SUBJECT CODE NO:- K-13
FACULTY OF ENGINEERING AND TECHNOLOGY
B.E. (Civil) Examination Oct/Nov 2016
Structural Mechanics
(Revised)

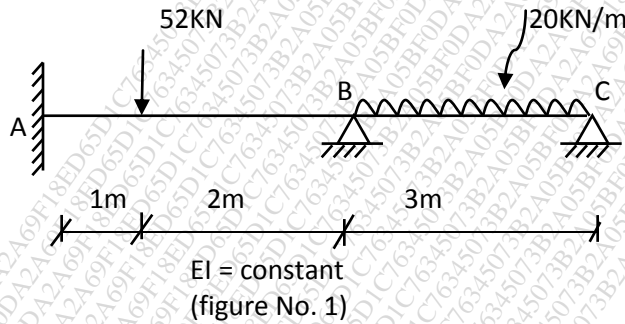[Time: Three Hours]   [Max.Marks:80]

Please check whether you have got the right question paper.

N.B
1) Solve any three questions from section A and section B each.
2) Use of non programmable calculator is permitted.
3) Make any suitable assumptions if required and state it clearly.

Section A

Q.1   a)   Derive governing differential equations of equilibrium for a three dimensional state of stress.   07
      b)   Write strain displacement relations for three dimensional state of strain. Hence, derive compatibility   07
           conditions for three dimensional state of strain.

Q.2   Analyse the continuous beam as shown in the figure 1) using stiffness matrix method and hence draw BMD for   13
      the same.

EI = constant
(figure No. 1)

Q.3   For the state of stress given below; find the magnitude of principal stresses and direction cosines of major   13
   principal stress.

$$\sigma_{ij} = \begin{bmatrix} 30 & -10 & 70 \\ -10 & 20 & 40 \\ 70 & 40 & 50 \end{bmatrix} \text{ MPa}$$

Q.4   Derive with usual notations, governing differential equation of deflected shape of cylindrical bending of thin   13
      rectangular plate. $\nabla_\omega^4 = \frac{q}{p}$

Q.5   a)   State and explain assumptions made in theory of plates.   04
      b)   State and explain properties of stiffness matrix.   04
      c)   Explain various boundary conditions and its effects on analysis of plates.   05

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Section B

Q.6 Analyse the portal frame shown in the figure2), using stiffness matrix method and hence draw BMD for the same. 14
EI= Constant.
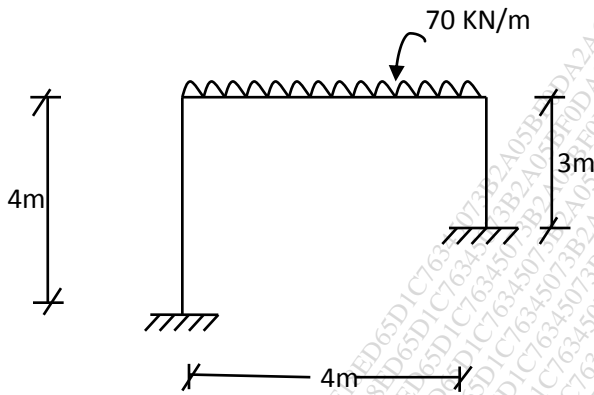
Q.7 a) What do you understand by degree of static indeterminacy and degree of kinematic indeterminacy? 06
Explain with at least one example of beam and frame each.
b) Differentiate between flexibility matrix method and stiffness matrix method of structural analysis. 07

Q.8 Explain in details stepwise procedure of finite element method. Used for analysis of structures. 13

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

Q.10 Derive governing differential equation for defected shape of circular plate subjected to uniformly distributed load 13
of per unit area.

2016

SUBJECT CODE NO:- K-71
FACULTY OF ENGINEERING AND TECHNOLOGY
B.E. (Civil) Examination Oct/Nov 2016
Professional Practice
(Revised)

[Time:Three Hours]   [Max. Marks:80]

Please check whether you have got the right question paper.

N.B   i) Q.No.1 is compulsory and 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 wherever necessary.

Section A

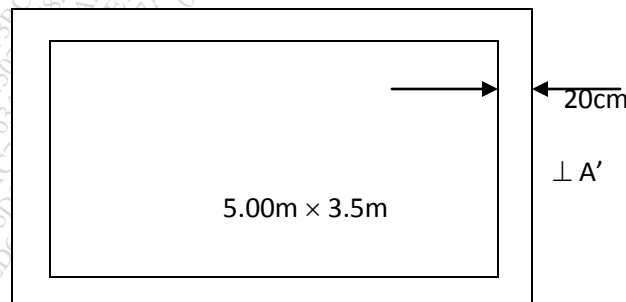Q.1   Workout the quantities of the following item from the given drawing. (fig.1)   20
          a)   Earth work in Excavation
          b)   P.C.C (1:4:8) in foundation
          c)   1st class brick work in C.M. (1:3)
          d)   2.5 cm thick artificial stone flooring.
          e)   16mm thick C.M Mortor (1:3) internally

S/C A-A'

Plan

2016

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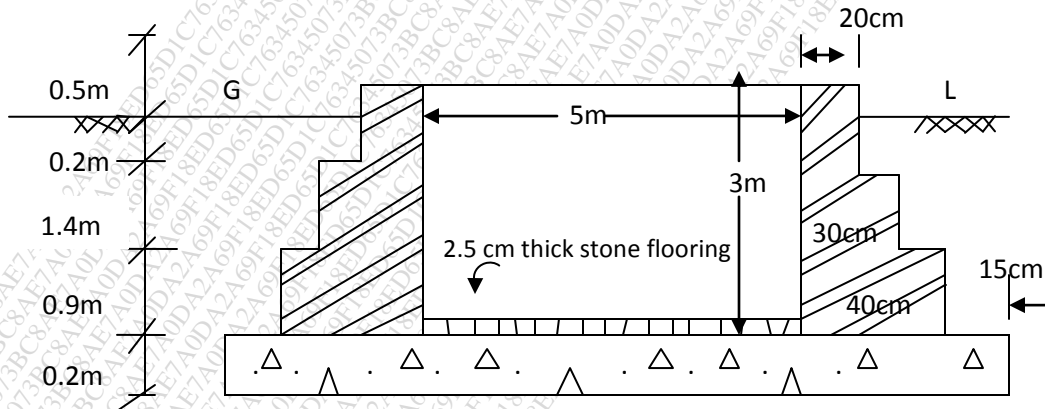
Q.2   Write the detailed specification for
      a) R.C.C Slab work (1:2:4) 10cm thick   05
      b) Plastering in C.M. (1:4) on new brick work surface.   05

Q.3   Carry out the rate analysis for:
      a) P.C.C. (1:4:8) for foundation Pad work.   05
      b) Two coat plastering in C.M. (1:3)   05

Q.4   Explain the following:
      a) D.S.R and other schedule   04
      b) Provisional sum   02
      c) Approximate estimate of building   04

Section B

Q.5   Explain the following in detail.
      a) Arbitration   02
      b) Contract document   04
      c) Scrutiny and award of tenders   04
      d) Factors affecting value of building   04

Q.6   a) Discuss the essentials of valid contract in detail.   06
      b) Explain the several ways by which the contact can be terminated.   07

Q.7   a) Explain procedure for formation & registration of c0o-operativehousing society.   06
      b) Explain administrative approval & technical sanction.   07

Q.8   a) Enumerate the various aspects of information to be included in a tender notice.   06
      b) What is depreciation? Describe various methods for determining depreciation.   07

Q.9   Write short note on:
      a) N.A. Concept   04
      b) Mortgage   04
      c) Housing loans, EMI & repayment conditions.   05

2016

SUBJECT CODE NO:- K-101
FACULTY OF ENGINEERING AND TECHNOLOGY
B.E. (Civil) Examination Oct/Nov 2016
Advanced Structures [Elective-II]
(Revised)

[Time:Three Hours]   [Max. Marks:80]

Please check whether you have got the right question paper.

N.B   i) Solve any two questions from each section.
                       ii) Use of IS 456-2000 and non-programmable calculator is allowed.

Section-A

Q.1   A building rests on six columns 400mm square, arranged in two rows of three each, the distance between the   20
      columns being 5m c/c.The load on corner columns are 600 KN each and that of other columns are 1000 KN each.
      The moment due to mind load on the length of the building about the base of raft is   1500 KNm. if safe bearing
      capacity of the supporting soil is 60 KN/m^2 design the following by limit state method. use minimum desirable
      grade of reinforced concrete as suggested in IS 456-2000 and Fe 415,
      a.   slab
      b.   Intermediate secondary beam
      c.   Calculate loading on main beam.

Q.2   A column 500 mm square carries an axial load of 1200 KN. and is supported on three piles driven to Hard strata at
      a depth of 12 m. The column is placed at centroid of pile group and the c/c distance of the piles is restricted to 2-
      0m. Use M20 and Fe 415 steel. Design by limit state method.
      a)   Pile showing detailing of reinforcement with sections.   08
      b)   Pile cap, showing required reinforcement detailing.   12

Q.3   A contractor wants to construct a recreation hall in a city. The hall is circular in shape of dia 10.0 m. the   20
      Rec slab is to be supported by circular beam placed over equally spaced six columns. The slab-carries
      superimposed load of 5.50 KN/m^2, inclusive self-wt. The beam also supports brick wall of thick. 230 mm, having
      height as 4.0m. The density of masonry work is 18.50 KN/m^3 Design circular beam by L.S.M. Using M20 and Fe
      415. Show reinforcement detailing. Consider following data

20	Ks.	Km	K_T	Ø
60	0.089	0.045	0.009	12.75^0

Section-B

Q.4   a)   Write short notes on,   06
           1.   As recommended by FRC 6-2000 which are the various live load combinations considered for design of
                bridge? Write the same for four carriage way width.
           2.   Dispersion of load along span.
      b)   Draw a neat sketch for FRC class AA loading for wheeled vehicles, starting clearly it's various provisions.   06
      c)   What is effective width method for analysis of slab? How the solid deck slab spanning in one direction is
           analyzed for single concentrated load by effective width method, as recommended by FRC 21-2000?   08

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Q.5   a) When a negative reinforcement is to be provided in continuous deep beam, how the distribution of the   06
         reinforcement is done m.r.t. clear span to D ratio. Explain with neat sketches for following cases,
         i)   When L/D= 1to 2.5
         ii)   When L/D > 2.5
         iii)   When L/D < 1
      b) The total weight of the contents and hopper bottom of bunker having four walls of size 4.0 m height and
         4.70 m length is 840 KN. The thk of wall is 150 mm. the bunker is supported on four columns located at   14
         the corners. Adopting M20 and Fe 415 grade steel, design the walls of bunkers considering them as a deep
         beam. Also show detailing of reinforcement .use L.S.M.

Q.6   a) Which are the various loads acting on tower, explain.   05
      b) Which are various types of transmission towers and what is it's utility in load resistance.   05
      c) Draw neat sketches in support of structural behavior of folded plates and enumerate the assumptions on   05
         which the analysis of plates is based.
      d) Write down the salient steps for analysis of plates by Whitney's method   05

2016

SUBJECT CODE NO:- K-104
FACULTY OF ENGINEERING AND TECHNOLOGY
B.E. (Civil) Examination Oct/Nov 2016
Industrial Waste Treatment [Elective-II]
(Revised)

[Time: Three Hours]   **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B   i) Q.No.1 from section A and Q.No.6 from section B are compulsory.
        ii) Answer any two questions among the remaining questions (i.e. 2to 5) of section A and any two
        questions (i.e. 7 to 10) of section B.
        iii) Neat diagram must be drawn wherever necessary.
        iv) Assume suitable data, if required clearly stating the relevant assumption.

Section A

Q.1   a) Explain Oxygen sag curve.   05
      b) Explain scope and Importance of EIA.   05

Q.2   a) What do you mean by strength reduction and how it is accomplished in Industrial Effluent process? 07
      b) Explain zones of pollution in the stream with neat diagram.   08

Q.3   a) Explain volume reduction process   07
      b) A city discharges sewage at the rate of 1200Lit/second into a stream whose minimum flow is   08
          5000Lit/second the temperature of both being 20^0C. The 5 day BOD at 20^0C for sewage 160mg/Lit
          and that of river water is 2mg/Lit, The DO content of sewage is zero (0) while that of stream is 90%
          of the saturation Dissolved oxygen. Find out the degree of treatment required if minimum D.O. to
          be maintain in the stream 4mg/lit. Assume deoxygenation coefficient as 0.1 and reoxygenation
          coefficient as 0.3, given saturation D.O at 20^0C as 9.17 mg/Lit

Q.4   a) Explain zoning of Industry and also explain its importance.   07
      b) Explain Effluent standards for Disposal of Industrial waste as per Indian standards.   08

Q.5   Write short notes on (any three)   15
      a) EIS
      b) Economics of ECO
      c) Equalization
      d) Environmental Audit
      e) By product recovery

Section B

Q.6   a) Explain manufacturing process as well as waste recovery from sugar Industrial waste.   05
      b) Explain High rate anaerobic filters.   05

Q.7   a) Explain Reverse osmosis process with neat diagram.   07
      b) What do you mean by Radio Activity? Explain Treatment and disposal methods.   08

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Q.8   a) Draw the neat flow chart of Effluent treatment plant with Activated sludge process as a secondary 07
                  treatment and Explain.

          b) Explain Nitrification and Denitrification. 08

Q.9   a) What are the characteristics of waste from Dairy industry? Discuss the treatment to be given. 08

          b) Explain design criteria of oxidation pond based on Kinetics. 07

Q.10 Write short notes on (any three) 15
          a) F/M ratio
          b) Efficiency of BOD removal
          c) Air stripping
          d) Chemical precipitation
          e) By product recovery

2016

SUBJECT CODE NO:- K-186
FACULTY OF ENGINEERING AND TECHNOLOGY
B.E.(CIVIL) Examination Oct/Nov 2016
Environmental Engineering-II
(Revised)

[Time:Three Hours] **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B
 i) Q.No.1 of section A and Q.No.6 of section B are compulsory.
 ii) Answers any two questions among the remaining questions (i.e. 2 to 5) of section A and any two
 question (i.e. 7 to 10) of section B.
 iii) Assume suitable data. Mention it clearly.

Section A

Q.1 Answer the following question. 10
 a) What do you mean by time concentration? State its significance in sewer line.
 b) A 20 cm dia , sewer is laid at a slope of 0.004 and is designed to carry a discharge at a depth of
 10 cm with manning's n=0.014. What is design Discharge?
 c) State the five parameters of effluent standards for sewage disposal into land surface.
 d) List the effect of sewage on environment?
 e) What is meant by sewage sickness?

Q.2 a) State the different sources of waste water that are produced from a community? Discuss the 07
 systems of sewerage with its merits and demerits.
 b) Calculate diameter and discharge of a circular sewer laid at a slope in 1 in 500 when running half 08
 full and with a velocity of 2m/s, N=0.012.

Q.3 a) BOD of a sewage incubated for 2 days at 30°C was found to be 160 mg/lit. What would be its 5 days 08
 20°C BOD. Assume k(base 10) at 20°C as 0.12 per day.
 b) Explain 1st stage and second stage BOD. 07

Q.4 a) State the Effluent standard for disposal of waste water on land, river and irrigation. 07
 b) Discuss in detail self-clearing and non-Scouring velocity. 08

Q.5 Write short note. (any three) 15
 a) Sewage pumping.
 b) Skimming tank.
 c) Flow Diagram of waste water treatment.
 d) Combined and separate sewerage system.

Section-B

Q.6 a) Differentiate between suspended growths and attach growth process with suitable example. 10
 b) State the objective and functioning principal of secondary treatment unit.
 c) Differential between unit operation and unit process in waste water.
 d) State the purpose of sludge thickness.
 e) What is sedimentation?
 f) State the necessity of waste water characterization.

2016

Q.7　　　Design a conventional activated sludge　　　　　　　　　　　　　　　　15
　　　　　Plant
　　　　　Population-35000
　　　　　Avg. sewage flow-180 lpcd
　　　　　BOD of sewage-220 mg/lit
　　　　　BOD removed in primary treatment-30%
　　　　　Overall BOD reduction -85%
　　　　　F/M ratio=0.33
　　　　　MLSS=2000 mg/lit
　　　　　Sludge volume Index=100

Q.8　　　a)　Explain working of oxidation pond.　　　　　　　　　　　　　　　　08
　　　　　b)　Explain conventional trickling filter regarding its operation, filter media and performance.　　07

Q.9　　　a)　What is solid waste? What are disposal technics of solid waste? Explain any one in detail.　　07
　　　　　b)　Explain process of "anaerotic sludge digestion" with effect of temp on digestion period.　　08

Q.10　　Write short note. (any three)　　　　　　　　　　　　　　　　　　　15
　　　　　a)　UASBR.
　　　　　b)　Aerated lagoons.
　　　　　c)　Rotating Biological Contractors.
　　　　　d)　Glute Chalmers

2016

SUBJECT CODE NO:- K-317
FACULTY OF ENGINEERING AND TECHNOLOGY
B.E.(Civil) Examination Oct/Nov 2016
Elective-I: Prestressed Concrete
(Revised)

[Time:Three Hours]   **[Max. Marks:80]**

Please check whether you have got the right question paper.

N.B
      I.   Solve <u>three</u> <u>questions</u> from section A & B each.
    II.   Use of IS 1343, IS 456 & non programmable calculator is allowed.
   III. Assume suitable data & state it clearly.

Section A

Q.1   A prestressed concrete T-beam is to be designed to support impose load of 4.5KN/m over an effective span   13
of 5m. The beam is made up of flange $400 \times 40mm$, web is $100 \times 200mm$ stress in concrete shall not exceed
15 N/mm^2 in compression & zero in tension at any stage. Check the adequacy of section provided. Find
minimum possible prestressing force & corresponding eccentricity if loss ratio is 0.8.

Q.2   A T-girder at a bridge having top flange 600mm wide & 230 mm deep. The web 1500 mm deep & 150 mm   13
thick has effective span of 20m. The tendons at 2300 mm^2 are parabolic with eccentricity 650 mm at mid
span & 285 mm at the support. The effective prestress in the tendon is 900MPa. Find the ultimate shear
resistance at the support s/c at the maximum permissible working U.d.l on the beam. If the factor of safety is
1.75. Use M$_{45}$ grade of concrete.

Q.3   An I-shape prestressed concrete beam has dimensions, flange is 450mm $\times$ 100mm, web 600 mm $\times$ 100mm   13
tendon is located at 50 mm from soffit. Area of prestressing tendon is 750 mm^2. Find ultimate moment of
resistance also find the U.d.l including its own weight over a simply supported span of 10m. Take
fck = 40N/mm^2 & fp =1500 N/mm^2.

Q.4   End block of a prestressed concrete beam rectangular in c/s is 100 mm wide & 200 mm deep. The   13
prestressing force of 100 KN is transmitted to concrete by distribution plate 100mm wide & 50mm deep
concentrically at the end. Calculate the position & magnitude of maximum tensile stress on a horizontal
section through the centre of anchor plate.

Q.5   Write a short note on.   14
    1)   Advantages & disadvantages of prestressed concrete member over RCC member.
    2)   Need of high strength concrete & steel.
    3)   Advantages & disadvantages of pretensioning system.

2016

Section B

Q.6 A prestress concrete beam of span 15m carries U.d.l of 10 KN/m exclusive of self wt. over the entire span. **13**
The c/s of beam is unsymmetrical I-s/c having top flange 400 mm wide & 120mm deep. The bottom flange
300 ×200mm & web is 150mm thick. The overall depth is 920mm. The prestressing force is applied by 3
cables each consisting of 15 wires of 5mm diameter stress initially to 1000 N/mm². The cables are 80mm
above the soffit. Find the stresses at mid span for the following condition.
1) Pre stress + self wt.
2) Pre stress + self wt. + live load.

Q.7 Design an electric pole 14m high to support wires at top which can have reversible horizontal force of 2200N. **13**
The tendons are initially stressed to 1100 N/mm²& loss of stress due to shrinkage & creep is 12%. Maximum
compressive stress in concrete shall be limited to 15MPa.
Take m=6, Q=30⁰, soil wt. =18.5 KN/m².

Q.8 A precast pretensioned beam of rectangular c/s has width of 100 mm & depth of 200mm. The beam with **13**
effective span 5m. prestressed by the tendon with their centroid coincides with bottom kern. Initial stress in
tendon is 150KN, loss of prestressed may be assumed 15% beam is corported in composite T-beam by casting
top flange 400mm wide & 40mm thick. If the composite s/c supports l.l of 8KN/m². Calculate resultant stress
developed in precast & cast in situ concrete. Assuming beam as
1) Unpropped.
2) Propped modular of elasticity of concrete in precast & cast in-situ slab.

Q.9 A post-tensioned pre stress concrete beam of 15m span is subjected to initial prestress of 1400 KN **13**
transferred at 28 days strength of concrete the cable is parabolic with maximum eccentricity of 450 mm at
the centre of span. Take A= 24 ×10⁵ mm².
I =5.5 ×10¹⁰ mm⁴
E_s=2.1 ×10⁵ N/mm²
E_c =0.36 ×10⁵ N/mm²
μ=0.3
K = 0.0012/m
Δ =2.0 mm
A_s = 1300 mm²
Determine all losses of prestress.

Q.10 Write short note on. **14**
1) Different prestress system.
2) Need of high strength concrete & steel.
3) Advantages & dis-advantages of pre-tensioning system.

2016

SUBJECT CODE NO:- K-318
FACULTY OF ENGINEERING AND TECHNOLOGY
B.E.(Civil) Examination Oct/Nov 2016
Elective-I: Town Planning
(Revised)

[Time: Three Hours]   [Max. Marks:80]

Please check whether you have got the right question paper.
N.B   i) Attempt <u>any three Questions</u> from each section.

Section A

Q.1	a)	Explain the necessity & principles of town planning.	06
	b)	Explain the concept of town planning in Ancient India.	07

Q.2	a)	Write a note on Uthwatt Commission.	06
	b)	Explain first public health of solitary act of G.B.	07

Q.3	a)	Explain the concept of town in feudal period.	06
	b)	Explain different problem arises due to Urbanisation.	07

Q.4	a)	What are the bye laws? Explain bye law related to set back with typical example.	06
	b)	Write a note on Dudley report.	07

Q.5   Write a note on following (<u>any three</u>)   14
    a)   Garden city
    b)   Bombay town planning Act 1915.
    c)   Need for organic planning
    d)   Fire protection bye law.

Section B

Q.6	a)	Explain necessity & objectives of Master plan.	06
	b)	Write a note on village planning.	07

Q.7	a)	Explain the concept of Neighbourhood unit with neat sketch.	06
	b)	Write a note on different agencies for housing in India.	07

Q.8	a)	What are slums? What are effects of slums.	06
	b)	Explain origin & destination survey.	07

Q.9   a)   Define following terms :   06
      i.   Spot speed
      ii.   Running speed
      iii.   Time-mean speed
    b)   Write a note on parking survey.   07

Q.10   Write note on <u>any three</u> of following :   14
    a)   Site selection for Industries.
    b)   Planning of Public buildings
    c)   Cul-de-sec
    d)   Smart city

2016

SUBJECT CODE NO:- K-320
FACULTY OF ENGINEERING AND TECHNOLOGY
B.E.(Civil) Examination Oct/Nov 2016
Elective-I: Plumbing Engineering
(Revised)

[Time: Three Hours]   [Max. Marks:80]

Please check whether you have got the right question paper.

N.B   i) Figures to the right indicate full marks.
        ii) Question No. 1 and Question No. 6 are compulsory. Solve any two questions from remaining each section.

Section A

Q.1   Draw complete activity flow chart for plumbing and sanitation work.   10

Q.2   a)   Explain in detail role and responsibility of the plumbing consultant.   08
        b)   Enlist the List of Drawing's to be submitted by the plumbing consultant. Explain any two in detail. 07

Q.3   A centrifugal pump is used to supply the cold water to the roof tank located at the top of Ten floor's   15
        building. Building consists of 35 flats. Each flat is occupied by 6 persons. Calculate the efficiency of pump.

Q.4   a)   What is plumbing engineering? Explain in detail various objectives of plumbing as per UPC-I-2008- 08
             India.
        b)   Explain checklist of plumbing work in detail.   07

Q.5   a)   What is vent? Enlist various types of vent. Explain all vent's in detail with neat sketch.   08
        b)   Write in detail DO's and Don'ts for plumbing work.   07

Section B

Q.6   Draw complete constructional sequence of Flow Chart for the drainage works.   10

Q.7   A combined sewer design for a city having population 37,000. The daily per capita water supply allowance 15
        being 135 litre of which 80%. Find its way into the sewer, the slope of sewer is 1 in 625 and sewer should
        be designed to carry four times the dry weather flow when running full. Calculate velocity of flow when
        running full conditions.

Q.8   a)   What do you mean by solar water? Explain with neat sketch solar hot water distribution with   08
             neat sketch in residential building.
        b)   Explain with neat sketch one pipe and two pipe sanitary drainage systems for residential building. 07

Q.9   a)   What are the various methods of piping layout for hot water circulation system? Explain any two 08
             systems with neat sketch?
        b)   Calculate velocity and quality of waste drainage of a sewer running full. The diameter of sewer is 07
             200mm. It is layed at a gradient of 1 in 200. Use manning's formula.

Q.10   Explain with neat sketch construction of Inspection chamber and manhole. Use UPC-I-2008 India   15
        Guidelines.

2016

Subject Code : 102

FACULTY OF ENGINEERING & TECHNOLOGY
B.E. (Civil) (Revised) Examination
NOVEMBER/DECEMBER, 2016
(Elective – II)

Pavement Design

Time: Three Hours

Max. Marks : 80

"Please check whether you have got the right the question paper"

Note: i) *Attempt any three question from each section.*
ii) *Assume suitable data wherever necessary*

SECTION - A

Q.1 (a) Explain the term :   06

   (i) Equivalent single wheel load.

   (ii) Equivalent single axle load.

(b) Explain different type 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 stores in steel = 1400 kg/cm^2

   (vii) Permissible bond stress = 24 kg/cm^2

(b) Using Westergaard's equation calculate stresses in rigid pavement at corner edge, and interior from following data: 06

   (i) Wheel load = 5000 kg

   (ii) Modulus of elasticity = 2.5 x 10^5 kg/cm^2

   (iii) Poisson ratio = 0.15

   (iv) Slab thickness = 20 cm

   (v) Modulus of subgrade reaction k = 6.0 kg/cm^3

   (vi) Radius of contact area = 15 cm.

Q.3 (a) Explain the different type of joint in rigid pavement with neat sketch.   06

(b) What is mechanistic method? Explain layered elastic model for designing flexible pavement.   07

Q.4 (a) Design a flexible pavement by 'Ashtoo' method from following data : **08**

    (i) Subgrade CBR = 3.0%

    (ii) ESAL = 3.5 million

    (iii) Reliability needed = 95%

    (iv) Standard deviation = 3.0

    (v) The serviceability loss = 25

    (vi) Base course CBR = 25%

    (vii) Drainage condition is good with saturation time more than 25% for all layer.

Q.4 (b) Explain Burmister's method of flexible pavement. **05**

Q.5 Write note on following :

    (i) ASHTOO Rood test **05**

    (ii) Releability **04**

    (iii) Types of pavement. **05**

SECTION - B

Q.6 (a) Enlist different mechanistic method for rigid pavement and explain any one in detail. **07**

    (b) Explain different temperature stresses in rigid pavement. **06**

Q.7 (a) What is composite pavement? Explain its merits and demerits. **06**

    (b) Explain French method of composite pavement design. **07**

Q.8 (a) Write a note on pavement type selection processes. **07**

    (b) Explain different factor 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 South African method for design of composite pavement. **06**

Q.10 Write a note on following

    (i) Life cycle cost analysis **05**

    (ii) Vehicle operation cost **04**

    (iii) Highway proposal submitted. **05**

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K – 2016

SUBJECT CODE NO:- K-218
FACULTY OF ENGINEERING AND TECHNOLOGY
B.E.(CIVIL) Examination Oct/Nov 2016
Water Resources Engineering-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 6 are compulsory.
             ii) Solve any two questions from the remaining questions from each section.
             iii) Figures to the right indicate full marks.
             iv) Assume suitable data if necessary.

Section A

Q.1	Solve any five	10
	1) What is meant by a dam and a reservoir?	
	2) Classify the types of reservoirs.	
	3) What do you mean by reservoirs capacity, what are methods of determining the reservoir capacity?	
	4) What is a gravity dam? Draw a typical cross section of such a dam?	
	5) Differentiate between low and high gravity dam.	
	6) What are earthen dams and in what circumstances are they preferred.	
	7) What are spell ways and where are they provided?	
	8) What are arch and buttress dams?	

Q.2   a)   What is meant by flood routing through reservoirs? Discuss the modified Pul's method.   08
      b)   Explain the mass curve method to determine the capacity of a reservoir in detail.   07

Q.3   a)   Write detail notes on   08
           i)   Forces acting on gravity dams.
           ii)   Stability analysis of gravity dams.
      b)   Explain in detail   07
           i)   Drainage gallery
           ii)   Construction joints in gravity dams

Q.4   a)   Explain   08
           i)   Seepage failures in earthen dams.
           ii)   Pore pressure and its significance in relation to earthen dam construction.
      b)   Define & explain phreatic line in earthen dams.   07

Q.5   Write short notes   15
           i)   Energy dissipation below spillways
           ii)   Ogee spillway
           iii)   Best central angle of an arch dam.

2016

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Section B

Q.6   Solve any five   10
1) What do you mean by "Afflux"?
2) What are the functions of canal head regulator?
3) What are divide walls?
4) What is meant by piping in hydraulic structures?
5) What are the different types of weirs?
6) What are canal falls and where they are located?
7) Draw a neat sketch of super passage.
8) Explain the function of cross regulator.

Q.7   a) Enumerate and explain briefly the different method for control of entry of silt into canals.   08
       b) Discuss the use of 'guide banks' and marginal bunds in a river regulating scheme.   07

Q.8   a) Write a note on Bligh's creep theory.   07
       b) Explain the design procedure of a vertical drop weir on Bligh's theory.   08

Q.9   a) Write short notes on   08
       i)   Sarda type fall
       ii)   Roughening devices
       b) What are canal escapes, explain in detail?   07

Q.10   Write short notes   15
1) Modules and their importance in canal irrigation system
2) Syphon aqueduct
3) Types of cross drainage works.

2016

SUBJECT CODE NO:- K-249
FACULTY OF ENGINEERING AND TECHNOLOGY
B.E.(CIVIL) Examination Oct/Nov 2016
Design of Structures- III
(Revised)

[Time:Four Hours]   [Max. Marks:80]

Please check whether you have got the right question paper.

N.B
- I.   Solve any two questions from section A & B each.
- II. Use of IS: 456, IS: 3370 and non-programmable calculate is allowed.
- III. Assume suitable data, if necessary & state it clearly.

Section A

Q.1   What are the advantages of flat slab construction? Design an interior panel of $6m \times 8m$ of a flat slab to carry   20
a live load of 4 KN/m^2 and floor finish of 1.0 KN/m^2. Draw neat sketches to illustrate the details of
reinforcement.

Q.2   a)   Define a combined footing. Discuss the situations in which combined footing in designed.   03
      b)   Design a combined rectangular footing for two columns, each 500mm × 500mm and each carrying   17
           load of 1500 KN. The available width is restricted to 2.2m. Take SBC of soil 200 KN/m^2. Columns are
           spaced 4.2m apart. Use M$_{20}$ and Fe$_{500}$ grades. Show reinforcement detailing.

Q.3   A counter fort retaining wall to retain earth 7m above ground level with level top. The foundation rests on a   20
stratum 1.5m below the ground level. The retained earth carries a superimposed load of 15 KN/m^2 at the top.
The retained earth has density of 16 KN/m^2 and of repose 30^0. The foundation stratum has a SBC of
260 KN/m^2 and$\mu = 0.6$.
      a)   Calculate preliminary sizes of all the components.
      b)   Design the stem wall.
      c)   Draw neat sketches to show reset detailing. Take spacing of counter fort =3m c/c.

Section B

Q.4   a)   Explain design procedure for a circular slab for various and conditions as   10
           i)   Fixed edge.
           ii)   Simply supported edges.
           iii)   Partially fixed edges.
      b)   Explain the Freyssinet system of prestressing using neat sketches.   10

Q.5   Design an elevated rectangular water tank of capacity 30, 000 litres. Design walls and base slab of water tank,   20
walls are fixed at base and free at top. Use M$_{30}$ and Fe$_{415}$ grades. Assume L/B ratio as 1.6. Draw neat sketches
of reinforcement detaining. Use Is code method.

Q.6   a)   Write essential requirements of formwork.   04
      b)   Explain with neat sketches the formwork used for various components such as column, beam and   08
           floor slab.
      c)   Explain the concept of prestressing given below.   08
           i)   Prestressing to transform concrete into an elastic material.
           ii)   Prestressing for combination of high strength steel and concrete.
           iii)   Prestress to achieve load balancing.

2016

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SUBJECT CODE NO:- K-282
FACULTY OF ENGINEERING AND TECHNOLOGY
B.E.(Civil) Examination Oct/Nov 2016
Foundation Engineering
(Revised)

[Time: Three Hours]   [Max. Marks:80]

Please check whether you have got the right question paper.
N.B
    i.   Solve any three questions from the two sections each.
    ii.   Assume suitable data wherever necessary and state it clearly.
    iii. Draw neat sketches wherever required.

Section A

Q.1	a)	How the depth of exploration and lateral extent of investigation is decided? Discuss?	07
	b)	Explain "wash boring method" of sub soil exploration in detail.	07
Q.2	a)	Derive the Terzaghi's expression for bearing capacity of soil for square and circular footing.	07
	b)	Discuss the eccentricity of loading on the bearing capacity of soil.	06
Q.3	a)	What are the causes and control measures adopted for settlement of soil?	06
	b)	Discuss the following.	07
		i. Immediate settlement.	
		ii. Consolidation settlement.	
		iii. Differential settlement.	
Q.4	a)	Discuss the procedure for proportioning of footing for equal settlement.	07
	b)	Discuss cantilever footing in detail.	06
Q.5		Write short notes on:	13
		i. Floating foundation.	
		ii. Electrical resistivity method.	
		iii. Open foundation.	

Section B

Q.6	a)	What is under reamed Pile foundation? Discuss its design procedure.	07
	b)	What is negative skin friction? What is its effect on the Pile?	07
Q.7	a)	Discuss different types of wells, their component parts and the choice of particular type.	07
	b)	Explain the construction of open box caution.	06
Q.8	a)	Explain why drainage of foundation is necessary? Describe various methods of soil drainage.	07
	b)	What is special about black cotton soil? What techniques are practiced in the design and construction on black cotton soil?	06
Q.9	a)	Explain different types of cofferdams with neat sketches.	07
	b)	What are sheet Piles and sheet Pile Waiting? Discuss.	06
Q.10		Write short notes on:	13
		i. Tilt of well foundation.	
		ii. Effect of Pile drawing on ground.	
		iii. Design of circular cofferdam.	

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