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10CV61

Sixth Semester B.E. Degree Examination, June / July 2014
Environmental Engineering - I

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***
2. ***Draw sketches wherever required.***
3. ***Assume any suitable missing data.***

PART – A

1 a. Discuss the environmental pollution due to human activities. **(06 Marks)**

b. What is meant by per capita demand? List and discuss the factors that affect the per capita demand. **(06 Marks)**

c. The following is the population data of a city available from past census records. Determine the future population of the city in 2030 by i) Arithmetical increase method and ii) Geometrical increase method. **(08 Marks)**

Year	1960	1970	1980	1990	2000
Population	25,000	28,000	34,000	42,000	47,000

2 a. What are the intake structures? Explain the factors to be considered while selecting a location for intake structures?. **(06 Marks)**

b. What are the factors affecting selection of a particular type of pump? **(06 Marks)**

c. Water has to be supplied to a town with one lakh population at the rate of 150 litres per capita per day from a river 1500m away. The difference in elevation between the lowest water level in the sump and the reservoir is 28m. If the demand has to be supplied in 8 hours, determine the size of the main and the brake horse power of the pumps required. Assume maximum demand as 1.5 times the average demand. Assume f = 0.0075, Velocity in the pipe 2.4m/sec and efficiency of pump 80 percent. **(08 Marks)**

3 a. Mention the permissible limits for the following parameters and explain the environmental significance of each : Hardness, Nitrate, Fluorides and Iron. **(08 Marks)**

b. Write a note on properties of whole some water. **(06 Marks)**

c. Briefly explain the water borne diseases and their control. **(06 Marks)**

4 a. Give complete sequence of a water treatment plant with a flow diagram and mention the function of each treatment unit. **(08 Marks)**

b. Explain with chemical equations, what happens when alum is added to water? **(06 Marks)**

c. The maximum daily demand at a water purification tank plant is 8 MLD. Design the dimensions of a suitable rectangular sedimentation tank for the raw water supplies. Take detention time period of 4 hours and the depth of 3.0mts. The velocity of flow is 20cm/min. **(06 Marks)**

PART - B

5 a. Explain in detail the theory of filtration. **(08 Marks)**

b. Explain with a neat sketch working of a pressure filter? **(06 Marks)**

c. Determine the dimensions of a set of rapid gravity filters for treating water required for a population of 50,000 with average rate of demand as 180 litres per day per person. Assume a peak factor of 1.8 by ignoring wash water requirements. Assume rate of filtration is 500ℓ/h/sq.m. **(06 Marks)**

6 a. Explain the terms pre – chlorination, post – chlorination, Break point chlorination and Super chlorination. **(08 Marks)**

b. Chlorine usage in the treatment of 20,000 cubic meter per day is 8kg/day. The residual after 10 min contact is 0.20mg/ℓ. Calculate the dosage in milligrams per litre and chlorine demand of the water. **(06 Marks)**

c. Briefly explain Zeolite process of hardness removal. **(06 Marks)**

7 a. What is meant by defluoridation? Explain with a line diagram the "Nalagonda technic" of defluoridation. **(06 Marks)**

b. What is aeration? Explain the type of aerators. **(06 Marks)**

c. Describe the various methods of distribution of water and discuss the advantages and disadvantages of each. **(08 Marks)**

8 Write explanatory notes with sketch on the following :

a. Fire hydrant.

b. Air valves.

c. Sluice valves.

d. Pressure relief valves. **(20 Marks)**

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10CV62

Sixth Semester B.E. Degree Examination, June/July 2014
Design and Drawing of RC Structures

Time: 4 hrs. Max. Marks:100

Note: ***1. Answer TWO full questions from Part – A and ONE full question from Part – B.***
2. Use of IS:456–2000 and SP–16 is permitted.

PART – A

1 A simply supported two way slab is supported on all the sides by a 230 mm thick wall. The dimensions of the two way slab is 4.5m × 5.5m (clear). Following are the details of reinforcement.

i) Thickness of slab = 150 mm
ii) Along short span = # 12@ 130 mm c/c
iii) Along longer span = # 10 @ 110 mm c/c
iv) Negative steel for shorter span = # 12 @ 260 mm c/c 1.20 m long
v) Negative steel for longer span = # 10 @ 220 mm c/c 1.430 m long
vi) Alternative rods are bent up/cranked
vii) Corner mats are # 10 @ 120 mm c/c at top and bottom, in two layers on all the corners for a distance of 0.950 m on either side
viii) Use M20 grade concrete and Fe415 grade steel

Draw to a suitable scale :

a. Plan showing reinforcement details. **(08 Marks)**
b. c/s at midspan along shorter span. **(06 Marks)**
c. c/s at midspan along longer span. **(06 Marks)**

2 A RCC doglegged staircase has the following details :

i) Staircase hall size (clear) = 2.3 m × 4.7 m
ii) Floor to floor height = 3.3 m
iii) Rise = 150 mm and tread = 250 mm
iv) Waist slab thickness = 150 mm
v) Width of stair = 1.10 m
vi) Bearing = 230 mm
vii) Number of steps per flight = 10
viii) Main steel = # 12@ 250 mm c/c
ix) Distribution steel = # 8 @ 275 mm c/c

Two landing beams of size 230 mm × 250 mm are provided with 2 - # 12 at bottom and top. Stirrups are # 8 @ 200 c/c throughout.

Draw to a suitable scale :

a. Plan. **(06 Marks)**
b. Sectional elevation along second flight. **(08 Marks)**
c. Bar bending schedule. **(06 Marks)**

3 A rectangular RCC column and footing has the following details :

Column size	= 400 mm × 600 mm
Size of footing	= 2 m × 3 m of uniform thickness 420 mm
Depth of foundation below GL	= 1 m
Height of column to be shown above GL	= 1 m
Details of reinforcement	
Column	: 8 - # 16 as main bars with # 8 @ 150 mm c/c lateral ties
Footing : along length	: # 12 @ 130 mm c/c
Along width (central band)	: # 12 @ 220 mm c/c
Along width (end band)	: # 12 @ 250 mm c/c
Use M20 concrete and Fe415 steel	

Draw to a suitable scale, the following :

a. Sectional plan of column and footing. **(07 Marks)**

b. Sectional elevation of column and footing. **(08 Marks)**

c. Prepare bar bending schedule for footing steel and column steel upto 1 m above GL. **(05 Marks)**

PART – B

4 Design a slab and beam type combined rectangular footing for two columns located 4.0 m apart. The columns 300 mm × 300 mm and 500 mm × 500 mm in size carry axial service loads of 600 kN and 900 kN respectively. The property line is 0.5 m from the centre line of first column. Safe bearing capacity of soil is 150 kN/m^2. Use M20 concrete and Fe415 grade steel. **(40 Marks)**

Draw to a suitable scale :

a. Longitudinal section of the footing. **(15 Marks)**

b. Cross section of the footing. **(05 Marks)**

5 a. Design a RCC portal frame having an effective span of 8.0 m and effective height of 4.0 m. The portals are spaced at 3.5 m c/c. The imposed load on slab is 2.0 kN/m^2. Assume SBC of soil as 200 kN/m^2. The bases of columns are fixed. Use M20 concrete and Fe415 steel. Design the continuous slab, portal frame and foundation. **(40 Marks)**

b. Draw to a suitable scale the sectional elevation of half the portal frame showing the details of steel in beam, column and footing. Also show the cross-sectional details of beam at midspan and support and the sectional details of column. **(20 Marks)**

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10CV63

Sixth Semester B.E. Degree Examination, June/July 2014
Transportation Engineering – II

Time: 3 hrs. Max. Marks:100

Note: ***1. Answer FIVE full questions, selecting at least TWO questions from each part.***
2. Assume any missing data suitably.

PART – A

1 a. Explain the role of rail transportation in the development of country. **(08 Marks)**

b. Discuss the factors which govern the choice of a gauge. **(06 Marks)**

c. Define creep. What are the causes and effects of creep? **(06 Marks)**

2 a. What are the requirements of a good ballast? Mention the different types of ballast used in permanent way. **(06 Marks)**

b. Calculate the quantity of materials required for the construction of B.G. track of length 19,500 m with the rail section of 52 kg/m and standard length of 13 m. Take sleeper density as n + 4. **(06 Marks)**

c. Determine the maximum train load that can be handled by a locomotive having four pairs of driving wheel of an axial load of 28 tonnes each. On a straight track the train runs at a speed of 90 kmph. Also determine the reduction of speed the train has on upward gradient of 1 in 150. If the train moves on a upward gradient with 3° curve, what would be the reduction of speed? Take $\mu = 1/6$. **(08 Marks)**

3 a. What are the objects of providing transition curve? Explain briefly the essential requirements of an ideal transition curves. **(06 Marks)**

b. Define gradient. Mention the different types of gradients in a railway track. What is grade compensation? **(06 Marks)**

c. A 5° curve diverges from a 3° main curve in the reverse direction in the layout of a B.G. yard. If the speed on the branch line is restricted to 35 kmph, determine the restricted speed on the main line. **(08 Marks)**

4 a. Draw a neat sketch of a left hand turnout and show its various component parts. **(06 Marks)**

b. What is a marshalling yard? Explain the functions of marshalling yard with sketch. **(06 Marks)**

c. Explain briefly the working of a semaphore signal, with the help of a neat sketch. **(08 Marks)**

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10CV64

Sixth Semester B.E. Degree Examination, June/July 2014
Geotechnical Engineering – II

Time: 3 hrs. Max. Marks:100

Note: ***1. Answer any FIVE full questions, selecting atleast TWO questions from each part.***
2. Assume missing data if any.

PART – A

1 a. With a neat sketch of a sampler, define
i) Area ratio
ii) Inside clearance
iii) Outside clearance.
Also indicate recommended values. **(06 Marks)**

b. List and explain different types of samplers used in soil sampling. **(08 Marks)**

c. List the methods used for controlling ground water during excavation. Explain any one of these dewatering methods. **(06 Marks)**

2 a. List the assumptions made in Boussineq's and westergaards theories. **(06 Marks)**

b. Explain the: i) Pressure bulb; ii) Pressure distribution on horizontal plane; iii) Pressure distribution on vertical plane. **(08 Marks)**

c. A point load of 1000kN acts at the ground surface. Compute the vertical stresses at 8m depth.
i) On the axis of the load; ii) 2m away from the axis.
Use Boussineq's equations. **(06 Marks)**

3 a. What is flow net? What are its characteristics and uses? **(08 Marks)**

b. Explain with a neat sketch the method of locating phreatic line for a homogeneous earth dam without filter. **(08 Marks)**

c. Explain the terms: i) Exit gradient; ii) Piping failure. **(04 Marks)**

4 a. List the assumptions and limitations of Rankines earth pressure theory. **(04 Marks)**

b. Explain the Culmann's graphical construction for determination of active earth thrust. **(08 Marks)**

c. A retaining wall, 7.5m high retains cohesionless, horizontal back fill. The top 3m of fill has a unit weight of 18kN/m^3 and $\phi = 30°$ and the rest has a unit weight of 24kN/m^3 and $\phi = 20°$. Determine using Rankine's theory, the distribution of active earth pressure and total active earth thrust. **(08 Marks)**

PART – B

5 a. What are different types of slopes? Explain types of slope failures. What are the causes of slope failure? **(06 Marks)**

b. Explain the method of slices for stability analysis of sloper. **(08 Marks)**

c. An embankment is to be constructed with C = 30kN/m^2, $\phi = 20°$, r = 18kN/m^3, FS = 2 and height 10m. Estimate the required side slope using Taylor's stability number. **(06 Marks)**

Slope angle	90	75	60	45	30	20	10
S_n	0.182	0.134	0.097	0.062	0.025	0.005	0

6 a. Explain the different modes of shear failure with the help of neat sketch. **(06 Marks)**

b. What are the assumptions made in Terzaghi's theory? Write the expressions for ultimate bearing capacity of strip footing, square and circular footing. **(06 Marks)**

c. A strip footing 1.2m wide is supported on a soil with its base at a depth of 1m below ground surface. The soil properties are C = 15 kN/m^2; ϕ = 28°, γ_t = 18 kN/m^3, γ' = 10kN/m^3. Determine the ultimate bearing capacity if water table is i) at great depth; ii) at the level of footing; iii) at ground surface. Take. N_c = 32.36, N_t = 18.58 and N_r = 15.7. Use Terzaghis theory. **(08 Marks)**

7 a. Explain: i) Immediate settlements; ii) Primary consolidation settlements and iii) Secondary consolidation settlements. **(06 Marks)**

b. Estimate the immediate settlement of a footing of size 2m × 3m resting at a depth of 1.5m in a sandy soil whose compression modulus is 10N/mm^2. Footing transmits a pressure of 200kN/m^2. Take μ = 0.3 and influence factor as 1.06. **(06 Marks)**

c. The following results were obtained from a plate load test conducted on dry sand stratum using a square plate of size 0.3m.

Load intensity (kN/m^2)	50	100	150	200	250
Settlement (mm)	1.2	2.4	4.8	9.6	32

Determine the settlement of a square footing of width 1.5m. under a load intensity of 120kN/m^2. **(08 Marks)**

8 a. Explain the factors influencing the selection of depth of a foundation. **(06 Marks)**

b. Write a note on selection of foundation based on soil stratification and load carried. **(08 Marks)**

c. Explain the classification of pile foundation. **(06 Marks)**

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10CV65

Sixth Semester B.E. Degree Examination, June/July 2014
Hydraulic Structures and Irrigation Design-Drawing

Time: 4 hrs. Max. Marks:100

Note: 1. ***Answer TWO full questions from PART-A and ONE full question from PART-B.***
2. ***Assume data suitably if not given and mention the same.***

PART – A

1 a. State and explain different types of storage zones with the help of neat sketch. **(07 Marks)**

b. The monthly discharge volumes in million m^3 for period of 24 months recorded at stream gauging site are: 3, 6, 16, 30, 18, 15, 10, 8, 6, 4, 3, 1, 2, 5, 17, 28, 20, 15, 12, 7, 5, 4, 3 and 2. Determine size of reservoir proposed at the gauging site if it is to maintain an assured supply of 8.33 million m^3 per month. The water year may be taken as June-May. **(08 Marks)**

2 a. Explain different types of forces acting on a gravity dam. **(07 Marks)**

b. Briefly explain elementary profile of a gravity dam. **(08 Marks)**

3 a. Explain briefly various causes of failure of earth dam. **(06 Marks)**

b. Draw a neat sketch of earthen dam showing phreatic line with horizontal filter at downstream. **(05 Marks)**

c. A flow net is to be plotted for a homogeneous earthen dam of height 22 m and free board 2.0 m. The results obtained are:

Number of potential drops = 10
Number of flow channels = 4

The dam has horizontal filter of 30 m at downstream end and coefficient of permeability of dam material is 5×10^{-4} cm/sec. Calculate the discharge per metre run of dam. **(04 Marks)**

PART – B

4 Design the surplus work of a tank forming part of a chain of tanks.

Combined catchment area	= 25.89 sq.km
Intercepted catchment area	= 20.71 sq.km
Maximum water level	= +12.75
Full tank level	= +12.00
Ground level at proposed site	= +11.00
Ground level below proposed weir upto a reach of 6 m (Fall)	= +10.00
Top width of tank bund	= 2 m
Tank bund level (TBL)	= +14.50
Side slopes of bund on either side	= 2:1
Design saturation gradient with 1 m clear cover	= 4:1
Level of hard strata	= +9.50
Ryve's coefficient for combined catchment	= 9
Ryve's coefficient for intercepted catchment	= 1.5

Provision may be made to make Kutcha regulating arrangements to store water upto MWL in times of necessity. **(25 Marks)**

Draw:

i) Half plan at foundation and half plan at ground level. **(20 Marks)**

ii) Draw half longitudinal section and half longitudinal elevation. **(15 Marks)**

iii) Cross section across surplus weir. **(10 Marks)**

5 Design a canal drop of 2 metres with following data:

Hydraulic particulars of canal above drop.

Full supply discharge	= 4 cumecs
Bed width	= 6 m
Bed level	= +10.00 m
Full supply depth	= 1.5 m
Full supply level (FSL)	= +11.50
Top width of bank	= 2 m
Top bank level (TBL)	= +12.50 m
Half supply depth	= 1 m

Hydraulic particulars of canal below drop.

Full supply discharge	= 4 cumecs
Bed width	= 6 m
Bed level	= +8.00 m
Full supply depth	= 1.5 m
Full supply level (FSL)	= +9.50 m
Top width of bank	= 2 m
Top bank level (TBL)	= +10.50 m
Ground level at site of work	= +10.50 m
Good soil available for foundation is at	= +8.50 m **(25 Marks)**

Draw:

i) Half plan at foundation and half plan at ground level. **(20 Marks)**

ii) Longitudinal section. **(15 Marks)**

iii) Cross section showing half elevation and half section. **(10 Marks)**

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10CV661

Sixth Semester B.E. Degree Examination, June / July 2014
Theory of Elasticity

Time: 3 hrs. Max. Marks:100

Note: 1. ***Answer FIVE full questions, selecting at least TWO questions from each part.***
2. ***Missing data may be suitably assumed.***

PART – A

1 a. Explain : i) Stress at a point ii) Strain at a point. **(10 Marks)**

b. Explain the assumptions made in theory of elasticity, and also its applications. **(10 Marks)**

2 a. Derive the differential equations of equilibrium in two dimensional cartension co-ordinates. **(10 Marks)**

b. What is an Airy's stress function? Explain its importance in the theory of elasticity. **(10 Marks)**

3 a. Define the following with sketches and suitable examples:
i) Plane stress problems.
ii) Plane strain problems. **(10 Marks)**

b. By means of a strain rosette, the following strains, were recorded during the test on a structural member.

$\in_{\phi} = 2\times10^{-3}$, $\in_{(\alpha-\phi)} = 1.35\times10^{-3}$, $\in_{(\alpha+\beta+\phi)} = 0.95\times10^{-3}$.

Determine : i) Magnitude of principal strains and
ii) Orientation of principal planes.

Given that: $\phi = 0^0$, $\alpha = \beta = 45^0$, $\mu = 0.33$, E = 210 GPa **(10 Marks)**

4 Obtain an expression for σ_x for a simply supported rectangular beam of length '2L', width = unity and depth = '2h' is subjected to uniformly distributed load of intensity 'q' units per run over its entire length as shown in Fig. Q4. **(20 Marks)**

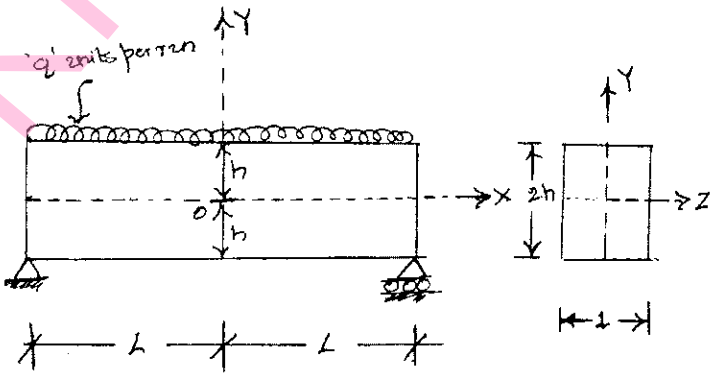

Fig. Q4

PART – B

5 a. Derive the compatibility equation in polar co-ordinate system. **(12 Marks)**

b. For the stress function, $\phi = \frac{P}{\pi} r\theta \sin\theta$. Determine the stress components σ_r, σ_θ and $\tau_{r\theta}$. **(08 Marks)**

6 Derive the expression for radial and tangential stress for the following condition of internal radius 'a' and external radius 'b':
i) when subjected to internal fluid pressure p_i only.
ii) when subjected to external fluid pressure p_0 only. **(20 Marks)**

7 Discuss the effect of circular hole on the stress distribution in a rectangular plate subjected to tensile stress in X-direction. Hence evaluate the stress concentration factor. **(20 Marks)**

8 a. Derive the differential equation, $\nabla^2\phi = -2G\theta$, for the torsion problem. **(12 Marks)**

b. A hollow aluminum tube of rectangular cross section shown in Fig. Q8 (b), is subjected to 56.50 kN-m along its longitudinal axis. Determine the shearing stresses and the angle of twist.
Assume shear modulus = 27.60 GPa. **(08 Marks)**

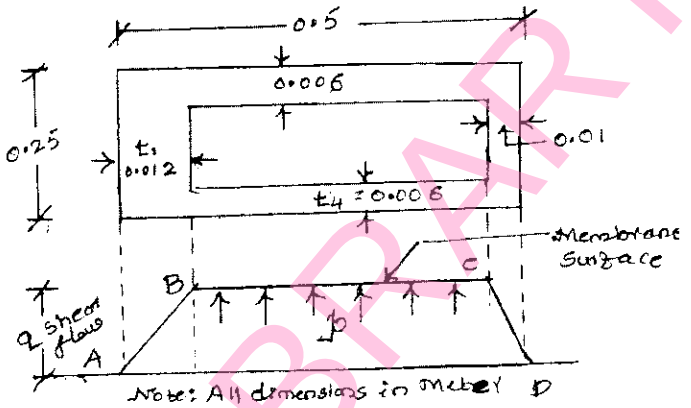

Fig. Q8 (b)

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10CV663

Sixth Semester B.E. Degree Examination, June/July 2014
Ground Improvement Techniques

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. Write a note on foundations suitable for construction on expansive soils and write the objectives of ground improvement. **(10 Marks)**

b. Explain factors to be considered in the selection of the best ground improvement technique. **(10 Marks)**

2 a. Briefly explain effect of compaction on engineering behavior of soils. **(10 Marks)**

b. Write short note on the following:
i) Dynamic compaction; ii) Applications of a vibro-float. **(10 Marks)**

3 Drainage (or) dewatering is the popular technique for consolidating saturated cohesive soils in-situ. Comment on the statement and discuss the difficulties in designing a drainage system. Show how a well-point system works with the help of a sketch. **(20 Marks)**

4 a. Write short notes on:
i) Sand drains with pre loading.
ii) Electro kinetic dewatering. **(10 Marks)**

b. Explain briefly about preloading without vertical drains for a building site. **(10 Marks)**

PART – B

5 a. What do you mean by soil stabilization? Explain the principle and mechanism of cement stabilization. **(10 Marks)**

b. Explain briefly about effect of cement stabilization on engineering behavior of soils. **(10 Marks)**

6 a. Write the requirements of soil stabilization. **(05 Marks)**

b. Explain the chemistry of lime stabilization. How the optimum lime content decided? Write the applications of lime stabilization. **(15 Marks)**

7 a. Explain briefly about various applications of grouting with sketches. **(10 Marks)**

b. What are the various types of grout injection methods? Explain any one with the aid of illustrative sketches. **(10 Marks)**

8 a. State the feasibilities and limitations of thermal stabilization techniques. **(08 Marks)**

b. Write short notes on the following:
i) Crib walls
ii) Soil nailing
iii) Stone column. **(12 Marks)**

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10CV665

Sixth Semester B.E. Degree Examination, June/July 2014
Ground Water Hydrology

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting atleast TWO questions from each part.***

PART – A

1 a. With a help of a neat sketch, explain unconfined aquifer, confined aquifer, flowing well, water table well and artesian well. **(06 Marks)**

b. State the advantages and disadvantages of groundwater over surface water. **(06 Marks)**

c. Explain the vertical distribution of subsurface water with a neat sketch. **(08 Marks)**

2 a. Explain the terms : specific retention, specific yield and storage coefficient. **(06 Marks)**

b. When 3.68 million m^3 of water was pumped out from on unconfined aquifer of 6.2 km^2 aerial extent, the water table was observed to go down by 2.6 m. What is the specific yield of the aquifer? During monsoon, if the water table of the same aquifer goes up by 10.8m, what is the volume of recharge? **(08 Marks)**

c. An artesian aquifer 20 m thick has a porosity of 20% and bulk modulus of compression is 10^5 kN/m^2. Estimate storage coefficient of aquifer. What fraction of this is due to expansibility of water? Take clasticity of water $K_w = 2.13 \times 10^6$ kN/m^2. **(06 Marks)**

3 a. State Darcy's law. Also explain the terms :
i) Permeability
ii) Transmissibility
iii) Apparent velocity
iv) Actual velocity. **(06 Marks)**

b. It was observed in a field test that 3 hours 20 minutes was required for a tracer to travel from one well to another 20 m apart and the difference in water elevations was 0.5 m. Sample of aquifer between the wells indicated porosity of 15%. Determine the permeability of aquifer, seepage velocity and Reynold's number for flow. Assume average grain size of 1 mm and kinematic viscosity γ for water as 0.008 stokes. **(08 Marks)**

c. Three wells A, B and C tap the same horizontal aquifer. The distances AB = 1200 m and BC = 1000 m. The well B is exactly south of well A and well C lies to the west of B. The following are the ground surface elevation and depth of water below the ground surface in the three wells.

Well	Surface elevation (m) above datum	Depth of water table (m)
A	200	11
B	197	7
C	202	14

Determine the direction of groundwater flow in the aquifer in the area ABC of the wells. **(06 Marks)**

4 a. Derive an equation for discharge for the case of steady, radial flow in an unconfined aquifer using Dupuit's theory. State the assumptions made. **(10 Marks)**

b. A well of diameter 0.5 m penetrates fully into a confined aquifer and is pumped at a constant rate of 2400 m^3/day. If the transmissivity of the aquifer is 1500 m^2/day and the initial height of the piezometric surface is 20 m, compute the radius of influence for a drawdown of 2 m measured at the well face. What would be the piezometric head at an observation well 45 m away from the main well axis? **(10 Marks)**

PART – B

5 a. Explain Theis method to determine aquifer constants S and T for unsteady radial flow towards well. **(10 Marks)**

b. A 30 cm well penetrating a confined aquifer is pumped at a rate of 1200 liters/minute. The drawdown at an observation well at a radial distance of 30 m is as follows :

Time from start (min)	1.0	2.5	5	10	20	50	100	200	500	1000
Drawdown (m)	0.2	0.5	0.8	1.2	1.8	2.5	3	3.7	4.4	5.0

Calculate the aquifer parameters S and T by Cooper-Jacob method. **(10 Marks)**

6 a. Describe various types of tube wells, with neat sketches. **(08 Marks)**

b. What do you understand by well shrouding? **(06 Marks)**

c. Explain the percussion method of drilling a tube well. **(06 Marks)**

7 a. Describe in detail, the exploration of groundwater by seismic refraction method. **(10 Marks)**

b. Briefly explain any two methods of logging. **(10 Marks)**

8 a. What is artful recharge of groundwater? Explain various methods of groundwater recharge. **(14 Marks)**

b. Explain groundwater budget. **(06 Marks)**

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10CV666

Sixth Semester B.E. Degree Examination, June/July 2014
Rural Water Supply and Sanitation

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. What are the various steps to be taken while planning and execution of rural water supply schemes? Explain briefly. **(10 Marks)**

b. List the various sources of water generally being practicing in rural area. Discuss. **(10 Marks)**

2 a. Enumerate different types of pumps generally being adopted in rural water supply schemes. Explain any one of them. **(10 Marks)**

b. What is deflouridation? Explain any one method of deflouridation adopted in rural water supply schemes in India. **(10 Marks)**

3 a. With a neat sketch explain the septic tank and a soak pit used for the disposal of human excreta in a rural situation. **(10 Marks)**

b. Explain the following:
i) Public latrines
ii) Trenching method of composting **(10 Marks)**

4 a. Distinguish between sullage and sewage. Discuss how sullage will be disposed in rural areas. **(10 Marks)**

b. What do you understand by the term "Rain water harvesting"? Discuss briefly with sketches how the rainwater is being harvested from roof top. **(10 Marks)**

PART – B

5 a. List the various types of pathogenic organisms commonly found in rural water supply system. Explain. **(10 Marks)**

b. What are the various methods of preventing the water borne diseases? Discuss. **(10 Marks)**

6 Explain the following:
a. Refuse collection and transportation methods
b. Cow-dung disposal
c. Biogas plant
d. Dumping in rural community wastes in low lands **(20 Marks)**

7 a. With a sketch explain how cow shed can be planned. Discuss. **(10 Marks)**

b. Write brief note on:
i) pasteurization
ii) cattle borne diseases **(10 Marks)**

8 Write short notes on any FOUR of the following:
a. Insect control methods
b. Disease transmittance due to housefly and mosquito
c. Removal of iron from drinking water
d. Ground water contamination
e. Drinking water quality standards **(20 Marks)**

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