.01. Each central column carried a load of 1000 KN & the end column carry 600KN each. Design main beam ABC & secondary beam BE of the raft foundation. Consider total wind load moment of 1000 KN-M. SBC of soil is 75 KN/M² use M-25 & Fe-415. 20

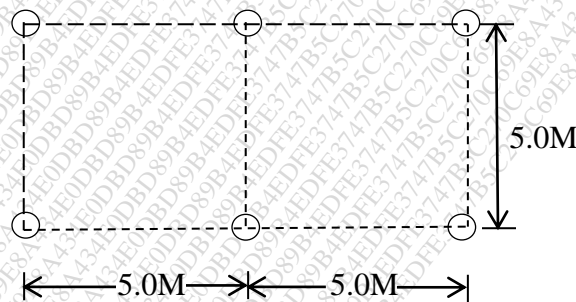


Fig.1

- Q.2 A 600mm square column is supported on four piles of 300mm diameter each. The Centre of each pile is located at 0.5M from the central column. The column carries a service load of 1000KN & moment of 75KN-M. There is a moment of 250KN-M due to wind acting in any direction at a time. Design the pile cap use M25, Fe500 grades. 20
- Q.3 A cylindrical water tank is 6.5M in diameter. Contains water up to a height of 2.8M excluding free board. Tank rests on a ring beam at a bottom 6.5M diameter. Dead weight of various components of water tank excluding water load transferred to ring beam is 75 KN/M. Design the ring beam. Use free board 0.2M. Use M-20 & Fe-415. The ring beam is supported by eight beam is supported by eight symmetrically placed columns. Show the reinforcement details. 20

No.of columns	2Ø	β _s	β _m	β _T	Ø
08	45	0.066	0.033	0.005	9.5°

Section B

- Q.4 a) Explain the following terms with reference to bridges. 10
- 1) Distribution of wheel load on slab
 - 2) Dispersion of load along span.
 - 3) Ground contact area
 - 4) IRC loading
- b) Derive the relation for edge shear in folded plates. 10
- Q.5 a) Explain the various types of transmission towers & their utility in load resistance 10
- b) Explain following terms 10
- 1) Solidity ratio
 - 2) Guyed towers
 - 3) Lattice towers
- Q.6 a) A reinforced concrete deep girder is continuous over span of 9.0M apart from Centre to Centre. It is 4.5M deep & 300MM thick & the column are 900MM width, If the girder support's a uniformly distributed load at 225KN/M including its own weight Design the beam, Using M-20 concrete & Fe-415 steel. Show reinforcement in detailed. 12
- a) Compare the design of deep beam by British code & American code. 08

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-337
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Water Resources Engineering-II
(REVISED)

[Time: Three Hours]

[Max.Marks: 80]

Please check whether you have got the right question paper.

N.B

- 1) Question No.1 and 6 are compulsory.
- 2) Solve any two questions from the remaining questions from each section.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data if necessary.

Section A

- | | | |
|-----|--|----------|
| Q.1 | Solve any Five. | 10 |
| | <ol style="list-style-type: none"> a) Define reservoir capacity, what are the types of reservoir? b) What do you meant by instrumentation in gravity dam? c) List out causes of failure of Earth dam. d) What are the forces acting on arch dam? e) Give the advantages and disadvantages of buttress dams. f) List out various types of arch dam. g) Define Gravity dam & forces acting on it with neat sketch. h) What is the safety measures required to control of cracking in concrete dam? | |
| Q.2 | <ol style="list-style-type: none"> a) Differentiate clearly between a flood control reservoir and a multipurpose reservoir. b) Briefly describe as to how you would fix the storage capacity of a reservoir and the height of the dam required for this storage. | 08
07 |
| Q.3 | <ol style="list-style-type: none"> a) Distinguish clearly between a low gravity dam and high gravity dam. Derive the expression used for such a distinction. b) A masonry dam 6m high is 1.5m wide at top and 4.5m wide at bottom, with vertical water face. Determine the normal stresses at the toe and heel for reservoir empty & full conditions. Take $\rho = 2.4$ and $C=1$. | 08
07 |
| Q.4 | <ol style="list-style-type: none"> a) Explain with neat sketch, the component parts and their functions of an Earth dam. b) Explain in detail. <ol style="list-style-type: none"> i. Seepage control measures. ii. Slope protection. | 08
07 |
| Q.5 | Write short notes <ol style="list-style-type: none"> i. Swedish circle method of slope stability. ii. Thin cylinder theory. iii. Massive head type. | 15 |

Section B

- Q.6 Solve any Five. 10
- a) Explain Saddle siphon spillway.
 - b) Draw a neat sketch of Energy dissipater sloping apron party above & party below the ground level.
 - c) Note down defects in Lacey's theory.
 - d) Give the classification of canals.
 - e) Define alluvial & non alluvial soils.
 - f) Enlist roughening devices used in canal.
 - g) Explain the function of modules.
 - h) List out types of canal falls.
- Q.7 a) Enumerate the different types of spillways, and draw neat sketches for all the types showing the different parts of each. 08
- b) Design an irrigation channel to carry 50 cumecs of discharge. The channel is to be laid at a slope of 1 in 4000. The C.V.R. of the soil is 1.1. Use kutter's rugosity coefficient as 0.023. 07
- Q.8 a) Discuss with neat sketches, the three different types of aqueducts which can possibly be constructed depending upon the size of the drainage. Also discuss the factors governing the choice of any of these three types of aqueducts. 08
- b) Write a note on Bligh's Creep theory. 07
- Q.9 a) What is a transition? What is its purpose? Discuss various methods for the design of transition. 08
- b) Explain with neat sketch. 07
- i. Vertical drop weir.
 - ii. Roughening devices.
- Q.10 Write short notes. 15
- a) Modules & their functions.
 - b) Dam outlets and intakes.
 - c) Limitations of Kennedy's theory.

Total No. of Printed Pages:2

SUBJECT CODE NO: H-372
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Design of Structures-III
(REVISED)

[Time: Four Hours]

[Max.Marks: 80]

Please check whether you have got the right question paper.

- N.B
- i) Answer any two from Section A and Section B
 - ii) Assume suitable data if necessary
 - iii) Figure to right indicate the maximum marks
 - iv) Use of non-programmable calculator is allowed
 - v) Use of IS: 456, IS:3370, IS:875 is permitted

Section A

- Q.1 a) Explain the advantages and disadvantages of flat slab construction 03
- b) Design an interior panel of flat slab without drop. The dimensions of panel are $4.0m \times 5.0m$. Diameter of column is 400mm. live load intensity $5KN/M^2$ and floor finish load $1.0KN/M^2$ use M 25, fe-500 grades. Also show the reinforcement in details 17
- Q.2 Design a combined rectangular footing for two columns A and B carrying a ultimate loads of 1500KN and 1000KN respectively. Column A is $300mm \times 300mm$ in size and column B is $400mm \times 400mm$ in si. The c/c spacing of the column is 3.5m. SBC may be taken as $150 KN/M^2$. Adopt M20 concrete and fe-500 steel. Draw sketch of reinforcement in detail 20
- Q.3 Design a cantilever retaining wall to support a bank of earth 5.0 M high above the earth level at the toe of the wall. Earth density- $17 KN/M^3$, angle of internal friction 35^0 , coefficient of friction between concrete and soil 0.45, bearing capacity $150 KN/M^2$. Use M20 mix and Fe-415 grade steel 20

Section B

- Q.4 a) Differentiate between prestressed concrete and reinforced concrete 07
- b) Explain the various types of losses in prestress concrete. Give brief account of losses in percentage 07
- c) Explain the necessity of using high grade material in prestressed concrete. 06

- Q.5 a) A circular tank capacity 400 kiloliters and 3m water height. Design the flexible base water tank using M30 grade concrete and Fe-415 grade steel. 07
- b) A reinforced concrete tank is $6.0\text{m} \times 3.0\text{m}$ with a maximum depth of 2.5 m of water, tank rests on grounds, $150\text{mm} \times 150\text{mm}$ splays are provided at the junction of walls and base slab. Design the tank use M20 & Fe-500 grades 13

Q.6 Design the formwork for the beam and slab floor, for the following data. 20

1. Thickness of floor: 120mm
2. Centre to centre spacing of beams = 3m
3. Width of beam = 300 mm and depth 400mm below slab
4. Height of ceiling of the roof = 3.5 m above the floor.

Take live lode on sheathing equals 4000 N/M^2 and dead weight of wet concrete is 26500 N/M^3

Permissible bending stress in bending & tension	10.2 N/MM^2
Permissible compressive stress parallel outside	7.0 N/MM^2
Permissible compressive stress perpendicular outside	2.1 N/MM^2
Permissible shear stress	1.0 N/MM^2

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-218
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Elective – II : Earthquake Engineering
(Revised)

[Time: Three Hours]

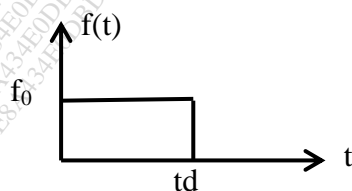
[Max. Marks: 80]

Please check whether you have got the right question paper.

- N.B
- i) Q.No.1 and Q.No.6 are compulsory.
 - ii) Attempt any two questions from the remaining questions in each section.
 - iii) Assume suitable data if necessary.
 - iv) Use of IS 1893-2002, IS 4326, IS 4327, IS 4328, IS 13920-1993 are permitted.

Section A

- Q.1 Explain the following terms 10
- i) Single degree of freedom system
 - ii) Natural frequency
 - iii) Dynamic equilibrium
 - iv) Seismic zones in India
- Q.2
- a) Write a short note on surface waves with neat sketch. 08
 - b) Enlist and explain the errors in strong ground motion recording. 07
- Q.3
- a) A structure is modeled as a damped oscillator with spring constant $K = 30 \times 10^3 \text{ N/m}$ and undamped natural frequency $= 17 \text{ rad/s}$ experimentally, it was found that a force 1 kN produced a relative velocity of 4 m/s in the damping element. 10
 Find: i. the damping ratio
 ii. the damped period T_d
 iii. the logarithmic decrement δ
 iv. the ratio between two consecutive amplitudes
 - b) Write a short note on seismic zones in India. 05
- Q.4
- a) What are the effects of surface topography on earthquake waves? 08
 - b) Enlist and explain the errors encountered in the evaluation of response spectra. 07
- Q.5
- a) Find the response of undamped single degree of freedom system subjected to rectangular pulse force as shown below by Duhamel Integral function. 10



b) What are the causes of earthquake?

05

Section B

Q.6 Explain the following terms:

10

- i) Shear wall structural system
- ii) Structural ductility
- iii) Structural stiffness
- iv) Seismic dampers

Q.7 a) How is seismic weight of the structure different from actual weight of the structure?

05

b) A planar frame having planar dimensions $10m \times 20m$ is having four storeys. Each story has a height of 3.6m. First three storeys each carries live load and dead load of 2.4 kN/m^2 and 8 kN/m^2 respectively. Roof (top) story carries live load of 1.5 kN/m^2 and dead load of 4.5 kN/m^2 . determine seismic weight of the structure and base shear as per the guidelines of IS 1893 -2002 (Part I)
 Take zone III; response reduction factor =5;
 Importance factor = 1.5;
 Frame is having no infill walls and is composed of RCC.

10

Q.8 a) Describe plan irregularities in a building.

07

b) Describe in detail the category of landslide;
 Disrupted slide and falls.

08

Q.9 a) When a building is said to be torsionally irregular?

08

b) Enlist typical design guidelines to be used for beam design per IS 13920-1993.

07

Q.10 a) Describe any one method to determine the stability of sloping ground.

07

b) Describe in brief, an which criteria's liquefaction susceptibility depends?

08

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-146
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Construction Management
[REV]

[Time: Three Hours]

[Max.Marks: 80]

N.B Please check whether you have got the right question paper.
 i) Solve any three questions from each section.
 ii) Assume suitable data where necessary and mention it clearly in the answer sheet.

SECTION – A

- Q.1 a) Discuss the importance of construction project management and its relevance. 07
 b) Discuss organizational breakdown structure in detail. 06

- Q.2 a) What are the advantages and disadvantages of using machineries in Indian construction industry? 07
 b) Differentiate between bar chart and mile stone chart. 06

- Q.3 a) Following activity relationships are given in table below, draw the network and number the events as per Fulkerson’s rule. 08

Activity	A	B	C	D	E	F	G	H	I	J
Immediate Predecessor	--	A	A	A	C	B	D,E	C	F,G	H,I

- b) Write short note on project monitoring and control. 05

- Q.4 a) Explain various stages of project management. 07
 b) Explain milestone chart, what are the merits and demerits of milestone chart? 06

- Q.5 Draw the following network and compute earliest start time, earliest finish time, latest start time, latest finish time and total float also determine total project duration and locate critical path. 14

Activity	1-2	1-3	2-4	3-4	3-5	4-5	4-6	5-6	6-7
Duration (Weeks)	5	2	2	4	3	6	4	2	5

SECTION – B

- Q.6 a) What is safety? How do you ensure safety at construction site? 07
 b) Enlist different project management software’s. explain the any two in detail. 06

- Q.7 a) Explain the phases of capital budgeting. 07
 b) What are different functions of material management? 06

- Q.8 a) Discuss some effective methods of organizational communication. 07
b) Explain ABC analysis in detail. 06
- Q.9 a) What is the importance of human resource in construction organization? 07
b) Discuss working capital in detail. 06
- Q.10 a) Explain upward, downward and horizontal communication in detail. 07
b) Explain the importance of material management in construction projects. 07

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-113
FACULTY OF SCIENCE & TECHNOLOGY
B.E. (Civil)
Structural Mechanics
(Revised)

[Time: Three Hours]

[Max. Marks:80]

- N.B Please check whether you have got the right question paper.
1. Solve ANY THREE questions from SECTION A & SECTION B each.
 2. Use of non programmable calculator is permitted.
 3. Make any suitable assumption if required & State it clearly.
- SECTION – A**
- Q.1 A. The Displacement field for a structure under the test is defined by: $u = x.y.z, v = x + y + z, w = x^2 + y^2 + z^2$. Find the strain at the point (1,2,3). $E = 2 \times 10^5 \text{N/mm}^2$, $\mu = 0.25$. 07
- B. The state of Stress at a Point is given by: 07
 $\sigma_{xx} = x^2y + 20, \sigma_{yy} = x^3z + y^2, \sigma_{zz} = yz^2 + 10, \tau_{xy} = 3x^2y, \tau_{yz} = yz, \tau_{zx} = xz$. Find the body forces distribution at point (2, 4, 6) so that stresses are in equilibrium. Also find strain at the point. $E = 2.1 \times 10^5 \text{N/mm}^2, \mu = 0.3$.
- Q.2 Derive with usual notations, governing differential equation for deflected shape of cylindrical bending of thin rectangular plate. 13
- Q.3 Derive governing differential equation of bending analysis of circular plates subjected to udl q per unit area. 13
- Q.4 Find the traverse deflection w for the simply supported circular plate with hole of radius a subjected to shearing forces along the inner boundaries. Hence find the expression of M_r and m_θ . 13
- Q.5 Find the Principal stresses and Direction of Principal Planes for the state of 13

$$\text{Stress} = \begin{bmatrix} 16 & -5 & -4 \\ -5 & 10 & 6 \\ -4 & 6 & 8 \end{bmatrix} \text{N/mm}^2$$

Section B

Q.6 Analyse the beam ABCD shown in figure 1 by Stiffness Method. Support A is fixed and Support B, C and D are simple supports. 14

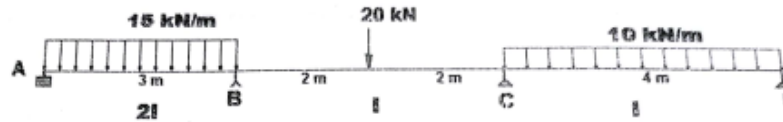


Figure No. 1

Q.7 Explain Various Approaches used in FEM. Explain Energy Approach and Variation Approach with suitable example. 13

Q.8 A. What do you understand by degree of static indeterminacy and degree of kinematic indeterminacy? Explain with at least one example of beam and frame each. 06

B. Differentiate between flexibility matrix Method and Stiffness matrix method of Structural Analysis. 07

Q.9 Explain membrane theory of thin cylindrical shells in details and hence derive equations for membrane forces in cylindrical shells. 13

Q.10 A. Give stepwise procedure of analysis of structures using flexibility method. 07
 B. Explain convergence criteria in finite element method of analysis. 06

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-219
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Elective – II : Industrial Waste Treatment
(Revised)

[Time: Three Hours]

[Max.Marks:80]

- N.B Please check whether you have got the right question paper.
1. Q.No.1 and Q.No.6 are compulsory.
 2. Answer any two questions among the remaining questions (i.e. 2 to 5) of section A and any two questions (i.e. 7 to 10) of section B.
 3. Assume suitable data if necessary.
- Section A
- Q.1 Answer the following questions. 10
- a) Enlist ISI effluent standards for disposal of waste water.
 - b) State importance of water pollution control Act.
 - c) Explain BOD.
 - d) Enlist the Physical pollutants in waste water.
 - e) Explain “waste exchange”
- Q.2 a) Discuss the impact of industries wastewater on sewers and municipal sewage treatment plants. 08
- b) A town discharges 50 cumecs of sewage having a rate of flow of 1200 cumecs during lean days, at a 5 day BOD of sewage at the given temperature is 250 mg/l. find the amount of critical DO deficit and its location in downstream portion of stream. Assume deoxygenating coefficient k as 0.1 and coefficient of self-purification (f_s) as 3.5. Assume saturation DO at given temperature as 8.2 mg/l 07
- Q.3 a) Write brief on: 1. Volume reduction 2. Equalization 3. Strength reduction 07
- b) Compare Environmental Audit and EIA. 08
- Q.4 a) Explain in detail the Streeters Phelps dissolved oxygen model. 07
- b) Explain the function of CPCB and SPCB. 08
- Q.5 Write Short Notes on (any three) 15
- a) MPCP
 - b) EIS
 - c) Oxygen sag curve
 - d) Self-purification of stream

Section B

- Q.6 Answer the following questions. 10
- Explain Detention period.
 - Describe F/M ratio
 - Give the full form of following abbreviation: 1.HRT 2.OLR
 - What is SVI?
 - Enlist disposal methods of radioactive waste.
- Q.7 a) Explain in detail the “Chemical Precipitation” for treating industrial waste. 08
 b) Explain in detail on oxidation pond with neat sketch. 07
- Q.8 a) Explain waste water characteristics and treatment process in Sugar industry. 08
 b) Explain design consideration of ASP in detail. 07
- Q.9 a) Explain the treatment process of paper and pulp industry. 07
 b) What are nitrification and de nitrification in industrial effluent treatment process? 08
- Q.10 Write short notes on (any three) 15
- UASBR
 - Air Stripping
 - RO
 - Ion Exchange

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-220
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Ele-II : Geographic Information Systems
(Revised)

[Time: Three Hours]

[Max.Marks:80]

Please check whether you have got the right question paper.

- N.B
1. This question paper contains 10 questions divided into two sections, namely A and B.
 2. Attempt three questions from each section.
 3. Q.No.1 from section A, and Q.No.6 from section B are compulsory.

Section A

- Q.1 Answer any five questions out of the following: (2 marks each) 10
- a) What are the different components of a GIS?
 - b) Define GIS.
 - c) What are rasters and vectors?
 - d) Define generalization.
 - e) What is a datum?
 - f) List the different types of projections.
 - g) What are the different parameters of a datum transformation?
- Q.2 Write a detailed note on the different coordinate systems for mapping. 15
- Q.3
- a) What are the advantages of digital representation of data? 07
 - b) What is the role of generalization in the digital representation of data? Illustrate with an example. 08
- Q.4 Explain the concept of digital objects and continuous fields. 15
- Q.5 Explain the requirement of projections based on a suitable area. 15

Section B

- Q.6 Answer any five questions out of the following: (2 marks each) 10
- a) What are primary and secondary geographic data?
 - b) How are attributes captured?
 - c) Define geovisualisation.
 - d) Name few GIS software.
 - e) What are the principles of map design?
 - f) What is a spatial query?
 - g) Define consolidation?

- Q.7 a) Explain spatial queries and illustrate them with examples. 08
b) Write a short note on the applications of cartography. 07
- Q.8 Write a descriptive note on the role of GIS in water resources management. 15
- Q.9 Write a descriptive note on Spatial Analysis with an illustrative example. 15
- Q.10 Describe three applications of GIS in various areas. 15

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-303
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Environmental Engineering-II
(Revised)

[Time: Three Hours]

[Max.Marks: 80]

Please check whether you have got the right question paper.

- N.B
1. Q.1 and Q.6 are compulsory.
 2. Attempt any two from remaining questions.

Section A

- | | | |
|-----|--|---------------------|
| Q.1 | Attempt any five | 10 |
| | <ol style="list-style-type: none"> a) Define <ol style="list-style-type: none"> I. Non –Scouring velocity II. Self- cleaning velocity b) Explain BOD c) Enlist Physical Characteristics of waste water d) Enlist type of sewer material e) Crown Corrosion f) DWF and WWF | |
| Q.2 | <ol style="list-style-type: none"> a) What do you mean by sedimentation? Why it is necessary to provide sedimentation? Explain the configuration of sedimentation tank with neat sketch? b) Design a grit chamber for a minimum wastewater flow of $8000 \text{ m}^3/\text{day}$ to remove particle up to of 0.2 mm diameter, having specific gravity of 2.65. The settling velocity of these particles is found to change from 0.018- 0.022 m/sec. maintain a constant flow through velocity of 0.3 m/sec through the provision of a proportional flow weir. | <p>07</p> <p>08</p> |
| Q.3 | <ol style="list-style-type: none"> a) What are sewer appurtenances? Describe the functions of different types of sewer appurtenances used in sewerage system. b) Explain Physical, Chemical and Biological characteristics in details with the examples. | <p>07</p> <p>08</p> |
| Q.4 | <ol style="list-style-type: none"> a) The BOD of a sewage incubated for one day at 30°C has been found to be 100mg/l. what will be the 5 day 20°C BOD? Assume $K = 0.12$ (Base 10) at 20°C. b) Explain in detail the Oxygen Sag Curve. | <p>07</p> <p>08</p> |
| Q.5 | Write short Note (any three) | 15 |
| | <ol style="list-style-type: none"> 1) Draw a Layout of sewage treatment 2) Drop manhole | |

- 3) Clogging of sewer
- 4) Egg shaped sewer
- 5) Classification of Water Carriage System

Section B

- Q.6 a) The sewage flows from a primary settling tank to a standard rate trickling filter at a rate of 6 MLD having a 5-day BOD of 150mg/l. Determine the depth and the volume of filter, adopting a surface loading of 2500 l/m²/day and an organic loading of 165 g/m³/day. Also, determine the efficiency of the filter unit, using NRC formula. 05
- b) Explain working of oxidation pond. 05
- Q.7 a) Explain unit operation and unit process with examples. 07
- b) Compare between low rate and high rate trickling filter 08
- Q.8 Design a conventional activated sludge for waste flow = 70000³/d 15
 Volume of aeration tank = 1600m³
 Influent BOD = 200mg/l
 Effluent BOD = 20mg/l
 MLSS = 3000 mg/l
 Effluent SS = 40 mg/l
 Waste sludge SS = 12000mg/l
 Quantity of waste sludge = 300m³/d
 Based on above information, determine
1. A.T (hours)
 2. F/M ratio
 3. Percentage efficiency of BOD removal
 4. Sludge age (days)
- Q.9 a) What is composting? Discuss various processes and phases of composting. Write about various factors which affect composting. 07
- b) What is recovery and recycling of solid waste? Least out the operations involved in recycling? 08
- Q.10 Write short note (any three) 15
1. Septic Tank
 2. UASBR
 3. Nitrogen Removal
 4. RO

Total No. of Printed Pages: 02

SUBJECT CODE NO:- H-406
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Foundation Engineering
(Revised)

[Time: Three Hours]

[Max. Marks: 80]

Please check whether you have got the right question paper.

- N. B
- i) Attempt any three questions from each section.
 - ii) Draw neat diagram whenever required.
 - iii) Assume suitable data if necessary.

SECTION A

- Q. 1
- a) Explain different causes of foundation settlement. 06
 - b) Explain plate load test with neat sketch. 07
- Q. 2
- a) Explain electric resistivity method with neat diagram in detail. 08
 - b) Define & explain 05
 - a. General shear failure.
 - b. Local shear failure.
- Q. 3
- a) Determine safe bearing capacity of rectangular footing $1.2m \times 1.6m$ resting on $c - \phi$ soil. 07
 At depth 1.7m from ground surface. The cohesion for soil is $40kN/m^2$ & $\phi = 25^\circ$. The water table is available at depth of 1.8m from ground surface.
 For $\phi = 25^\circ$ $N_c = 25.1$, $N_q = 12.7$ $N_y = 9.7$.
 - b) Explain Meyerhof's theory of bearing capacity. 06
- Q. 4
- a) Explain different type of raft with neat sketches. 06
 - b) A raft is support a structure carrying a total load of 28000kN. Over an area of $12m \times 15m$. 07
 The allowable soil pressure of the soil is $80kN/m^2$ & unit weight (γ) = $18kN/m^3$ design suitable depth of raft considering effect of floating foundation.
- Q. 5 Write note on following
- i) Design procedure of strap footing. 05
 - ii) Proportioning of footing for equal settlement 05
 - iii) Consolidations settlement. 04

SECTION B

- Q. 6
- a) Explain circular & diaphragm type cellular coffer dam with neat sketch. 06
 - b) Explain approximate analysis of cantilever sheet pile wall in granular soil. 07

- Q. 7 a) Explain the classification of pile on the basis of function. 06
 b) Design a friction group of pile to carry a load of 3800kN including weight of pile cap, in dry Layer of depth 25m, the unconfined compressive strength of soil is 64kN/mm^2 . A factor of safety of 2.5 is required. 07
- Q. 8 a) Compare between precast & cast in situ piles. 06
 b) Explain dynamic analysis pile. Drive explains ENR formula. 07
- Q. 9 a) Explain construction of ‘hand excavated’ pier by 06
 i) Gow’s method &
 ii) Chicago method
 b) Explain different difficulties in sinking of caisson with remedial measure. 07
- Q. 10 Write note on
 i) Negative skin friction. 05
 ii) Slurry method for drilled pier. 04
 iii) Uses of sheet pile. 05

Total No. of Printed Pages:3

SUBJECT CODE NO:- H-445
FACULTY OF SCIENCE & TECHNOLOGY
B.E. (Civil)
Elective – I : Prestressed Concrete
(Revised)

[Time: Four Hours]

[Max. Marks: 80]

- N.B Please check whether you have got the right question paper.
1. Solve any three questions from section A and B each.
 2. Use of IS 1343 and IS 456-200 is allowed.
 3. Assume suitable data where required and mention it clearly.
 4. Draw neat sketches in justification where necessary.
- Q.1 Answer any three of the following. 14
- 1) When the loss due to elastic shortening is considered in post tensioned PSC section. Explain in detail how it is calculated? 04
 - 2) Which are the advantages of prestressed concrete as compared to reinforced concrete? Also mention the limitations of prestressed concrete. 05
 - 3) Which are various forms of prestressing steel? Explain with neat sketches. 04
 - 4) With the help of neat sketch explain in detail “Magnel Blaton System” for prestressing. 05
- Q.2 The beam carries udl of 4.0 kN/m exclusive of its self weight. It is prestressed with 100 wires of 5 mm dia. With their centroid 110 mm above the bottom of the beam. The initial stress is 1000 N/mm² and the span of the beam is 30.0 m. Assuming 15% losses, find extreme fiber stresses at various stages at midspan. The section of the beam is as below, Top flange = 750 × 200 mm thick, web = depth 600 mm & 150 mm thick, bottom flange = 400 × 300 mm thick. 13
- Q.3 a) A PSC beam 300 mm wide and 600mm deep is prestressed with the tendons of area 300 mm² located at a constant eccentricity of 110 mm and carrying initial stress of 1000 N/mm². The span of the beam is 10.0m. calculate the % loss of prestress in tendons if, 11
- i) The beam is pretensioned and
 - ii) The beam is post tensioned, using following data.
 Modular ratio = 6, anchorage slip = 1.50 mm, friction coefficient for wave effect = 0.0015/m, creep coefficient = 2.2, shrinkage of concrete = 300 × 10⁻⁶ and 200 × 10⁻⁶ for pre and post tensioned member, relaxation of steel = 3%.
- b) How the losses are broadly classified as immediate and time dependent losses? Further differentiate the losses for pre and post tensioning. 02
- Q.4 a) A rectangular concrete beam of 200mm × 350mm deep is prestressed by 15 × 5mm dia. Wires located at 70 mm from bottom of beam and 3 × 5mm dia. Located at 25mm from the top. Assuming the effective stress in the wires as 850 N/mm², 11
- i) Calculate the stresses at extreme fiber at the mid span section when the beam is

- carrying its own weight over the span of 6.0m
- ii) If uniformly distributed working load of 6.0kN/m is imposed and the modulus of rupture of the concrete is 6.50N/mm^2 , obtain maximum working stress in concrete and estimate the load factor against cracking. Assume density of concrete as 25kN/m^3 .

b) Explain the terms upper and lower kern points with the help of neat sketch. 02

- Q.5 a) Explain stress distribution of end block as per Guyon's method single and double anchor plate is used. 04
- b) The end block of a prestressed concrete beam, rectangular in section is 120mm wide and 300mm deep. The prestressing force of 250kN is transmitted to the concrete by a distribution plate 20mm wide and 75mm deep, concentrically located at the ends. Calculate the position and magnitude of maximum tensile stresses on the horizontal section through the center of the end block using Guyons method. Compute the bursting tension on these horizontal planes and required reinforcement for the same. Consider following data. 09

Distribution ratio	Position of zero stress	Position of maximum stress	Ratio of max to average stress
0.2	0.14	0.30	0.36
0.3	0.16	0.36	0.33
0.4	0.18	0.39	0.27

Section – B

Q.6 Answer any three of the following 14

- 1) How moment of resistance is calculated as per Indian code provisions for rectangular and flanged section for prestressed concrete section. 05
- 2) What are the different types of flexural failure? Explain in detail with stress diagram under reinforced failure of the section 04
- 3) Explain the need of providing minimum shear reinforcement in any of the section. Hence explain the web shear cracks failure in PSC member. 05
- 4) Draw at least four typical composite cross sections frequently used in field clearly indicating precast and cast in situ components of the structure. 04

Q.7 a) Write down step by step procedure for design of composite section. 03

- b) Design a panel of post tensioned pretressed concrete two way slab $6 \times 8\text{m}$ in size to support a live load of 3.0 kN/m^2 . If the cables of 4 wires of 5mm dia. Stressed to 1000N/mm^2 is available for use, determine the no. of cables in two principal directions. The stress in concrete not to exceed 14 N/mm^2 in compression and tensile stresses are 10

not permitted under service load. The load ratio is 0.80.

- Q.8 a) A PSC beam of symmetrical I section has an overall depth of 1.90m, thickness of web 210mm. The effective span of the beam is 40.0m. The beam is prestressed by the cables which are concentric at support and have eccentricity of 720mm at eth center of the span. The force in the cable is 12100 kN at transfer stage, the characteristic strength of the concrete is $60 N/mm^2$. Estimate the ultimate shear strength at support section. If the ultimate shear force at the support due to external loading is 2850 kN and the loss ratio is 0.85, design suitable shear reinforcement using Fe415. Assume area of section $0.88 \times 10^6 mm^2$. 07
- b) A PSC beam of rectangular section 400mm wide and 1000mm overall depth is prestressed by $800 mm^2$ of Ht wires at an eccentricity of 300mm. If $f_{ck} = 40 N/mm^2$ And $f_p = 1600 N/mm^2$, then estimate the ultimate flexural strength of the concrete using IS 1343. 06
- Q.9 a) Explain how prestressed concrete poles are superior for use as compared to other material poles? 03
- b) A PSC pipe of 1.10 m dia. And thickness of 75mm is used to withstand service pressure of $1.25 N/mm^2$. Estimate the pitch of 5mm dia. HT wires if the initial stress in the steel if $1000 N/mm^2$. If Permissible stresses in the concrete are $12.5 N/mm^2$ (compressive) and 0 (tensile), loss ratio is 0.85, direct tensile strength of the concrete is $2.50 N/mm^2$, estimate load factor against cracking. 10
- Q.10 a) Design a suitable section for a tie member of a truss to support maximum design tensile force of 500kN. The permissible compressive stress in the concrete is $14.0 N/mm^2$ and no tension is permitted at working load. The loss ratio is 0.85. The wires of 7mm dia. Of ultimate strength of $1700 N/mm^2$ initially stressed to $1000 N/mm^2$ are to be used. The direct tensile strength of the concrete is to be considered as $2.50 N/mm^2$. A load factor of 1.50 at limit state of collapse and 1.25 against cracking is required. 10
- b) What is the need of composite construction? 03

Total No. of Printed Pages:3

SUBJECT CODE NO:- H-181
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Professional Practice
(Revised)

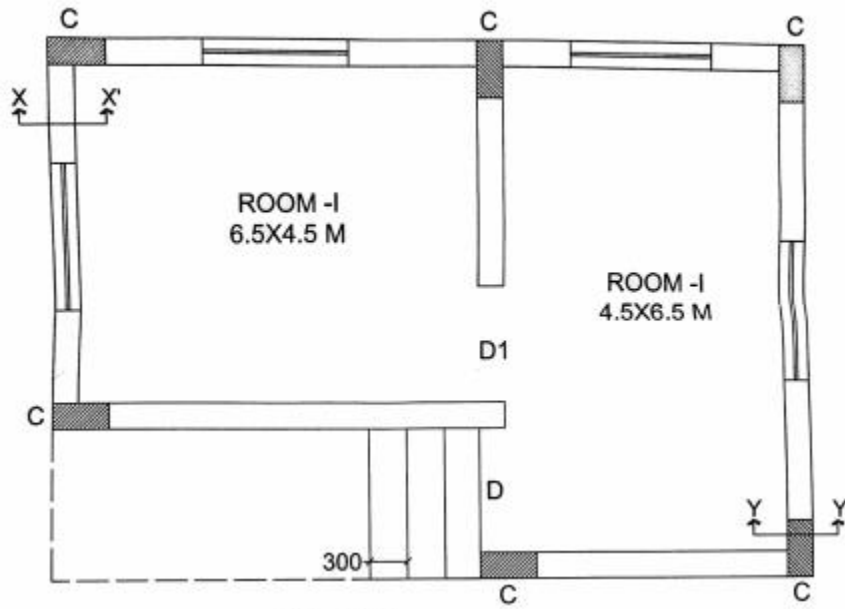
[Time: Three Hours]

[Max.Marks:80]

- N.B Please check whether you have got the right question paper.
- i) Q.No.1 is compulsory. Solve any two questions from remaining in section A.
 - ii) Attempt any three questions from section B.
 - iii) Figures to the right indicate full marks.
 - iv) Assume suitable data if required.

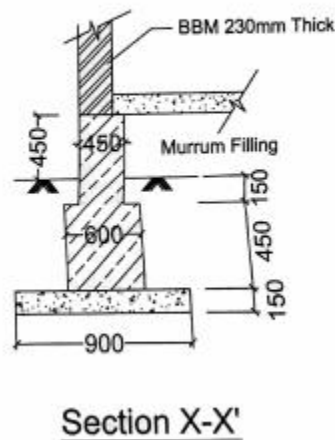
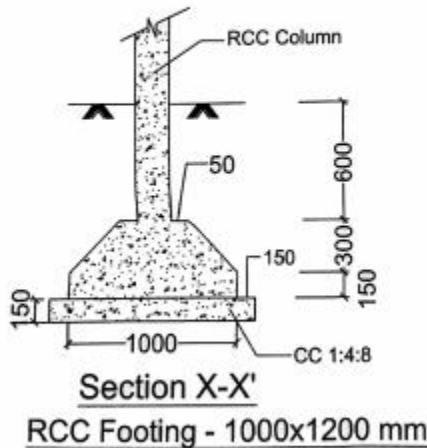
Section A

- | | | |
|-----|--|----------|
| Q.1 | Calculate the following quantities of the residential building as shown in fig.1. | 20 |
| | <ol style="list-style-type: none"> i) Excavation for column footings ii) Plain cement concrete in foundation (1:4:8) iii) RCC Footing quantity iv) Filling in plinth v) Backfilling in footing pits. | |
| Q.2 | <ol style="list-style-type: none"> a) What is IS:1200 (1974)? Give its uses along with its different parts. b) Briefly explain the different types of approximate estimates. | 05
05 |
| Q.3 | <ol style="list-style-type: none"> a) Write down the detailed specifications for the following items of works <ol style="list-style-type: none"> i) Reinforced cement concrete (RCC) ii) First class brickwork in cement mortar 1:4 in super structure | 05
05 |
| Q.4 | Carry out rate analysis for : <ol style="list-style-type: none"> i) RCC work in beams, slabs etc. 1:2:4 – per cu.m. ii) 12mm plastering 1:6 – unit 1 sq.m. Take – 100 sq.m. | 05
05 |



PLAN

Column size- 230x380 mm
NOTE: All dimensions are in mm



Section B

- Q.5 a) Describe the factors affecting the value of land and building in detail. 07
 b) What are essentials of a valid contract? Explain. 06
- Q.6 a) What is a tender? Differentiate between Tender document and contract documents. 07
 b) Explain the government procedure for execution of work with examples. 06
- Q.7 a) What is depreciation? Explain different methods of find it. 06
 b) Explain different types of percentage rate contracts. 07
- Q.8 a) Write a note on valuation of buildings. 06
 b) Write a note on administrative approval and technical sanctions. 07
- Q.9 a) Write a note on mortgage and amortization. 07
 b) Explain the documents required for new construction work. 07

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-446
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Elective – I : Town Planning
(Revised)

[Time: Three Hours]

[Max.Marks: 80]

Please check whether you have got the right question paper.

- N.B
- 1) Answer any three question from each Section.
 - 2) Q.1 & Q.6 are compulsory.

Section A

- | | | |
|-----|---|----|
| Q.1 | Attempt any five:- | 10 |
| | <ol style="list-style-type: none"> 1) What are the principles of town planning? 2) Explain beginning of civilization. 3) Explain golden age of Greece (5th Century). 4) Describe picturesque towns medieval period. 5) Describe monumental planning. 6) Explain epidemics in 19th century. 7) Explain garden city concept. 8) What is set back? | |
| Q.2 | a) Describe river valley civilization. | 07 |
| | b) What is ribbon development? What are its disadvantages? | 08 |
| Q.3 | a) Explain the concept of town planning in feudal period. | 07 |
| | b) Explain different problems arises due to urbanization. | 08 |
| Q.4 | a) What do you mean by Bye laws? How it is related with set back distance explain with an example. | 07 |
| | b) Write a short note on Dudley Report. | 08 |
| Q.5 | a) Write a short note on Barlaw Scott and Uthwatt commissions. | 08 |
| | b) Explain fire protection bye laws for residential areas. | 07 |

Section B

- Q.6 Attempt any five:- 10
- 1) Explain the distribution of land for built up areas.
 - 2) What are the methods of data collection?
 - 3) What is the necessity of surveys?
 - 4) Describe power zoning.
 - 5) Describe aesthetics of road.
 - 6) What are the features and types of recreation system?
 - 7) Explain the grouping of public building.
 - 8) Explain comprehensive planning of industrial estate.
- Q.7 a) What are the objectives & principles of zoning? 07
 b) What are the objects of Development plan? Which data has to be collected from various survey? 08
- Q.8 a) What are the stages in preparation of development plan? Also explain development plan for military town. 07
 b) What different surveys are to be carried out for data collection & preparation of maps? 08
- Q.9 a) Enlist the remedies for traffic congestion. What are the disadvantage of traffic congestion? 07
 b) Explain road junctions with the guideline to be followed for its design. 08
- Q.10 a) Explain rural housing problem in India. 07
 b) Explain the concept of smart city and its planning. 08

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-498
FACULTY OF SCIENCE AND TECHNOLOGY
B.E. (Civil)
Transportation Engineering- II
(Old)

[Time: Three Hours]

[Max.Marks:100]

Please check whether you have got the right question paper.

N.B

1. Solve two questions from each section.

Section A

- Q.1 a) What is the importance of Nagpur road plan in highway planning of our country? Explain the salient features of their plan. 10
- b) A two lane road with design speed 80kmph has horizontal curve of radius 480m. Design the rate of super elevation for mixed traffic. By how much should the outer edge of the pavement be raised with respect to the centre line of the pavement is rotated with respect to the centre line and the width of the pavement at the horizontal curve is 7.5m? 15
- Q.2 a) State and explain PIEV theory 08
- b) Discuss the effect of shape of camber? What are the effects of providing step cross slope. 07
- c) Calculate the values of 10
- i) Head light sight distance
- ii) Intermediate sight distance for a highway with a design speed of 65kmph. Assume suitable data required.
- Q.3 a) Explain super elevation. What are the factors on which the design of super elevation depends 07
- b) What engineering's surveys are to be carried out for new highway alignment? 08
- c) Explain CBR and test procedure for laboratory and field test. 10

Section – B

- Q.4 a) Explain flexible and rigid pavements and bring out the point of difference. 10
- b) Explain group index method of pavement design. What are the limitations of this method? 15

- Q.5 a) What are the general causes of pavement failure? 08
- b) Write a short note on westergrads what load stresses formula. 07
- c) What are the desirable properties of bitumen? Compare tar and bitument 10
- Q.6 a) State functional classes of traffic signs with example. 05
- b) Discuss the uses & limitations of R.C.C and prestressed concrete pavement for highway 10
- c) Explain maintenance of
- i) Bituminous surface
 - ii) Cement concrete pavement 10