

Seat No.	
----------	--

SL-261

Total No. of Pages : 3

B.E. (Civil) (Semester - VII) (Revised)

Examination, May - 2017

ADVANCED ENGINEERING GEOLOGY (Elective - I)

Sub. Code : 67566

Day and Date : Friday, 19 - 05 - 2017

Total Marks : 100

Time : 2.00 p.m. to 5.00 p.m.

- Instructions :**
- 1) All questions are compulsory.
 - 2) Answer to the two Sections must be written in one and same answer book.
 - 3) Neat diagrams must be drawn wherever necessary.
 - 4) Figures to the right hand side indicate full marks.

SECTION - I

- Q1) a)** Describe in detail the "Vindhyan System" with respect to the following points: [8]
- i) Distribution
 - ii) Lithology and Classification
 - iii) Economic Importance
- b) Comment in detail upon the statement "Surface and Subsurface explorations are complementary to each other". [7]

Q2) Write short notes on any four of the following: [20]

- a) Geological Time Scale.
- b) Artificial recharge of aquifers.
- c) Plate Tectonics.
- d) Cone of depression and its significance in Civil Engineering.
- e) Chemical parameters of ground water quality.

P.T.O.

SL-261

Q3) a) Write brief account of Intertrappean beds and Dykes in Deccan trap. [8]

OR

a) Comment in detail upon seismic activity at Koyana as an example of Reservoir Induced Seismicity. [8]

b) Following is the data obtained during drilling a borehole at Chainage 500.00m on the dam alignment. [7]

i) Top R.L. of bore - 445.00m

ii) Bore hole ends at R.L. - 400.00m

iii) Length of each piece of core recovered between R.L. 427.0m and 430.0m is as follows:

18, 15, 14, 20, 13, 08, 22, 09, 13, 35, 20, 16, 07, 08, 16, 21, 18.

All piece length are in cm.

Find out:

1) Total depth of bore

2) Total length of core recovered

3) Core recovery %

4) R.Q.D.

5) Core loss

As per conclusion comment on suitability or unsuitability of the site with justification.

SECTION - II

Q4) Describe in detail the four pin method of electrical resistivity in study of subsurface water and discuss the use in civil engineering projects. [16]

SL-261

- Q5) a) Discuss the favorable and unfavorable conditions when tunnel is driven through basalt. [9]
- b) Describe in detail the origin, occurrence and civil engineering aspects of Laterite. [9]

OR

- b) With the help of examples discuss in detail the Civil engineering problems due to occurrence of Volcanic braccia, Columnar basalt and Tachylitic basalt. [9]

Q6) Write a short note on any four of the following: [16]

- a) Origin and occurrence of Coal in India.
- b) Geothermal energy.
- c) Environmental implications of dam.
- d) Scarcity of sand in Deccan Trap area.
- e) Genesis of petroleum.

Seat No.	
----------	--

SL-259

Total No. of Pages : 2

B.E. (Civil Engineering) (Semester - VII) (New)
Examination, May - 2017

ADVANCED FOUNDATION ENGINEERING (Elective - I)

Sub. Code : 67564

Day and Date : Friday, 19 - 05 - 2017

Time : 2.00 p.m. to 5.00 p.m.

Total Marks : 100

- Instructions :
- 1) All questions are compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Use of non-programmable calculator and relevant I.S. Codes is allowed.
 - 4) Assume suitable data if required and mention it clearly.

SECTION - I

- Q1) a) Explain criteria to decide depth and location of shallow foundation in detail. [8]
- b) A trapezoidal footing is to be designed for two columns which are at a distance of 6.0 m(c/c). Loads acting on the columns are 2000 kN and 1500 kN. Sizes of both columns are 0.5 m × 0.5 m. Proportion the footing such that the edges of the columns are in-line with edges of footing. Take allowable bearing capacity of soil as 200 kN/m². [8]

OR

- b) Explain following terms: [8]
- i) Immediate settlement.
 - ii) Consolidation settlement.
- Q2) a) Explain types of raft foundation with figures. [9]
- b) A building consists of 12 columns. Each column is of size 400 × 400mm. These columns are arranged in three rows of four columns in each row. Distance between the columns is 5 m in both ways. Each column at the corner carries 500 kN load, each exterior column carries 700 kN load while each interior column carries 900 kN load. Calculate soil pressure below each column. Allowable soil pressure is 90 kN/m². [9]

P.T.O.

- Q3) a) Explain classification of pile in detail. [8]
- b) A square group of 9 piles was driven into soft clay extending upto large depth. The diameter and the length of the pile are 0.3 and 9m respectively. If the unconfined compressive strength of the clay is 90 kN/m^2 , and the pile spacing is 0.9m (c/c), what is the capacity of this pile group? Assume factor of safety of 2.5 and adhesion factor of 0.75. [8]

SECTION - II

- Q4) a) Resonance occurred at a frequency of 22 cycles per second in a vibration test of block $1\text{m} \times 1\text{m} \times 1\text{m}$. Determine the coefficient to elastic uniform compression of soil. The mass of the oscillator is 65 kg and the force produced by it at 12 cycles/second is 981 N. Also compute the amplitude in vertical direction at 12 cycles/second. [8]
- b) Define following terms w.r.t. machine foundations: [8]
- i) Degree of freedom.
 - ii) Free vibration and forced vibration.
 - iii) Frequency.
 - iv) Resonance.

OR

- b) List provisions of IS code for the design of foundations for reciprocating machines. [8]
- Q5) a) Explain free earth support and fixed earth support method. [9]
- b) Explain types and uses of cofferdam and its applicability. [9]
- Q6) a) Explain the problems associated with ground water while installing foundation. Also explain ground water lowering. [8]
- b) Write short notes on: (Any two) [8]
- i) Cement stabilization.
 - ii) Lime stabilization.
 - iii) Shoring and underpinning.

SL-254

Total No. of Pages : 2

Seat No.	
----------	--

B.E. (Civil Engineering) (Semester-VII) (New) (Revised)
Examination, May - 2017
DESIGN OF CONCRETE STRUCTURES-I
Sub. Code : 67558

Day and Date : Monday, 15-05-2017
Time : 2.00 p.m. to 5.00 p.m.

Total Marks : 100

- Instructions :
- 1) All Questions are Compulsory.
 - 2) Figures to the right indicate full marks.
 - 3) Assume any suitable data wherever necessary.
 - 4) Use of non-programmable calculator and relevant I.S. 456:2000 are allowed.

SECTION-I

- Q1) a) Compare Working Stress Method and Limit State Method of RC design. [6]
- b) Find $X_{u, max}$, $P_{t, lim}$, and $M_{u, lim}$ for Fe 415 steel and M20 concrete. [6]
- c) Explain the following [4]
- i) Characteristic Strength
 - ii) Partial Safety Factors
- Q2) a) State the assumptions made in design of limit state of collapse in flexure. [4]
- b) Determine the moment of resistance of the rectangular RC beam of size 250mm wide and 450mm deep to the centre of tensile reinforcement. It is reinforced with 2 bars of 16mm diameter as compression reinforcement at an effective cover of 50mm and 4 bars of 25mm diameter as tensile steel. use M15 concrete and Fe 250 steel. [13]

OR

- a) Explain the necessity of doubly reinforced sections. [4]
- b) Find the moment of resistance of a T-beam section having following data. [13]
- | | |
|---|-----------------------------------|
| Width of flange: 800mm | Thickness of slab: 120mm |
| Width of rib: 200mm | Effective depth: 400mm |
| Tensile steel area: 3500mm ² | Use M15 concrete and Fe 250 steel |

P.T.O.

- Q3) a)** Explain in brief the IS recommendations to control cracks. [4]
- b) A simply supported reinforced concrete beam is 250mm wide 500mm deep to the centre of tensile reinforcement and is reinforced with 4 bars of 20mm diameter as tensile steel. If the beam is subjected to a factored shear of 95kN at the support. Design the shear reinforcement consisting of stirrups. Use M15 concrete and Fe 415 steel. [13]
- Show reinforcement details.

SECTION-II

- Q4)** Design a simply supported one way slab provided over a clear span of 3.30m. It carries a live load of 4kN/m² and floor finish of 1kN/m². Width of supporting wall is 230mm. Use M20 concrete and Fe 415 steel. Assume moderate environment. [17]

OR

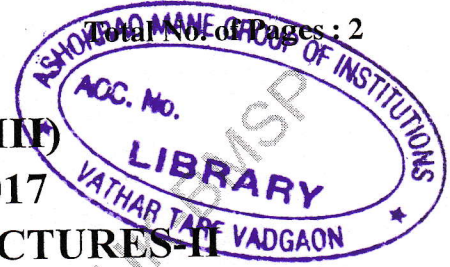
Design a dog-legged staircase for a building in which the vertical distance between the floor is 3.6m. The stair hall measures 3.5m × 5m. The live load may be taken as 3000N/m². Use M20 concrete and Fe 415 steel. Show reinforcement details. [17]

- Q5) a)** Write a note on $P_u - M_u$ interactions diagrams. [6]
- b) Design a short axially loaded column, 500mm × 500mm for a service load of 2000kN. Use M20 concrete and Fe 415 steel [10]
- Q6)** Design a rectangular isolated footing of constant depth for RC column of size 400mm × 600mm bearing a vertical load of 800kN. The safe bearing capacity of soil may be taken as 120kN/m². Use M20 concrete and Fe 415 steel. [17]

→ → →

SL-278

Seat No.	
----------	--



B.E. (Civil) (Semester-VIII)
Examination, April - 2017
DESIGN OF CONCRETE STRUCTURES-II
Sub. Code : 67748

Day and Date : Tuesday, 25-04-2017
Time : 2.00 p.m. to 5.00 p.m.

Total Marks : 100

- Instructions :**
- 1) Attempt any three questions from each section.
 - 2) Figures to right indicates full marks.
 - 3) Assume suitable data wherever necessary and mention it clearly.
 - 4) Use of non programmable calculator is allowed.
 - 5) Use of relevant IS Codes are allowed.

SECTION-I

- Q1)** Design the beam for following data, **[16]**
- a) Bending Moment = 42 KN.m
 - b) Shear force = 30 KN
 - c) Twisting moment = 12 KN.m
 - d) Assume width of beam 300mm, Design the beam for torsion effect.
 - e) Use M20 and Fe 415 Grades of materials.
- Q2)** A three span continuous beam ABCD is simply supported at A and D and continuous over support C and B. The beam carries a load of 230mm thick 3m high brick wall and superimposed load of 15KN/m. Design the beam using IS code coefficient. Span AB=BC=CD=6m. Unit weight of brick wall 20KN/m³. Use M20 and Fe 415. Sketch the reinforcement details. **[16]**
- Q3)** Design a open circular RCC water tank resting on ground. The capacity of tank is 550000 lit. of water. The joint between wall and base of tank is rigid. Depth of water tank is 4.5m. Use M20 and Fe 415. Adopt IS code method of design. Show the reinforcement details. **[18]**
- Q4)**
- a) Assuming suitable data, derive an expression for moment of resistance of singly reinforced balanced section as per working stress method. **[8]**
 - b) Explain the design procedure of circular water tank resting on ground with rigid base by I.S. code method. **[8]**

P.T.O.

SECTION-II

Q5) Discuss the terms,

- a) i) Tendon
- ii) Strands
- iii) Pre-tensioning
- iv) Post-tensioning

[8]

b) Explain different stages of loading in pre-stress concrete design. [8]

Q6) A pre-tensioned beam has a pre-stressing force of 1500KN in the tendon immediately after pre-stressing which eventually reduces to 1250KN. The beam carries two live loads of 40KN each in addition to its own weight. The two point loads of 40KN at distance of 5m from both ends and total span of beam 15m. Compute the extreme fiber stresses at mid span. [16]

- a) Under initial condition,
- b) At final condition.

Q7) A post tensioned beam 150mm×300mm is having parabolic cable consisting of 12 wires of 5mm diameter. The cable having eccentricity of 50mm at mid span and eccentricity zero at ends. The initial stress is 1000N/mm². Find the total percentage of loss of pre-stress. The span is 10m. take $\mu=0.35$, $k=0.0015$, relaxation of steel=3%, $E_c=3.5 \times 10^4$, $E_s=2.1 \times 10^5$, creep coefficient=2.5, shrinkage strain= 2×10^{-4} . [18]

Q8) A post tensioned pre-stressed beam of rectangular section 250mm wide is to be designed for an imposed load of 15KN/m uniformly distributed on span of 15m. Stress in the concrete must not exceed 17N/mm² in compression and 1.4N/mm² in tension. The loss of Pre-stress may be assumed 15%. Calculate.

- a) The minimum possible depth of beam
- b) For section producing minimum pre-stressing force and corresponding eccentricity. [16]

→ → →

SL-255

Total No. of Pages : 3

Seat No.	
----------	--

B.E. (Civil Engineering) (Semester - VII) (Revised)

Examination, May - 2017

EARTHQUAKE ENGINEERING

Sub. Code : 67559

Day and Date : Tuesday, 16 - 05 - 2017

Total Marks : 100

Time : 2.00 p.m. to 5.00 p.m.

- Instructions :**
- 1) Figure to the right indicates full marks.
 - 2) Assume any suitable data whenever necessary.
 - 3) Use of non-programmable calculator and I.S. 1893: 2002 (Part - I) are allowed.

SECTION - I

Q1) a) Write short note on: [8]

- i) Types of waves
- ii) Earth interior

b) Explain in details methods of determine magnitude of earthquake. [8]

Q2) a) Derive an equation for single degree undamped vibration system. [8]

**b) A SDOF vibrating system is having following parameters. $m = 10\text{kg}$,
 $k = 80 \text{ N/m}$, $C = 10 \text{ Ns/m}$. [10]**

Determine:

- i) Damping Factor
- ii) Natural Frequency
- iii) Damped frequency
- iv) Logarithmic decrement
- v) No. of cycles after which the original amplitude reduces to 25%.

OR

P.T.O.

SL-255

- b) A water tank is idealized as a single degree of freedom having equivalent weight of 10000 kN, damping ratio as 4% and stiffness factor as 20000 kN/m. [10]

Calculate:

- i) the natural time period
- ii) the damped time period
- iii) the damping constant and
- iv) the maximum horizontal displacement at the top of the water tank if it is loaded by a seismic force equivalent to $20 \sin(5t)$ kN.

- Q3) Calculate lateral forces in the critical direction at each floor level for a building of government office having building frame (OMRF) with following data by collector office seismic coefficient method. Also draw lateral load distribution diagram. [16]

- a) No. of storeys: 4
- b) No. of bay of X & Y direction: 6
- c) Storey height: 3.5 m
- d) Width of each bay in X & Y direction: 4m
- e) Size of beam: $0.3\text{m} \times 0.45\text{m}$
- f) Size of column: $0.45\text{m} \times 0.45\text{m}$
- g) Slab thickness: 150mm
- h) Wall thickness: 0.230 meter (exterior)
- i) Live Load: 4 kN/m^2
- j) Location:- Pune (Medium Soil)

SECTION - II

- Q4) a) Explain concept of ductile detailing & explain ductile detailing of beam as per IS 13920-1993 [10]
- b) Philosophy of Earthquake Resistant Design. Give four virtue of good earthquake resistant design. [8]

OR

SL-255

- b) What is soft storey problem? Explain how soft storey problems can be eliminated in the existing buildings. [8]
- Q5)** a) Discuss in detail the advantage of horizontal bands and vertical reinforcement in the masonry buildings. [8]
- b) Discuss the behavior of the following masonry walls in seismic regions: [8]
- i) Unreinforced masonry wall
 - ii) Infill masonry wall
- Q6)** a) Explain the term active and passive control system? [8]
- b) Explain in brief: [8]
- i) Viscous Fluid Dampers
 - ii) Viscoelastic Dampers



SUK-BMSP

SUK-BMSP

SUK-BMSP

SUK-BMSP

Seat No.	
----------	--

SL-257

Total No. of Pages : 2

B.E. (Civil) (Semester-VII) (Revised)
Examination, May - 2017
PROJECT MANAGEMENT AND CONSTRUCTION
EQUIPMENT
Sub. Code : 67561

Day and Date : Thursday, 18-05-2017
 Time : 2.00 p.m. to 5.00 p.m.

Total Marks : 100

- Instructions :
- 1) Attempt any THREE questions from each section.
 - 2) Figures to the right indicate full marks.

SECTION-I

- Q1) a) Explain 'Network Compression' step-by-step. [8]
 b) A network consists of the following activities and their durations of a small project. Draw the network, mark critical path and calculate T.F. and F.F. [9]

Activity	1-2	2-3	2-4	3-6	3-7	4-5	4-6	5-7	6-7
Duration in weeks	2	4	5	6	5	4	1	3	2

- Q2) a) What is the 'Concept of Probability' in P.E.R.T.? Explain the three time-estimates used in P.E.R.T. [8]
 b) How P.E.R.T. is different than C.P.M.?

Following data pertains to a project. Draw the PERT network and calculate the value of standard deviation for the critical path. [9]

Activity	Optimistic time	Most likely time	Pessimistic time
1-2	6	9	18
1-3	5	8	17
2-4	4	7	22
2-5	4	7	10
3-4	4	7	16
3-5	2	5	8
4-5	4	10	22

P.T.O.

- Q3) a) Enlist the causes of accidents in construction industry. [8]
 b) Define 'Risk Management'. Explain the steps of 'Risk Mitigation'. [9]

Q4) Write notes on any FOUR. [16]

- a) Objectives of Project Management
 b) Floats
 c) W.B.S.
 d) Safety Training
 e) Risk Identification Process

SECTION-II

- Q5) a) Explain the factors governing the selection of construction equipment. [8]
 b) Explain the working of a Hoe with a neat sketch. [9]

- Q6) a) Explain the necessity of compactors in construction projects. Enlist various compacting equipment and explain any ONE in detail with sketch. [8]

- b) Explain construction and working of Tower Crane with detailed sketch. [9]

- Q7) a) Explain the working of a Jackhammer with neat cross-section. [8]

- b) Explain (i) Drilling pattern, (ii) Explosives (iii) Detonators in rock excavation. [9]

Q8) Write notes on any FOUR. [16]

- a) Use of Bulldozers in construction project
 b) Clamshell
 c) Rippers
 d) Well point system of dewatering
 e) Use of compressed air in construction

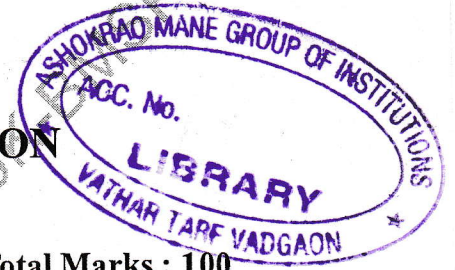


SL-256

Total No. of Pages : 3

Seat No. **ABSENT**

B.E. (Civil) (Semester-VII) (New)
Examination, May - 2017
QUANTITY SURVEYING & VALUATION
Sub. Code : 67560



Day and Date : Wednesday, 17-05-2017
Time : 2.00 p.m. to 5.00 p.m.

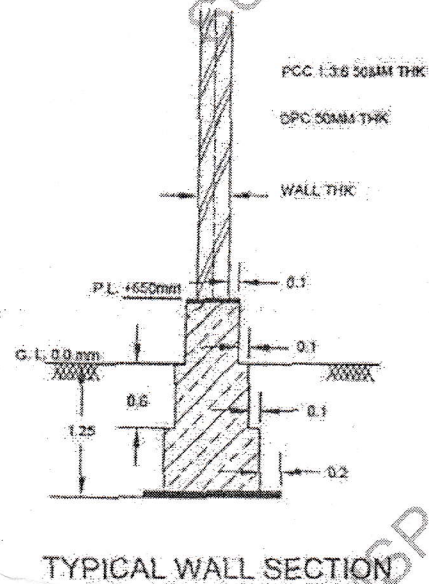
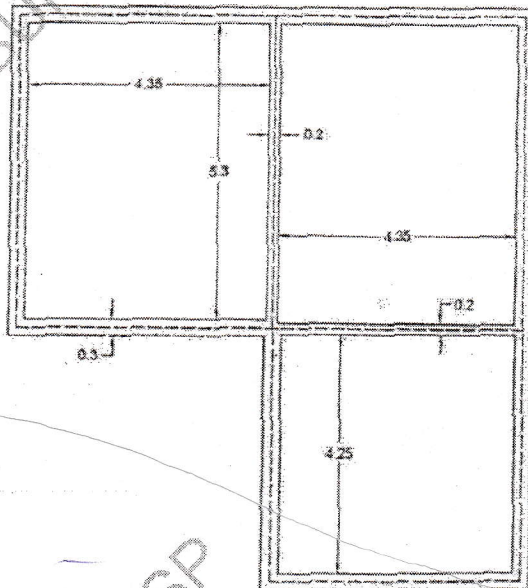
Total Marks : 100

- Instructions :
- 1) Q.No.1 is compulsory.
 - 2) Attempt any two questions from remaining questions of section-I.
 - 3) Attempt any three questions from Section-II.
 - 4) Assume any other additional data if required and state it clearly.

SECTION-I

Q1) Work out the quantities of the following items on a neat measurement sheet. [20]

- a) Earthwork in excavation in foundation
- b) PCC for the bed concrete
- c) UCR masonry in foundation and plinth



P.T.O.

SL-256

- Q2) a)** What is the importance of specification? Write brief sample specifications of plastering, brick masonry, and excavation. [10]
- b)** Enlist the task work of mason for the following works: [5]
- i) Plain cement concrete in plinth and foundation.
 - ii) Brick work in foundation.
 - iii) RCC in superstructure.
 - iv) Un coursed rubble masonry.
 - v) 12 mm thick cement plaster.
- Q3) a)** Write short note on overhead charges, transportation charges and price escalation. [7]
- b)** What are the different types of approximate estimates? Explain the method of estimate for an industrial shed having several long bays. [8]
- Q4) a)** What are the various purposes for which estimates are prepared and used in a government organization? [5]
- b)** Differentiate between supplementary estimate and revised estimate? [5]
- c)** Prepare a rate analysis for RCC footing of size $1.15 \times 0.9 \times 0.35$, two in numbers and M15 concrete. [5]

SECTION-II

- Q5) a)** Write detailed note on unbalanced bidding. [5]
- b)** Why preparation of contract documents is essential. [7]
- c)** Draft a tender notice for a municipal corporation road project of 20 km in and around the city worth Rs. 20 crores. Assume any other suitable data. [5]

SL-256

- Q6) a) Why valuation needed? Write the significance of land value in reversion. [5]
- b) An RCC framed G+2 building is constructed on a plot having details: [12]
- Plot of land 500 Sqm, present rate is 3000/- per sqm.
 - Net yield = 9%.
 - B.U.A. is 350 sqm/floor @ construction rate of Rs. 6500 per sqm.
 - Life of building is 50 years.
 - Repair & maintenance @ 1/12 of gross rent.
 - Municipal tax @ 15%
 - Management and miscellaneous charges @ 8% of gross rent
 - Insurance premium @ 1%
 - Gross rent Rs. 5 lac p.a.
 - Compounded interest on sinking fund @ 9%
 - Property taxes @ 5% of gross rent

Work out the fair value of property.

- Q7) a) A tower crane was purchased for Rs. 10 lacs. Assume salvage value of crane as Rs. 1 lac after 12 years. Find its book value at the end of 9 years by constant percentage method. [7]
- b) Write a short note on different types of value. [5]
- c) Which are the types of lease discuss in detail. [5]

Q8) Write short note on (any three). [16]

- B.O.T. and B.O.O.T.
- Outgoing in a society
- Annuity and its types
- Profit base valuation method

→ → →

SL - 997

Total No. of Pages : 2

Seat No.	
-------------	--

**B.E. (Civil) (Part - II) (Semester - VIII) Examination,
April - 2017**

TRANSPORTATION ENGINEERING

Sub. Code : 67750

Day and Date : Saturday, 29 - 04 - 2017

Total Marks : 100

Time : 02.00 p.m. to 05.00 p.m.

- Instructions :
- 1) Attempt Any THREE questions from section I & section II EACH.
 - 2) Make suitable assumptions WHEREVER necessary & state them clearly.
 - 3) Figures to the RIGHT indicate FULL marks.

SECTION - I

- Q1)** a) State aims & objectives of Town Planning. [8]
b) State the factors to be considered for selection of site for an Ideal Town. [8]
- Q2)** a) Enlist the Functions of State Housing Board. [8]
b) State meaning of Slum & causes of Slums. [8]
- Q3)** a) Explain Necessity of Land Acquisition Act. [8]
b) Explain Necessity of Recreational Facilities & Types of Recreation Systems. [8]
- Q4)** Write a Short Note On (ANY THREE) [18]
a) Housing Problems in India
b) Aesthetics of Town Planning
c) Cul-de-Sac
d) Development Plan

P.T.O.

SECTION - II

- Q5) a) What is Permanent way. State the requirements of a Good Track. [8]
b) Draw a Neat sketch of B.G. Single Line Track in Cutting Indicating all Components. [8]
- Q6) a) What are the functions of Points & crossings with neat Sketch. [8]
b) Explain different types of Station Yards. [8]
- Q7) a) Enlist the different type of Loadings used for designing a Bridge. [8]
b) Enumerate the various bridges with movable-span-structures necessary. [8]
- Q8) Write a Short Note On (ANY THREE) [18]
a) Culvert
b) Bridge Bearing-Objectivs & Types.
c) Turnout -sketch Right-hand turnout
d) Maintenance of Bridges



Seat No.	
----------	--



SJ-294

Total No. of Pages : 2

B.E. (Civil) (Semester-VII) (New) (Revised)
Examination, November - 2016
ADVANCED ENGINEERING GEOLOGY (Elective-I)
Sub. Code : 67566

Day and Date : Friday, 25 - 11 - 2016

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :**
- 1) All questions are compulsory.
 - 2) Answer to the two Sections must be written in one and same answer book.
 - 3) Neat diagrams must be drawn wherever necessary.
 - 4) Figures to the right hand side indicate full marks.

SECTION-I

- Q1) a)** Describe in detail the "Deccan Trap" with respect to the following points [8]
- i) General details and Distribution
 - ii) Lithology
- b) Comment in detail upon the statement " Surface and Subsurface explorations are complementary to each other". [7]

Q2) Write short notes on any four of the following: [20]

- a) Climatic conditions and economic importance of Gondwana system
- b) Core recovery
- c) Plate Tectonics
- d) Types of aquifers
- e) Principles of stratigraphy

Q3) a) Discuss the tectonic cause of Deccan trap seismicity. [8]

OR

- a) Write brief account of Hydrogeological properties of water bearing rocks. [8]

P.T.O.

- b) Following is the data obtained during drilling a borehole at Chainage 200.00m on the dam alignment.
- i) Top R.L. of bore - 530.00m
 - ii) Bottom R.L. of bore - 480.00m
 - iii) Length of each piece of core recovered between R.L. 527.0m and 524.0m is as follows 08, 15, 10, 06, 04, 03, 12, 14, 16, 12, 10, 11, 15, 06, 02, 04, 12, 16, 12, 13, 02, 10, 07, 13, 11. All piece length are in cm.

Find out

[7]

- 1) Total depth of bore
- 2) Total length of core recovered
- 3) Core recovery
- 4) R.Q.D.
- 5) Machine run

As per conclusion comment on suitability or non suitability of the site with justification.

SECTION-II

- Q4)** Explain in detail the electrical resistivity method in the study of groundwater and civil engineering problems. [17]

- Q5) a)** With the help of examples discuss in detail the Civil engineering problems due to the occurrence of dykes and fractures, red bole and Columnar basalt. [9]
- b) Describe in detail the suitability of basalts from tunneling point of view. [8]

OR

- b) Describe in detail the suitability of Compact basalt and Amygdaloidal basalt as a construction material. [8]

- Q6)** Write a short note on any Four of the following: [16]

- a) Renewable and non renewable resources.
- b) Occurrence and reserves of coal in India.
- c) Environmental implications of canal construction
- d) Geothermal energy
- e) Tail channel erosional problems in Deccan Trap region
- f) Origin of Laterite

✓ ✓ ✓

Seat No.	
----------	--

SJ-292

Total No. of Pages : 3

B.E.(Civil) (Semester-VII) (New)

Examination, November - 2016

ADVANCED FOUNDATION ENGINEERING (Elective-I)

Sub. Code : 67564

Day and Date : Friday, 25 - 11 - 2016

Total Marks : 100

Time : 2.30 p.m. to 5.30 p.m.

- Instructions :
- 1) All question are compulsory.
 - 2) Figures to the right indicates full marks.
 - 3) Use of non-programmable calculate and relevant I.S. Codes is allowed.
 - 4) Assume suitable data if required and mention it clearly.

SECTION-I

- Q1) a) Explain the suitability of various types of shallow foundation with sketches. [8]
- b) A trapezoidal footing is to be provided to support two columns 300×300 mm and 500×500 mm size respectively with 6.0 m apart. The safe bearing capacity of soil is 400 kN/m^2 . Bigger column carries 5000kN and the smaller 3000 kN load. Design a suitable size footing so that it does not extend beyond the face column. [8]

OR

- b) Compute consolidation settlement for a square foundation of 1.5 m by 1.5 m with following data: [8]
- i) Load on the foundation = 225 kN
 - ii) foundation depth = 1.0 m
 - iii) Soil density = 18 kN/m^3
 - iv) Coefficient of compressibility, $C_c = 0.38$
 - v) Initial void ratio, $e_0 = 0.90$
 - vi) Depth of clay layer below founding level = 3 m

Divide clay layer into three equal strips for computations. Assume 2:1 stress distribution.



P.T.O.

- Q2) a) Discuss various types of raft foundation with practical applications. [8]
 b) Plan of mat foundation with corresponding columns loads is shown in Figure 1. Calculate the soil pressure bellow all columns. All columns are of size $0.6 \text{ m} \times 0.6 \text{ m}$. [8]

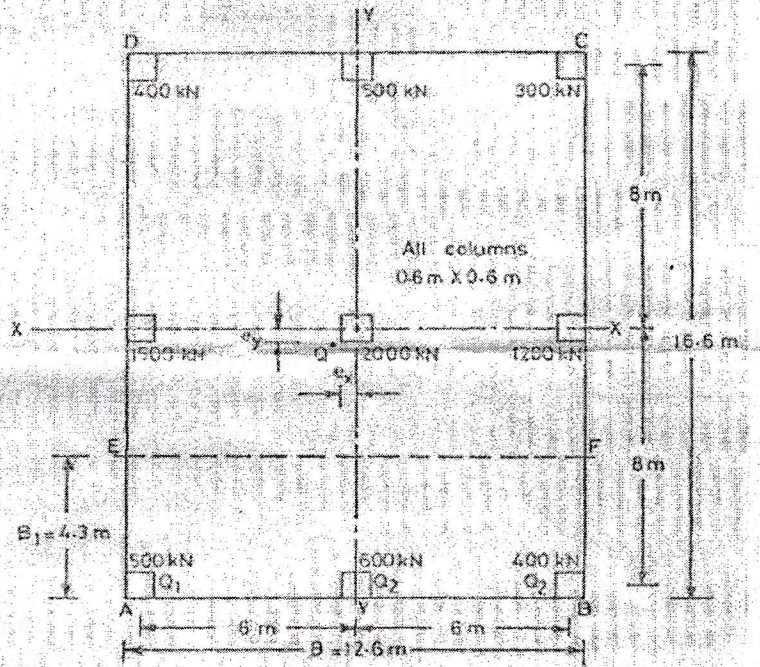


Figure 1

- Q3) a) Explain dynamic formulae for calculation of load carrying capacity of piles. [9]

OR

- a) Explain group action of piles. Also explain methods of calculate group efficiency of piles. [9]
 b) A square group of 9 piles was driven into soft clay extending to a large depth. The diameter and length of pile were 300 mm & 10 m respectively. If the unconfined compression strength of the clay in 100 kN/m^2 and the pile spacing is 750 mm c/c. what is the capacity of the group? Assume a factor of safety of 3 and adhesion factor of 0.60. Density of soil 20 kN/m^3 . [9]

SECTION-II

- Q4) a) Write in brief the design criteria for reciprocating machines. [8]
b) Resonance occurred at 30 cycles/ second in a vertical vibration block test. The size of the block was $1.0 \text{ m} \times 1.0 \text{ m} \times 1.0 \text{ m}$. The weight of the oscillator was 800 N and force produced by it after 15 cycles is 1500 N. Calculate:
i) Value of C_u
ii) Maximum amplitude in vertical direction after at 15 cycles/sec.
Take unit weight of material for test block as 24 kN/m^3 . [8]
- Q5) a) Explain different types of sheet pile walls. Explain with the help of pressure distribution. [9]
b) Explain types and uses of cofferdams with sketches. [9]
- OR
- b) Explain design of sheet pile wall in granular and cohesive soil. [9]
- Q6) a) What are the problems associated with foundation installation? [8]
b) Write short notes on: (Any Two) [8]
i) Mechanical stabilization
ii) Cement stabilization
iii) Damage and vibrations due to constructional operations

✓ ✓ ✓