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10CV71

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019
Environmental Engineering – II

Time: 3 hrs.

Max. Marks:100

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

PART – A

1   a. Explain the different types of sewerage systems with their merits, demerits and suitability. (08 Marks)
    b. Explain the factors affecting dry weather flow. (04 Marks)
    c. A city having catchment area of 6000 hectares and population density of 150 persons per hectare is supplied with water at the rate of 200 litres per capita per day. The intensity of rainfall is 40 mm/hr and average runoff coefficient is 0.50. If 75% of water supplied contributes to the sewage. Determine the ratio of sanitary sewage (D.W.F) and storm water (W.W.F). (08 Marks)

2   a. Briefly explain the self cleaning velocity and non-scouring velocity giving their desired values. (06 Marks)
    b. Explain the desirable characteristics of a sewer material. List the sewer materials commonly used. (06 Marks)
    c. Calculate the velocity, discharge and chezys coefficient for a stonework sewer running full. The diameter of sewer is 150 mm and it is laid at a gradient of 1 in 60. Assume N = 0.013 in mannings formula. (08 Marks)

3   a. Explain with a neat sketch, working of a deep manhole. (10 Marks)
    b. Explain the following with sketches:
       i) Catch basins
       ii) Oil and grease traps. (10 Marks)

4   a. Explain different types of sampling. (06 Marks)
    b. Write a note on carbon cycle. (06 Marks)
    c. The BOD of a sewage incubated for one day at 30°C has been found to be 110 mg/lit. What will be the 5-day 20°C BOD? Assume $K_1 = 0.1$ at 20°C. (08 Marks)

PART – B

5   a. Explain:
       i) Self purification of streams
       ii) Zones of purification. (06 Marks)
    b. Explain:
       i) Sewage farming
       ii) Sewage sickness. (06 Marks)
    c. Using the following data, find out DO at the end of 2 days.

	River	Wastewater
Flow in m³/s	19	1
DO in mg/lit	9	0
BOD in mg/lit	3	200

   Assume R = 0.12 per day,   r = 0.42 per day. (08 Marks)

6 a. Explain with a flow diagram a conventional sewage treatment plant. Discuss the function of each component. **(10 Marks)**

b. A grit chamber is designed to remove particles with a diameter of 0.2 mm, specific gravity 2.65. Settling velocity for these particles has been found to range of 0.016 to 0.022 m/sec, depending on their shape factor. A flow through velocity of 0.3 m/sec will be maintained by proportioning weir. Determine the channel dimensions for a maximum waste water flow of 10000 cum/day. **(10 Marks)**

7 a. With the help of a neat sketch, explain the working of trickling filter. **(10 Marks)**

b. Mention the modification of activated sludge process. Explain any two of them. **(10 Marks)**

8 Write short notes on:
a. Oxidation pond
b. Reuse and recycle of wastewater
c. Sludge digestion tank
d. Low cost waste treatment **(20 Marks)**

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Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019

Design of Steel Structures

Time: 3 hrs.   Max. Marks:100

Note: 1. *Answer any FIVE full questions, selecting*
at least TWO questions from each part.
2. *Use of IS-800-2007 and steel tables permitted.*

PART – A

1 a. Describe briefly advantages and disadvantages of steel structures. **(06 Marks)**
b. Explain the load combinations adopted in the design of steel structures. **(06 Marks)**
c. Explain the four classes of section as per IS-800-2007. **(08 Marks)**

2 a. Explain the various modes of failure of bolted connections with neat sketches. **(06 Marks)**
b. Determine the strength and efficiency of lap joint consists of 10 mm and 8 mm thick plates. Use M18 grade 5.6 black bolts and Fe440 grade plate.

Fig.Q2(b) **(14 Marks)**

3 a. Describe briefly advantages and disadvantages of welded connections. **(06 Marks)**
b. Determine the bracket load "P" the column can carry. Take size of weld as 8 mm.

Fig.Q3(b) **(14 Marks)**

4 a. Determine the shape factor of a 'T' section having a flange width 200 mm and 20 mm thick with a web of 10 mm thick and 180 mm depth. **(06 Marks)**
b. Calculate "plastic moment" for the beam as shown in Fig.Q4(b). Use load factor = 2.

Fig.Q4(b) **(14 Marks)**

PART – B

5   Design a tie or tension member using double angle (equall legs) section connected on either side of gusset plate subjected to a force of 300 kN use suitable welded connection. If the length of member is 3m. Check for reversal of stresses. **(20 Marks)**

6   Design a compression member using double channel section "face to face" to carry a factored load of 1600 kN. The length of the column is 5m with one end is fixed and other end is hinged. Also design single lacing system. **(20 Marks)**

7   Design a column base (slab base) and concrete base for a column ISHB400 subjected to an axial load of 1000 kN. Use M20 grade concrete and safe bearing capacity of soil is 200 kN/m^2. Draw neat sketch. Use welded connection. **(20 Marks)**

8   The RCC floor of a classroom 6m × 12m is supported on beam kept at 3m c/c. The beams are simply supported at ends over a span of 6m and rest on 300 mm thick masonry wall. Assuming the thickness of slab is 125 mm, live load on slab is 4 kN/m^2. Design an interior beam using IS specifications. Apply all the necessary checks. **(20 Marks)**

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Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019
Estimation and Valuation

Time: 3 hrs.   Max. Marks:100

Note: 1. *Part – A Q.No. 1 which is compulsory, Answer any FOUR questions by Selecting any TWO from part B and TWO from part C each.*
2. *Missing data, if any, may be suitably assumed.*

PART – A

1   Prepare a detailed estimate residential building in Fig.Q1(Refer page no.2) for the following items of work. Prepare on abstract of estimated cost.
  a. Earth work excavation for foundation in hand soil at Rs. 125/m^3
  b. CC 1 : 4 : 8 for foundation at rate Rs. 2800/m^3
  c. Size stone masonry for foundation in cm 1 : 8 and basement in cm 1 : 6 at rate
  d. BBM for superstructure in cm 1 : 6 at the rate of Rs
  e. Internal plastering in cm 1 : 6 for walls at rate of Rs.   **(40 Marks)**

PART – B

2   Prepare a detailed estimate of a manhole from the given drawing Fig.Q2(Refer page no.3), work out the quantities and cost of the following terms of work.
  a. Earth work excavation for foundation at the rate of Rs.200/m^3
  b. CC 1 : 4 : 8 for foundation at rate Rs
  c. First class brick work in cm 1 : 4 at rate of Rs.   **(15 Marks)**

3   Write detailed specification of any three of following :
  a. Size stone masonry for foundation in cm 1 : 8
  b. BBM for super structure in cm 1 : 6
  c. 12mm ceiling plastering
  d. Cement concrete 1 : 2 : 4 for plinth.   **(15 Marks)**

4   a. Enumerate various types of estimate. Explain any two in brief.   **(10 Marks)**
     b. "Estimate is never the actual cost but it is approximate cost" Explain briefly. **(05 Marks)**

PART – C

5   Workout form first principle, the rate analysis for any three of the following :
  a. Cement concrete 1 : 4 : 8 for foundation
  b. BBM for super structure in cm 1 : 6
  c. Size stone random rubble masonry for foundation in cm 1 : 8
  c. CC 1 : 1$\frac{1}{2}$: 3 for beams with 2% steel.   **(15 Marks)**

6   Prepare the cost of earth work for a portion of road for 400 meter length from the following data :
a.   Formation width of road is 10mt
b.   Side slopes are 2 : 1 in banking and $1\frac{1}{2}$: 1m cutting
c.   The cost of filling is Rs. 250/m^3 and cutting is Rs. 160/m^3.   **(15 Marks)**

Station	Distance in mt	RL of ground	RL of formation
20	1000	51.00	52.00
21	1040	50.90	
22	1080	50.50	
23	1120	50.80	
24	1160	50.60	Downward gradient
25	1200	50.70	of
26	1240	51.20	1 in 200
27	1280	51.40	
28	1320	51.30	
29	1360	51.00	
30	1400	50.60	

7   Explain any three of the following :
a.   EMD
b.   Security deposited
c.   NMR
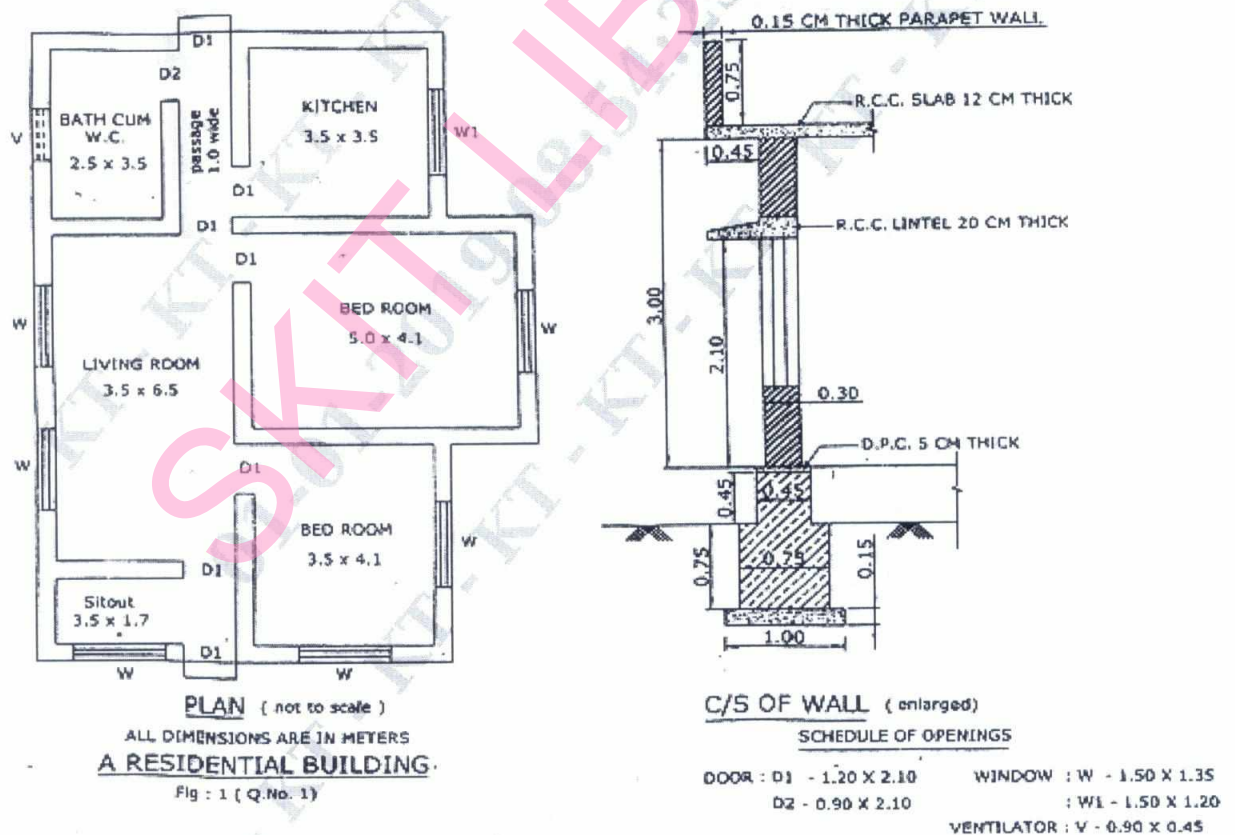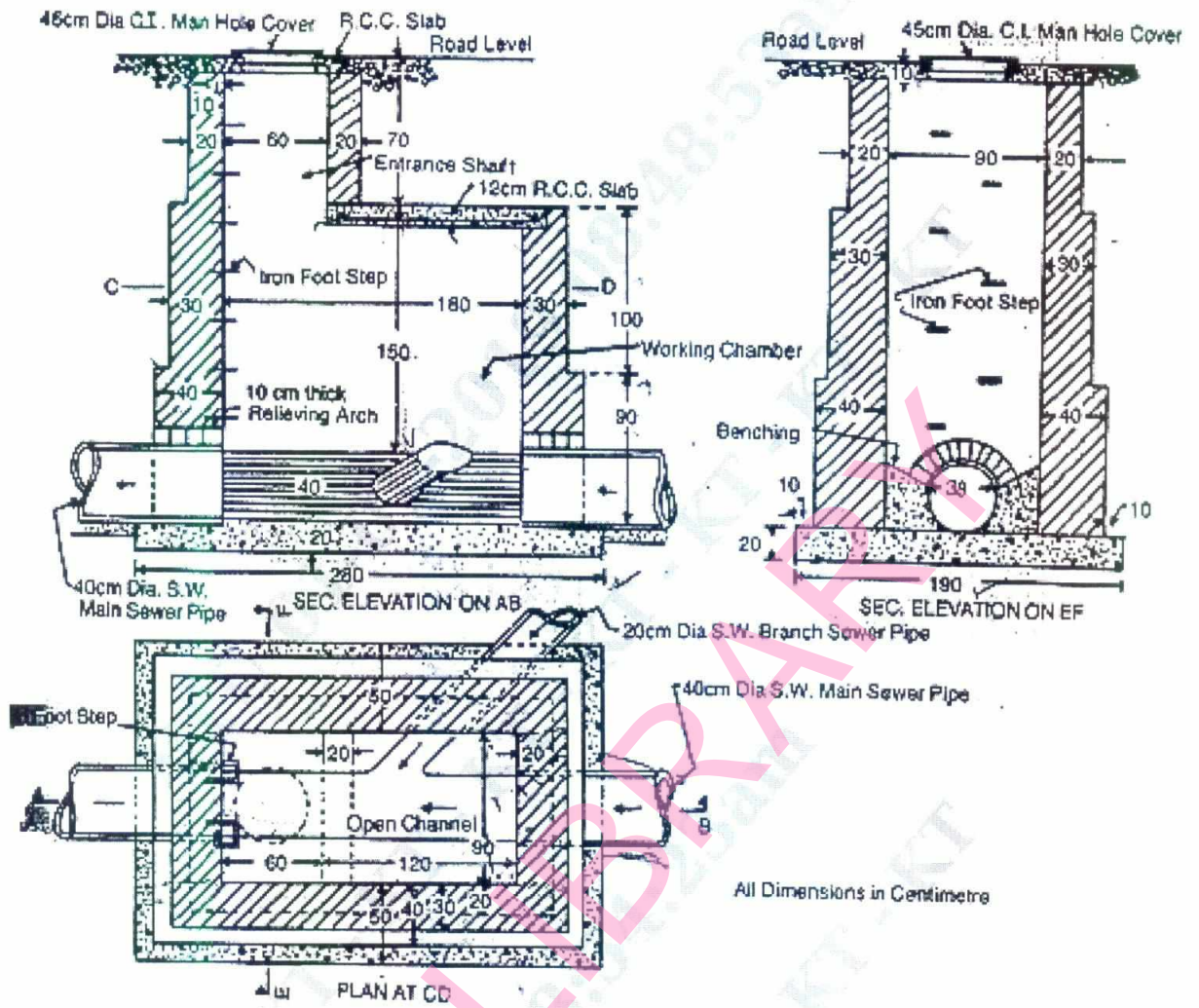d.   Measurement Book
e.   Sinking Fund.   **(15 Marks)**

PLAN (not to scale)
ALL DIMENSIONS ARE IN METERS
A RESIDENTIAL BUILDING
Fig : 1 (Q.No. 1)

C/S OF WALL (enlarged)
SCHEDULE OF OPENINGS
DOOR : D1 - 1.20 X 2.10   WINDOW : W - 1.50 X 1.35
       D2 - 0.90 X 2.10   : W1 - 1.50 X 1.20
                              VENTILATOR : V - 0.90 X 0.45

Fig.Q1

45cm Dia C.I. Man Hole Cover · R.C.C. Slab · Road Level

Road Level · 45cm Dia. C.I. Man Hole Cover

10
20 · 60 · 20 · 70

20 · 90 · 20

Entrance Shaft

12cm R.C.C. Slab

C · 30 · Iron Foot Step · 180 · 30 · D · 100

30 · Iron Foot Step · 30

150 · Working Chamber

40 · 10 cm thick Relieving Arch

Benching · 40 · 40

90

90

40 · 30

10 · 38 · 10

20 · 40 · 20

20 · 280 · 190

40cm Dia. S.W. Main Sewer Pipe

SEC. ELEVATION ON AB

SEC. ELEVATION ON EF

20cm Dia S.W. Branch Sewer Pipe

40cm Dia S.W. Main Sewer Pipe

Foot Step

50 · 20 · 20

Open Channel · 90

60 · 120

50 · 40 · 30 · 20

All Dimensions in Centimetre

PLAN AT CD

Fig.Q2

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10CV74

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019
Design of Pre-stressed Concrete Structures

Time: 3 hrs.

Max. Marks:100

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

PART – A

1 a. Explain different methods of imparting precompression to concrete. **(05 Marks)**
  b. State why high strength concrete and high strength steel is used in Prestressed Concrete stress. **(05 Marks)**
  c. Explain with neat sketches, Fressinet system of post tensioning. **(05 Marks)**
  d. Describe with three examples significance of using different cable profile in PSC beams. **(05 Marks)**

2 a. A concrete beam of symmetrical I section of simply supported span 10 m has a width and thickness of flange 250 mm and 80 mm respectively. The overall depth is 500 mm. The thickness of web is 80 mm. The beam is prestressed by a parabolic cable with an eccentricity of 150 mm below centroidal axis at midspan and concentric at supports. The effective prestress in the cable is 200 kN. The beam supports a liveload of 3 kN/m. Compute the fibre stress at midspan under working load. At what eccentricity the fibre stress at bottom become zero at working load? **(12 Marks)**
  b. A prestressed simply supported beam of span 12 m and size $300mm \times 600mm$ has a parabolic cable with zero eccentricity at support and eccentricity of 125 mm below centroida axis at midspan. The effective prestress in steel is 820 Mpa and area of steel is 1600 mm². If no tensile stresses are permitted at service load (uniformly distributed load), determine the load factor against cracking, assuming modulus of rupture of concrete as 4.2 MPa. **(08 Marks)**

3 a. List the various factors influencing loss of pre stress in pre tensioned and post tensioned PSC beams. **(04 Marks)**
  b. A PSC beam 200 mm × 300 mm is prestressed with wires of area 300 mm² located at an eccentricity of 100 mm below centroidal axis at midspan and zero eccentricity at supports, carries an initial stress of 1000 N/mm². The span of the beam is 10 m. Calculate the percentage loss of stress in wires if, (i) the beam is pre tensioned (ii) the beam is post tensioned using following data:

$E_S = 210 \, kN/mm^2$; $E_C = 35 \, kN/mm^2$

Relaxation of stress in steel = 5% of initial stress shrinkage strain in concrete for pretensioning = 300×10^{-6}. Age of concrete at transfer for post tensioned beam = 8 days, Creep coefficient = 1.6, Slip at anchorage = 2 mm, Coefficient of friction between concrete and cable = 0.55, Friction coefficient for wave effect = 0.0015/m. **(16 Marks)**

4 a. Why PSC members will have relatively lesser deflection compared to RCC member under working loads? **(03 Marks)**

b. A post tensioned beam (bonded) $300mm \times 600mm$ has a prestress of 1560 kN in tendons immediately after prestressing which eventually reduces to 1330 kN due to losses. The beam is simply supported over a span of 12 m and carries concentrated loads of 44.5 kN each at a distance of 4.5 m from supports. The tendon is parabolic with zero eccentricity at support and 120 mm below centroidal axis at midspan. Calculate deflection at midspan due to,

    (i)   Prestress + self weight.

    (ii)   Prestress + self weight + live load.

$E_C = 35$ kN/mm^2. **(17 Marks)**

PART – B

5 a. A double T section post tensioned bonded beam having a flange 1200 mm wide and 150 mm thick is prestressed by 4700 mm^2 of HTS at an effective depth of 1600 mm. The ribs have thickness of 150 mm each. If the cube strength of concrete is 40 N/mm^2 and tensile strength of steel is 1600 N/mm^2, determine the flexural strength of double T girder using IS 1343 provisions. **(12 Marks)**

b. A post tensioned beam with unbounded tendons is of rectangular section 400 mm wide with an effective depth of 800 mm, is prestressed by steel cables of area 2840 mm^2 with an effective force of 900 MPa. The effective span of beam is 16 m. If fck = 40 MPa, estimate the ultimate moment of resistance using IS 1343 code provisions. **(08 Marks)**

6 a. A prestressed T section has a flange width of 600 mm and the thickness of the flange is 230 mm. Thickness of rib is 150 mm. Total depth of beam is 1300 mm. fck = 45 MPa and characteristics strength of tendon is 1500 MPa. Effective stress in tendons after all losses = 900 MPa. Area of steel = 2300 mm^2. At a particular section beam is subjected to an ultimate moment of 2130 kNm and shear force of 237 kN. Effective prestress at extreme tensile face of beam (fpt) = 19.3 MPa. Calculate the ultimate shear resistance of beam at that section. **(10 Marks)**

b. The support section of PSC beam is $100mm \times 250mm$ shear force at that section is 70 kN. The compressive prestress at the centroidal axis 5 MPa. fck = 40 MPa, fy = 415 MPa. Cover to reinforcement is 50 mm. Design suitable shear reinforcement as per IS 1343 provisions. **(10 Marks)**

7 a. Write a note on transmission length in pre tensioned members. **(06 Marks)**

b. The end block of a post tensioned beam is $450mm \times 550mm$. Four cables, each made up of 8 wires of 12 mm diameter strands and carrying a force of 1150 kN are anchored by plate anchorages, $150mm \times 150mm$, located with their centres at 125 mm from the edges of the end block. The cable duct is of 50 mm diameter. The cube strength of concrete at transfer is 25 N/mm^2. Check for bearing stress as per IS 1343 provisions. Design suitable anchorage for the end block. **(14 Marks)**

8 Design a pre tensioned PSC I section for roof purlin to suit the data below:

Effective span = 6 m, Applied load = 6 kN/m, Load factors for dead load = 1.5 and for live load = 1.6. Permissible compressive stress at transfer and working load = 15 N/mm^2, Permissible stresses in tension at transfer = 1 N/mm^2. No tensile stress at working load is permitted. 7 mm HTS wires of ultimate tensile strength = 1600 N/mm^2 are available for use. Take fck = 50 N/mm^2, $E_C = 34$ N/mm^2, Loss ratio = 0.75. Tensile strength of concrete $f_t = 1.7$ N/mm^2. **(20 Marks)**

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Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. What do you understand by the term design vehicle? How does it affect geometric design? **(05 Marks)**

b. State the IRC values of various design control elements for roads–wherever applicable. **(05 Marks)**

c. Enumerate the concept of PCU in geometric design along with the list of factors affecting PCU. Also present the typical IRC values recommended for rural road in plain terrain. **(10 Marks)**

2 a. How does the pavement surface characteristics affect the performance of a highway. **(06 Marks)**

b. In a district, where the rainfalls is heavy, state highway (SH) of bituminous concrete pavement and water bound macadam of 7m wide are to be constructed. Calculate the height of the crown with respect to the edges in these two cases. **(04 Marks)**

c. Explain : i) traffic separators and kerbs
ii) Requirements of ideal road humps. **(10 Marks)**

3 a. Define SSD and with neat sketches present the requirements of sight distance at curves and intersections. **(08 Marks)**

b. The speed of overtaking vehicle passing in national highway is 100kmph with overtaking acceleration 1.92kmph/sec.
  i) Calculate the safe OSD
  ii) Draw neat sketches of overtaking zone
  iii) Check whether adequate length for OSD is available within 500m where an obstruction exists and if there is no oncoming vehicle. Assume suitable data as per IRC. **(12 Marks)**

4 a. Explain briefly the effect of centrifugal force on horizontal curve having no super elevation. **(06 Marks)**

b. List the reasons why extra widening is required at horizontal curve. **(04 Marks)**

c. Design all the geometric features of a horizontal curve for a national highway passing through rolling terrain in heavy rainfall area. Assume all the data as per IRC for a ruling minimum radius. Also assume pavement is rotated about the inner edge. **(10 Marks)**

PART – B

5 a. Explain various types of gradients and grade compensation **(10 Marks)**

b. A vertical curve is formed by a descending gradient of 1 in 50 which meets an ascending gradient of 1 in 30. Design the length of curve to fulfill both comfort condition and head light sight distance requirements for a design speed of 80kmph. Assume $c = 0.6 \text{m/sec}^2$. Also determine the location of culvert from flatter grade. **(10 Marks)**

6 a. With neat sketches channelizing island and gap in median at junction. **(08 Marks)**

b. Write a note on atgrade junctions. **(06 Marks)**

c. Explain the situations at which grade separated intersections and median openings are justified. **(06 Marks)**

7 a. Stating the advantages and disadvantages of a rotary intersection, explain the step by step methods involved in the design. **(10 Marks)**

b. With neat sketches explain clover leaf and diamond intersections. **(10 Marks)**

8 a. Explain design procedure of filter material. **(05 Marks)**

b. List the importance of good drainage system in highway. **(05 Marks)**

c. The maximum quantity of water expected in one of the open longitudinal drains on clayey soil is $0.9 m^3$/sec. design the cross section and longitudinal slope of trapezoidal drain assuming the bottom width of the trapezoidal section to be 1.0m and cross slope to be 1V to 1.5H. The allowable velocity of flow in the drain is 1.2m/sec and Manning's coefficient n = 0.02. **(10 Marks)**

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10CV757

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019
Solid Waste Management

Time: 3 hrs.

Max. Marks:100

Note: 1. *Answer FIVE full questions, selecting at least TWO questions from each part.*
2. *Substantiate with neat sketches, wherever necessary.*

PART – A

1 a. Define the terms : i) Solid waste   ii) Solid waste management.   **(04 Marks)**

   b. Define Land pollution. What are the causes effects and control methods?   **(08 Marks)**

   c. List the methods used to estimate the waste quantities. With a neat sketch, explain the material balance analysis along with equation.   **(08 Marks)**

2 a. Estimate unit solid waste generation rate for residential area having 1200 houses with 5 persons/house. The observation made for a week at the disposal site revealed following details.

Vehicle	No. of loads	Average volume, m^3	Density kg/m^3
Truck	10	10	350
Tractor	10	1.50	150
Private vehicle	20	0.30	100

                                                                                          (06 Marks)

   b. With a neat sketch, explain Garbage chute.   **(06 Marks)**

   c. Solid wastes from a commercial area are to be collected using a mechanically self loading compactors stationary collection system having $4m^3$ containers. Determine the approximate truck capacity with following data :

   i)   Container size   = $4m^3$
   ii)   Container utilization factor   =   0.75
   iii)   Average number of containers at each location   =   2
   iv)   Collection vehicle compaction ratio   =   2.5
   v)   Container unloading time   =   0.1h/container
   vi)   Average drive time between container locations   =   0.1h
   vii)   One way haul distance   =   30km
   viii)   Speed limit   =   88 km/h
   ix)   Time from garage to first container location   =   0.33h
   x)   Time from last container location to garage   =   0.25h
   xi)   No. of trips to disposal site per day   =   02
   xii)   Length of work day   =   8h

   Assume : W = 0.15, s = 0.1h/trip, a = 0.016, b = 0.011.   **(08 Marks)**

3 a. Define the term 'size reduction' list the common type of devices used to reduce the size of MSW. With a neat sketch, give the salient features of any one.   **(07 Marks)**

   b. Enumerate the objectives of components separation of MSW. List the types of devices commonly used for separation of solid waste material. Give the schematic diagram of any one with salient features.   **(07 Marks)**

   c. Explain the magnetic separation, hand sorting and air separation component separation techniques.   **(06 Marks)**

4 a. Define Pyrolysis .With a flow diagram, explain the process. (06 Marks)
   b. What is Incineration? With a neat sketch, explain the process. (07 Marks)
   c. What are the air pollution control devices used in conjunction with incinerator? Explain.
   (07 Marks)

PART – B

5 a. With a neat sketch, explain mechanical method of composting. (07 Marks)
   b. With a neat sketch, explain aerated static pile composting. (07 Marks)
   c. Define 'vermicomposting'. Explain the procedure of vermicomposting. (06 Marks)

6 a. List and explain the factors governing the selection of a site for sanitary land fill. (07 Marks)
   b. What is leachate? Discuss the control of leachate movement is a sanitary land fill. (08 Marks)
   c. Design a sanitary land fill to serve population of 31000 with following data :
      i) Solid waste generation   :   1.9 kg/capita/day
      ii) Compacted density of solid waste in land fill   = $474.6 \ kg/m^3$
      iii) Uncompacted density of solid waste   = $907.2 \ kg/m^3$
      iv) Average depth of compacted solid waste   =   3.1m
      (05 Marks)

7 a. List and explain the methods used for biomedical waste disposal. (08 Marks)
   b. Discuss the salient features of "The Bio-medical waste (management and Handling) rules 2000. (07 Marks)
   c. Discuss the merits and demerits of Hog feeding with solid wastes. (05 Marks)

8 a. List and explain the different principal technologies used for material and energy recovery from MSW and also applications in other industries. (10 Marks)
   b. List and explain the types of plastics found in municipal solid waste. How these plastic are numerically coded with schematics, explain the same. (10 Marks)

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2 of 2

Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019
Pavement Materials and Construction

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. List the types of tests to be conducted on road aggregates. Explain :
      i) Impact test   ii) Los Angles abrasion test.   **(12 Marks)**
   b. With the aid of graph explain Roth Futch's method for gradation of aggregates.   **(08 Marks)**

2 a. Explain how bitumen is produced from crude oil.   **(06 Marks)**
   b. Write the properties of bitumen.   **(06 Marks)**
   c. List the differences of bitumen and tar.   **(08 Marks)**

3 a. Discuss the details of cutback and its types.   **(10 Marks)**
   b. Mention the significance of bitumen adhesion to aggregates. Explain how the bitumen
      adhesion is evaluated.   **(05 Marks)**
   c. Write a note on Emulsion.   **(05 Marks)**

4 a. Explain how the optimum bitumen content is determined.   **(10 Marks)**
   b. The specific gravities and weight proportion for aggregates and bitumen are as under the
      preparation of Marshal misc design. The volume and weight of one Marshall specimen was
      found to be 475CC and 1100 gm. Assume absorption of bitumen in aggregate is zero, find
      V_v, V_b, VMA and VFB.

Item	A – 1	A – 2	A – 3	A – 4	Bitumen
Wt (gm)	825	1200	325	150	100
Sp. Gr	2.63	2.51	2.46	2.43	1.05

(10 Marks)

PART – B

5 a. With neat sketch explain : i) Drag line   ii) Power shovel.   **(10 Marks)**
   b. Discuss the various factors that control the design of highway embankment.   **(10 Marks)**

6 a. Explain the objects of compaction and effect of inadequate compaction. Discuss the
      advantages and applications of various compacting equipment for construction of subgrade
      and embankments.   **(10 Marks)**
   b. Enumerates the steps for preparation of subgrade. Explain the various quality control tests
      carried out during the preparation of subgrade.   **(10 Marks)**

7 a. Explain the construction steps and specification for bituminous concrete pavement.
                                                                            (10 Marks)
   b. Write a note on construction of Dense bituminous macadam pavement.   **(10 Marks)**

8 a. Explain : i) Expansion Joints   ii) Contraction joints.   **(10 Marks)**
   b. Write the specifications of material for cement concrete pavement slabs.   **(10 Marks)**

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Seventh Semester B.E. Degree Examination, Dec.2018/Jan.2019
Air Pollution and Control

Time: 3 hrs.   Max. Marks:100

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

PART – A

1. a. Define Air Pollution. Explain primary and secondary air pollutants with examples.
   (10 Marks)
   b. Distinguish between Photo chemical smog and Coal induced smog, with examples.
   (10 Marks)

2. a. Explain the effects of Air pollution on human health. (10 Marks)
   b. List the major air pollution episodes. Explain briefly Bhopal gas tragedy. (10 Marks)

3. a. With neat sketch, explain plume behaviour in different atmospheric conditions. (10 Marks)
   b. What is Inversion? Explain different types of inversions. (10 Marks)

4. a. Explain the factors influencing the industrial plant location and planning. (10 Marks)
   b. Define Noise. Discuss in brief the various sources of noise. Write a brief note on noise abatement and control. (10 Marks)

PART – B

5. a. Describe the sampling train, with the help of neat sketch. (10 Marks)
   b. Explain the procedure for measurement of Suspended particulate matter (SPM) in ambient air using high volume air sampler, with a neat sketch. (10 Marks)

6. a. Explain with a neat sketch, the principle and construction of fabric filter. Also give its applications. (10 Marks)
   b. Explain Air pollution due to gasoline and diesel vehicles. (10 Marks)

7. Write short notes on :
   a. Indoor Air Pollution.
   b. Ozone depletion in stratosphere.
   c. Global warming.
          (07 Marks)
          (06 Marks)
          (07 Marks)

8. Write short notes on the following :
   a. Ambient Air quality standards.
   b. Wind rose diagram.
   c. Air pollution inventory.
   d. Electrostatic separators.
          (05 Marks)
          (05 Marks)
          (05 Marks)
          (05 Marks)

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