Total No. of Printed Pages:2

SUBJECT CODE NO:- H-488
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (Civil)
Advanced Surveying
(REVISED)

[Time: Two Hours]   **[Max.Marks: 40]**

Please check whether you have got the right question paper.

N.B   1. Q.No.1 and Q.No.5 are compulsory.
         2. Answer any two questions from section A and section B.
         3. Figures to right indicate the maximum marks.
         4. Assume suitable data if necessary, and state the same very clearly.

Section A

Q.1   Answer the following question: (any three)   06
         a) Define terrestrial photogrammetry?
         b) Explain tilt distortion in photographic survey.
         c) Explain shore line surveying?

         d) Define:-
             i)   Camera Axis
             ii)   Picture plane

         e) Use of sounding rods, poles and lead line.

Q.2   Explain the three point problem with graphical solutions in hydrographical surveying.   07

Q.3   What is sextant box explains the use of it in surveying?   07

Q.4   The scale of an aerial photograph $25cm \times 25cm$ is km = 10m. Determine the number of   07
         Photographs required to cover an area of $20\ km \times 15\ km$. If the longitudinal overlap is 60% and the
         side overlap is 30%

Section B

Q.5   Answer the following question: (any three)   06
         a) What are the essentials of a GIS?
         b) Explain Ground Control in Aerial Survey.

         c) Define:-
             i)   Air base
             ii)   Crab

         d) Define photo-interpretation. How does it differ from remote sensing?
         e) Elaborate the four M's for which geographical information is used.

1

5F59D4FB8CB1999E24B310E70C977C52

Q.6   Explain briefly the aspects of flight planning for an aerial survey.   07

Q.7   Discuss briefly electromagnetic energy and electromagnetic spectrum.   07

Q.8   Write a note on application areas of GIS and remote sensing?   07

5F59D4FB8CB1999E24B310E70C977C52

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-157
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (Civil)
Geotechnical Engineering
(REVISED)

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

Please check whether you have got the right question paper.

N.B   1) Q.1 & Q.6 are made compulsory. Solve any two questions from remaining questions of
             each section.
             2) Assume suitable data if required & state it clearly.

Section A

Q.1   Attempt any five.   10
       a) What is mean by consistency of soil?
       b) Define equipotential line.
       c) What is adsorbed water & Capillary water?
       d) Draw soil sample as a three phase in terms of voids ratio & porosity.
       e) What is swelling of soil?
       f) What is zero air void line?
       g) What is soil thixotropy?

Q.2   a) A soil strata consist of 3 layers of soil thickness 1m, 1.5m & 2.0m having coefficient of permeability   08
          of 3×10^{-3} cm/sec , 4.5×10^{-3} cm/sec , & 3×10^{-3} cm/sec , respectively. Estimate the
          average coefficient of permeability in the direction
          i)   Parallel to the bedding plane
          ii)   Normal to the bedding plane.
       b) What is the classification of soil? Explain Indian Standard Classification?   07

Q.3   a) What are the different soil indices used in identification of soil? Describe each briefly. Give their   08
          uses.
       b) Derive an expression to determine coefficient of permeability of course grain soil by laboratory test. 07

Q.4   a) What is optimum moisture content? Explain factors affecting compaction?   07
       b) Derive the relation between bulk density, specific gravity. Void ratio degree of saturation & density 08
          of water.

Q.5   a) Discuss Terzaghi's theory of consolidation by stating the various assumption & its validity.   08
       b) Discuss primary & secondary consolidation   07

Section B

Q.6 Attempt any five. 10
    a) Define semi infinite soil mass
    b) What do you mean by shear strength of soil?
    c) Enlist slope failure.
    d) What is stability curve?
    e) Draw the sketch showing variation of earth pressure with the movement of the wall.
    f) Enlist the method to determine shear strength.
    g) What is 2:1 stress distribution method?
    h) Under what condition box test issued?

Q.7 a) Explain shear characteristics of sand? 05
    b) In an unconfined compression test, a sample of sandy clay 8 cm long 24 cm in diameter fails under a 10
       load of 120KN at 10% strain. Compute the shearing resistance taking into account the effect of
       change in cross section of the sample.

Q.8 a) Explain Taylor's Stability number. 08
    b) Discuss Swedish method & its application to dry cohesive soils. 07

Q.9 a) What are the assumptions made in Rankine theory. Justify any two. 08
    b) Enlist the different cases of cohesion less backfill to be considered to calculate earth pressure. 07
       Explain any one of them.

Q.10 Short notes(Attempt any three) 15
    a) Determination of elastic modulus from triaxial test.
    b) Classification of slope failure
    c) Stability curve
    d) Unconfined compression test
    e) Contact pressure
    f) Boussinesq's equation for point load.

Total No. of Printed Pages:2

SUBJECT CODE NO: H-123
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (Civil)
Design of Structures - II (RCC)
(REVISED)

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

Please check whether you have got the right question paper.

N.B
    i.   <u>Question No. 1 and 6 are compulsory</u>. <u>Answer any two</u> from section A & section B.
    ii.   Assume suitable data if necessary.
    iii.   Figures to right indicate the maximum marks.
    iv.   Use of non – programmable calculator is allowed.
    v.   Use of IS: 456 – 2000 is permitted.

Section A

Q.1   a) What are the advantage and disadvantages of providing large clear cover to reinforcement   03
            in flexural member?
    b) Enumerate the different types of limit state with brief description.   04
    c) Why is the provision of minimum reinforcement in Reinforced concrete beam?   03

Q.2   Design simply supported beam of span 6M. is to carry A uniform dead load of 20KN/M. inclusive   15
of self wt of beam. and uniform live load of 30KN/M. The width of the support is 230mm. assume
M – 25 concrete and Fe – 415.

Q.3   Design cantilever beam of span 2.75 Mt. is to carry A uniformly distributed load of 20 KN/M.   15
The width of the support is 230mm. Assume M – 25 concrete and Fe- 500. Show the curtailment of
reinforcement.

Q.4   a) What is mean by cracking? Explain the types of cracks.   03
    b) A beam $300mm \times 560mm$ effective is subjected to a factored bending moment 310KN.   12
          Determine the area of steel for doubly reinforced section. Use M – 20 concrete and Fe –
          250 steel. Assume $d' = 50mm$.

Q.5   An Isolated simply supported T – Beam has flange width 2300MM and flange thickness of   15
120MM, the effective span of the beam is 3.5 meter. The effective depth of the beam is 580MM
and width 300MM. The beam having the reinforcement with 8 – 20 MM Tor use M20 and Fe 415
grade determine the moment of resistance of the section.

1

123

Section B

Q.6 Explain the following terms. 10
   a) Development length and necessity of the check.
   b) Necessity of torsion reinforcement in the slab.
   c) Relationship for the load carrying capacity of an axially loaded short column.
   d) One – way slab and Two – way slab.

Q.7 Design a reinforced concrete slab for a room $4.2M \times 6.5M$ supported on a beam of Width 250MM. 15
The slab is continuous over all supports, carrying a live load of $4KN/M^2$ & floor finish $1.0\ KN/M^2$ assume mild exposure. Fe – 415 grade steel.

Q.8 Design a dog legged stair case for a residential building having a room size $5m \times 2.5M$. Floor to 15
floor height is 3M. The column size $230MM \times 380MM$ take live load $3KN/M^2$ & floor finish
load $0.9KN/M^2$ Use M20 and Fe – 415 grades.

Q.9 Design isolated footing for square column $500mm \times 500mm$ reinforced with 8 bars of 20mm 15
diameter. And carrying axial load of 2000KN, S B C of soil is $300KN/M^2$ at a depth of 2.0m
below ground level. Assume M25 grade of concrete & Fe- 415 grade of steel. Show the
reinforcement in details.

Q.10 Design a rectangular column subjected to ultimate load of 2000KN. The column is 3.5M long & 15
effectively held position at both ends but not restrained against rotation.
Take M- 20 & Fe – 500 grades.

Total No. of Printed Pages:3

SUBJECT CODE NO: H-193
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (Civil)
Water Resource Engineering - I
(REVISED)

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

Please check whether you have got the right question paper.

N.B
i. Question no. 1 and question no. 6 are compulsory.
ii. Attempt any two questions from remaining questions from each section.
iii. Figures to right indicate the maximum marks.
iv. Assume suitable data, if necessary

Section A

Q.1   Attempt **any five.**   10

a) Enlist the various practical applications of hydrology.
b) What are the points to be kept in mind for selection of Rain – gauge site?
c) What do you mean by evaporimeter? Enlist various evaporimeters.
d) Define infiltration and percolation.
e) Define rainfall excess and effective rainfall.
f) What is meant by base flow separation?
g) Define stream gauging.
h) What are the objectives of flood frequency analysis?

Q.2   a) Discuss the various methods available to estimate the missing precipitation record.   09

b) The total observed runoff volume during 8h storm with a uniform intensity of   06
$1.8\ cm/h$ is $25 \times 10^6 m^3$. If the area of the basin is $250 km^2$,find the average
infiltration rate for the basin.

Q.3   a) What do you understand by synthetic unit hydrograph? Explain how it is derived.   06

b) The following are the ordinates of a storm hydrograph of a river draining a catchments   09
area of $500\ km^2$ due to a $6 –$ hour isolated storm. Derive the ordinates of a $6 –$ hour
unit hydrograph for the catchment.

Time from start of storm	0	6	12	18	24	30	36	42	48	54	60	66	72
Discharge(m^3/s)	0	10	60	90	130	180	220	170	135	100	65	30	10

Assume base flow of $10.0\ m^3/sec$.

Q.4   a) Explain with a neat sketch the method of measuring the velocity at a point in a stream   07
by using a current meter.

b) Explain with neat sketch different types of precipitation?   08

Q.5   Write a short note on (any three)   15
        a) Hydrologic cycle.
        b) Factors affecting evapotranspiration process.
        c) Unit hydrograph derivation
        d) Gumbel's distribution.

Section B

Q.6   Attempt any five   10

        a) State Darcy's law
        b) Define porosity and permeability.
        c) Differentiate between confined aquifer and unconfined aquifer.
        d) What are the functions of irrigation water?
        e) Explain the term delta and duty.
        f) A crop requires a total depth of 82cm of water for a base period of 110 days. Find the duty of water.
        g) What is the necessity of watershed development?
        h) Define waterlogging, and what are the ill effects of water logging?

Q.7   a) Derive an expression for discharge from a well in unconfined aquifer the well fully penetrates it.   08

        b) A tube well penetrates fully in a 7.0m thick confined aquifer with coefficient of permeability of $0.002 m/sec$. The well radius is 15cm and drawdown is 6.0m. Calculate the discharge from the well. What will be the percentage increase in discharge if radius of well is doubled? Take radius of zero drawdown is 400m in each case.   07

Q.8   a) Define the following: 08
        i.   Root zone depth
        ii.   Kor depth and kor period
        iii.   Culturable commanded area
        iv.   Water conveyance efficiency

        b) Find the capacity of a soil for the following data: 07
        i.   Root zone depth = 3m
        ii.   Existing water content = 7%
        iii.   Dry density of soil = $1.7 \ g/cm^3$
        iv.   Water applied to the soil = $430 m^3$
        v.   Water loss due to evaporation etc. = 12%
        vi.   Area of plot = 1250sq. meters.

Q.9   a) Explain with neat sketches different watershed structures in drainage line treatment.   08

         b) Write a short note on remedial measure of water logging.   07

Q.10   Write a short note on (<u>any three</u>):   15

         a) Recuperation test
         b) Irrigation water standards
         c) Crop rotation and important crops in India.
         d) Interference among wells

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-314
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (Civil)
Engineering Geology
(REVISED)

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

Please check whether you have got the right question paper.
N.B   i) Q.1 is compulsory & solve any two from the remaining question from section 'A'.
             ii) Q.6 is compulsory & solve any two from the reaming question from section 'B'
             iii)Neat diagram must be drawn whenever necessary.

Section A

Q.1   Write short Notes(any five)   10
        a) Igneous Rock
        b) Metamorphism
        c) Plunge fold
        d) Volcano
        e) Dyke & sill
        f) Pot holes
        g) Thermal metamorphism.

Q.2   a) What is sedimentary rock? Give the classification of sedimentary rock with example of each   08
            type.

        b) What if fold ? Explain any four types of fold   07

Q.3   a) What is fault ? Explain any four types of fault   08

        b) Explain Dip, strike and true dip.   07

Q.4   a) What is earthquake? What are the causes of earthquake.   08

        b) What is aquifer? Explain types of aquifer.   07

Q.5   a) Explain the terms   08
            1. Seismogram
            2. Waterfall
            3. Love wave

        b) Explain rejuvenation of river & valley development in young stage of river.   07

314   1

Section B

Q.6   Write note on (any five)   10
       a) Over break in tunnels
       b) Tides of dam
       c) Prevention of landslides
       d) Water table
       e) Core logging
       f) Artesian well
       g) Water loss during drilling .

Q.7   a) Explain preliminary geological investigation for selecting dam site.   08

       b) Discuss the suitable condition for reservoir site.   07

Q.8   A) What difficulties will have to face if.   07
       a) Tunnelling in fault zone.
       b) Strike of inclined bed along the tunnel.

       B) What is drilling? Explain different types of drilling in details.   08

Q.9   A) Explain in details importance of Geology in civil Engineering   07

       B) What kind of precaution to be taken to prevent the Landslides   08

Q.10   A) What difficulties have to face if   08
       a) Dams built across strike of rocks
       b) Dyke expose at dam site.

       B) Explain in detail rain Harvesting.   07

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-293
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (Civil)
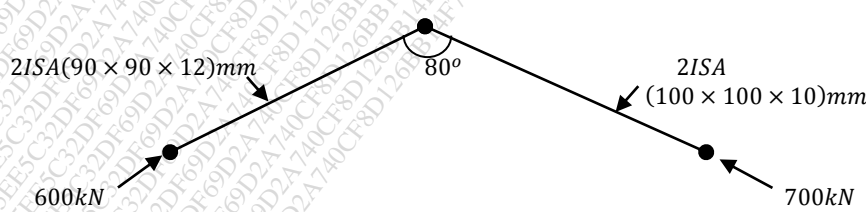**Design of Structure - I (Steel)**
(REVISED)

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

Please check whether you have got the right question paper.

N.B
      i) Solve any *two* questions from question no. 2 to 5 and any *two* question no.7 to 10.
      ii) Question no.1 and Question no.6 are compulsory.
      iii) assume suitable data if necessary and mention it clearly
      iv) use IS 800:2007 , Steel Table and Non-Programmable Calculator is allowed
      iv)figures to the right indicate the maximum marks

SECTION A

Q.1   Answer the following questions(<u>any five</u>):   10
      a. Explain common shapes of compression member?
      b. What is limit state method?
      c. What are the different types of welded connection?
      d. Write down difference between steel structure and concrete structure by design point of view?
      e. What is riveting?
      f. Explain failure of welded joint?
      g. Draw different cross sections of steel?

Q.2   An inclined truss member consists of 2 angles 100×75×10mm connected back to back with longer   15
leg connected to the gusset plate 12mm thick. Design the bolted joint to transfer a design force of
$1000 \ kN$. Steel Fe 410 and bolts are of grade 4.6.

Q.3   a. Write the procedure for design of battering which should cover all the guidelines as per IS?   08
      b. A compression member is made $up \ of \ ISHB$ 300@ $577N/m$, if length of column is 6m long 07
         and has pinned at both ends. Determine the maximum load carrying capacity?
         $[use, fy = 250MPa \ \& \ fu = 450MPa]$

Q.4   a. Design connections for members of roof truss, with gusset plate 12mm thk, as shown in the   08
         fig.1using 16mm dia. HSFG bolt of grade 8.8

$2ISA(90 \times 90 \times 12)mm$ 80° $2ISA$
$(100 \times 100 \times 10)mm$
$600kN$ $700kN$

      b. Design connections from members of roof truss, with gusset plate 12mm thick, as shown in   07
         fig.1. Use welded connections. Assume ultimate strength of steel $450MPa$ and filed welded

293   1

Q.5   Write short notes on (Any three):   15
       a. Block shears strength for bolted and welded connections
       b. Design of steel structures
       c. Difference between riveting and bolting
       d. Types of welds
       e. Beam-column connection

SECTION B

Q.6   Answer the following questions (Any five)   10

       a. How laterally unsupported beam differs from laterally supported beam?
       b. Enlist different stiffeners in plate girder?
       c. Draw a neat sketch of Howe truss and showing all its components?
       d. What is plate girder?
       e. Explain bracing system?
       f. Explain local buckling of flanges?
       g. What is the gantry girder?

Q.7   A $30kN$ hand-operated crane is provided and has following data :   15
       a. Center to Center distance of the gantry beam =15m
       b. Span of gantry=$6.0m$
       c. Weight of the crane=$40kN$
       d. Spacing of wheel=3m
       e. Weight of the crab=$10kN$
       f. Minimum hook approach=1m
           Design a simple supported gantry girder assuming lateral support to it

Q.8   a. Explain the design procedure of laterally unsupported beam   05
       b. A simply supported beam has span of 8m laterally supported and it carries a udl of $50\ kN/m$ 10
           and point load $50kN$ at its center. Design the cross section and check for shear & deflection.

Q.9   A Plate girder is simply supported over an effective span of 40m. It carries a $udl\ of\ 40\ kN/$ 15
           m in addition to its self weight and two point load of 300000N each at 10m from their
           supports. It is fully restrained at both ends against lateral buckling throughout the span.
           Take $fy = 250MPa$. Design welded plate girder.

Q.10   Write short notes on (Any three)   15

       a. Explain combined bending and shear in beam
       b. Explain in detail dead load and live load on trusses
       c. Differentiate between slab base and gusseted base
       d. Draw neat sketch of Pratt truss showing all its components
       e. Beam connections

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-265
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (Civil)
Transportation Engg.- II
(REVISED)

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

Please check whether you have got the right question paper.
N.B   i) Q.No.1 and 6 are compulsory.
             ii) solve any two questions from the remaining of each section.

Section A

Q.1   What are the significant recommendations of Jayakar committee Report? Mention how this helped   10
        in road development in India.

Q.2   a. Discuss the factors to be considered in deciding the sight distance at intersections.   07

        b. What are the desirable properties of subgrade soil? Enumerate the identification and   08
            classification tests of soil.

Q.3   a. Explain the necessity and objects of highway planning.   07

        b. Drive the expression for stopping sight distances on plain road.   08

Q.4   a. Write a short note on : i) NHDP (national highway development program)   ii) IRC (Indian   08
            road congress)

        b. What are the desirable properties of bitumen? Explain penetration test in detail   07

Q.5   Discuss the Analysis of overtaking sight distance on the two way road, Assumptions made in OSD   15
        analysis . and how the various components of OSD are determined

Section B

Q.6   Explain spot speed, running speed, space mean speed, time mean speed and average speed of   10
        vehicle.

Q.7   a. Explain in detail the construction of WBM road.   07

        b. Enlist and explain different types of joints in rigid pavements.   08

Q.8   a. Explain various causes of pavements failure.   07

        b. What are various types of traffic island used .Explain the use of each.   08

6BB14F7725EE5C32DF69D2A74092336F

Q.9   a. Explain the construction process of cement concrete road.   07

           b. Enlist various types of equipment and machinery used for road construction. Explain any one of them.   08

Q.10   Explain Group Index method of pavement design. What are the limitations of this method.   15

Total No. of Printed Pages:02

SUBJECT CODE NO:- H-348
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (Civil)
Building Planning & Design
(REVISED)

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

Please check whether you have got the right question paper.

N.B
1. Question no.1 and question no.6 are compulsory.
2. Solve any two questions from question no.2 to 5 and any one from question no. 7 to 8.
3. Figures to right indicate the maximum marks.

Section A

Q.1   Attempt any five   10
   a) Give the aspect and its justification of dining room and living room.
   b) Define internal privacy and external privacy.
   c) Define FSI. What are the common values of FSI for residential and commercial buildings?
   d) What are the standard dimensions of store room, kitchen room, WC separate, master bed?
   e) Enlist the factors which affect the selection of site.
   f) What is the difference between blue print and ammonia print?
   g) Enlist the different types of sanitary fittings/wares.

Q.2   a) Enlist the different principles of building planning and explain any two in detail.   08
   b) Explain with neat sketch functional treatment and mass composition.   07

Q.3   a) Explain the building byelaws with reference to height limitation.   08
   b) What is section? What are the points to be kept in mind while drawing a section?   07

Q.4   a) Explain with neat sketch different types of Traps used in building services.   08
   b) Enlist the different principles of house drainage.   07

Q.5   a) How the protection of south side is made with the help of different sun breakers and shady   08
    trees.
   b) Explain with neat sketch single stack system and one pipe system partially ventilated.   07

Section B

Q.6 Plan and design a residential bungalow for a family in new Aurangabad town using following data:
- h) Plot size $9m \times 12m$
- i) Scale 1:50
- j) Plinth height 0.45m
- k) Required components: Ent. Verandah, , living room, bedroom, master bed, separate W.C., bath, kitchenroom, store room & stair case-doglegged.

    Draw :
a)	Working plan	06
b)	Locate the position of columns in plan	04
c)	Elevation	05
d)	Section through staircase	06
e)	Schedule of opening	04

Q.7 Draw a general layout of factory building (line plan layout) and list out the requirements of big industrial unit.   15

Q.8
- a) Differentiate between one point perspective and two point perspective.   08
- b) Explain with neat sketch soft landscape and hard landscape.   07

2

Total No. of Printed Pages:04

SUBJECT CODE NO:- H-418
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (Civil)
Theory of Structure - 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. Answer any Two from Section A & section B.
ii) Assume suitable data if necessary state if clearly.
iii) Figures to right indicate the maximum marks.
iv) Use of non-programmable calculator is allowed.

Section A

Q.1   a) Define shape factor and find shape factor for a triangle of base b and height h.   04
      b) Explain load factor.   03
      c) Find the collapse load for simply supported beam with central point load.   03

Q.2   Analyse the frame as shown below by column analogy method and draw bending moment   15
      diagram.
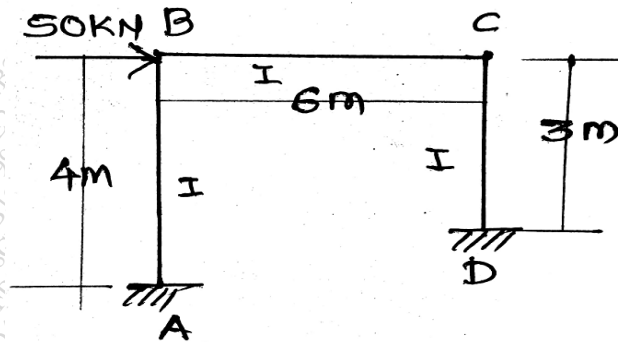

Q.3   Analyse the beam shown in fig. below by using slope deflection method draw BMD & SFD.   15
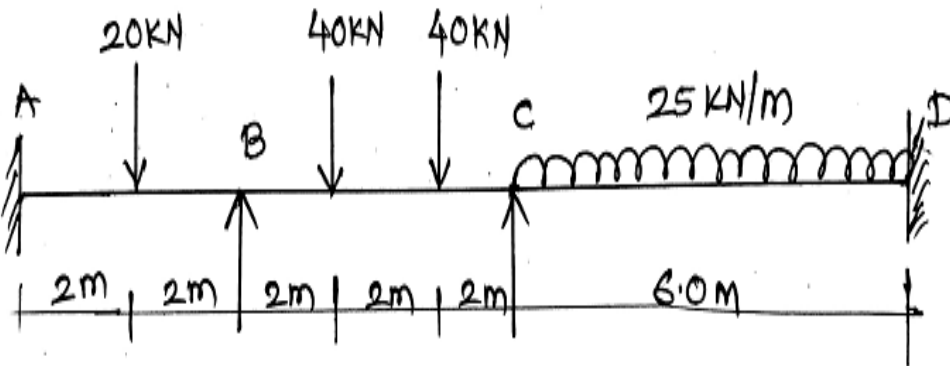
Q.4   A pin jointed truss as shown in fig below find the force in the members. Cross sectional area of   15
horizontal member is 4000 MM^2, vertical member is 3000MM^2 and diagonal member is
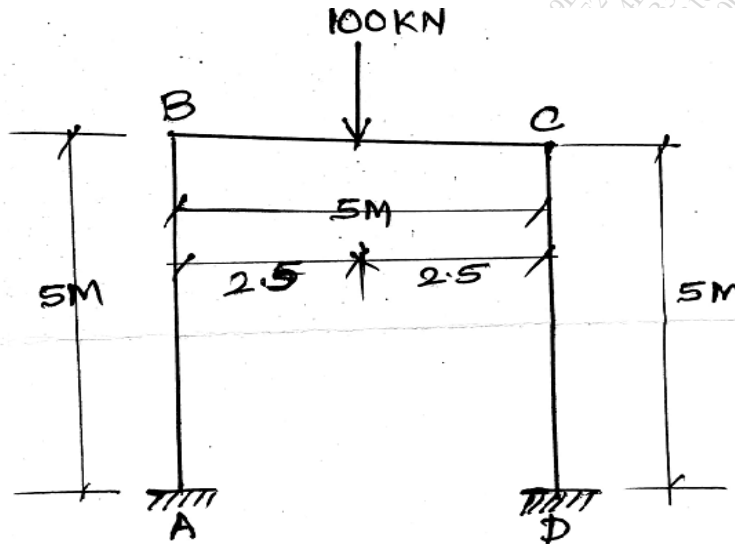5000MM^2 Take $E = 2 \times 10^5 MPa$.
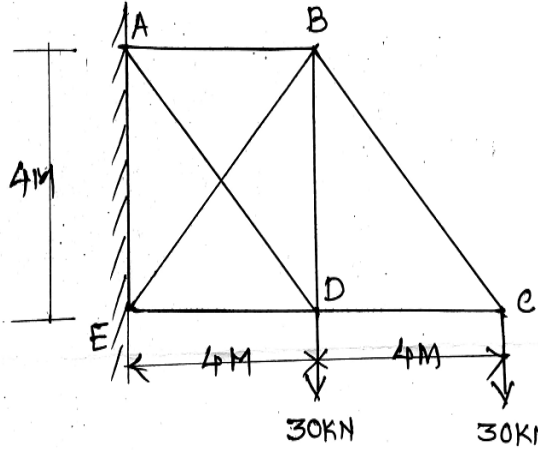
Q.5   Draw SFD, BMD for the beam shown in fig below by using SLOPE DEFLECTION METHOD.   15
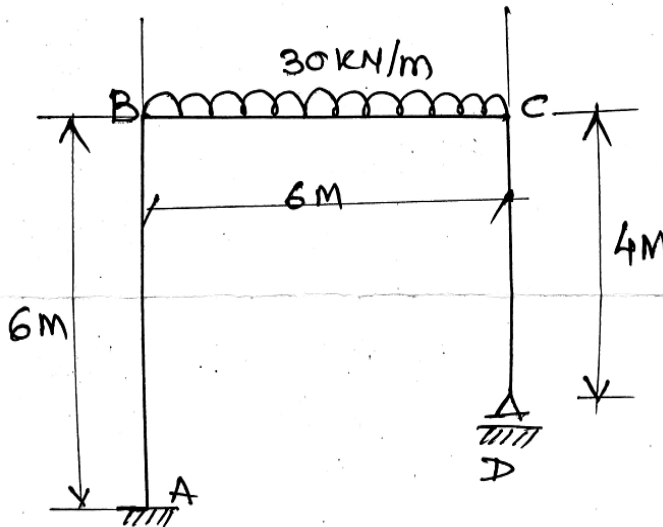if support B sinks by 2.50mm . Take $I = 3.5 \times 10^7 mm^4, E = 200KN/M^2$

418   2
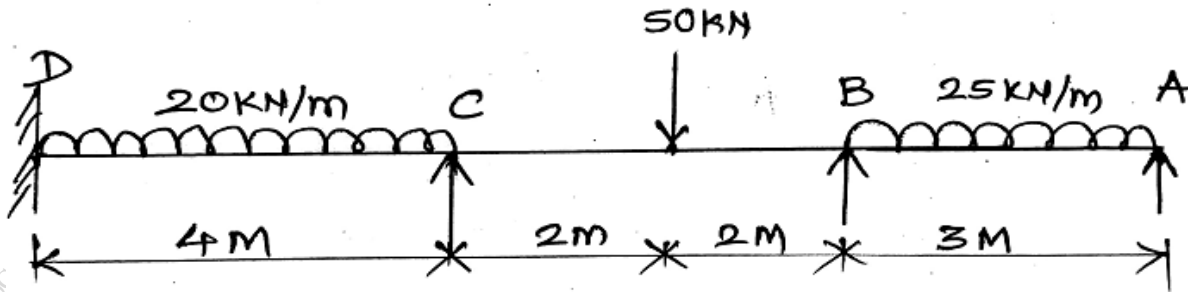
Section B

Q.6 Find the end moments of the members of the portal frame as shown in fig. by using MOMENT 10
DISTRIBUTION METHOD.

Q.7 Find the end moments of the members of the portal frame as shown in fig by using MOMENT 15
DISTRIBUTION METHOD. Draw BMD.

418 3

Q.8   Analyse the continuous beam as shown in fig by using KANI'S METHOD. If support B & C   15
sinks by 2mm and 5mm. Take $E = 200KN/M^2$, $I = 2.5 \times 10^{-5}M^4$
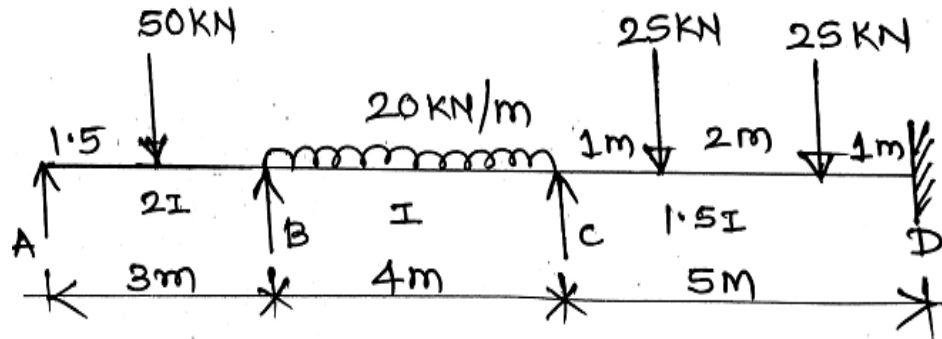
Q.9   Two hinged parabolic arch span 20M . & rise 4M. Carries UDL 50KN/M over left half span .   15
Find reactions at support and find position and value of bending moment.

Q.10   Analyse the continuous beam and draw BMD.   15
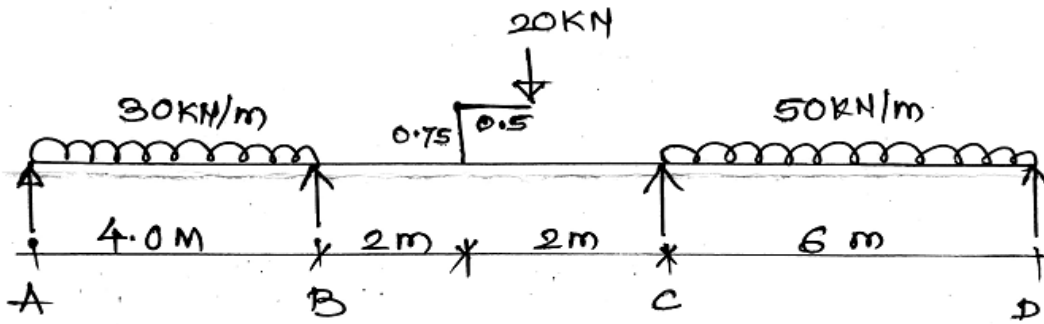
Total No. of Printed Pages:02

SUBJECT CODE NO:- H-383
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (Civil)
Transportation Engineering-I
(REVISED)

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

Please check whether you have got the right question paper.

N.B   i)**Q. No.1** and **Q.No.6** are compulsory.
             ii) Attempt any **Two** questions from remaining in each section.
             iii) Figures to the right indicate full marks.
             iv) Assume suitable data if necessity.

Section A

Q.1   Solve the following(Any five)   10
       a) State the types of bridge foundation.
       b) Define Afflux.
       c) What is mean by free board?
       d) How do you define Runway?
       e) Define Deck slab.
       f) Define linear waterway.
       g) State the types of crossing.
       h) Define Submersible Bridge.

Q.2   a) Enlist the Hydrological data to be collected for construction of a major bridge across a river.   08
       b) Define economic span? State and explain the factors on which the overall cost of bridge   07
           depends?

Q.3   a) Describe briefly the methods of estimating the flood discharge and the methods of determining   08
           the linear waterway for a bridge.
       b) What do you understand by river training? Explain the methods for river training in details.   07

Q.4   a) What are the characteristics of an ideal airport layout?   08
       b) Explain in detail the procedure of orienting the runway.   07

Q.5   Write short note on (Any three)   15
       a) Coffer dams
       b) Aprons
       c) Airport lightning and marking
       d) Wind rose diagram
       e) Pile foundation

1

383

Section B

Q.6 Solve the following(Any five)   10
    a) Define permanent way.
    b) Enlist different types of Sleepers.
    c) State fixtures and fastening.
    d) Define Wear of rails.
    e) Define Signaling.
    f) Define gauge.
    g) Packing of Ballast.
    h) Turn-out.

Q.7   a) What are the requirements of rails? Explain the advantages and disadvantages of flat footed 08
       rails.
    b) Explain in detail Equilibrium super elevation. 07

Q.8   a) Distinguish between 08
      i.   Dry Docks and Wet Docks.
      ii.   Tidal basin and Wet Basin.
    b) What is mean by crossing? State and explain types of crossing. 07

Q.9   a) What are the different gradients in station yard? Explain grade compensation. 08
    b) Classify the signal in accordance to the location and explain any one with neat sketch. 07

Q.10 Write short note on (Any three) 15

    a) Classification of Docks and harbours
    b) Diamond crossing
    c) Fish Plates and Fish Bolts
    d) Requirements of railway station
    e) Creep of Rails

Total No. of Printed Pages:2

SUBJECT CODE NO:- H-103
FACULTY OF ENGINEERING AND TECHNOLOGY
T.E. (Civil)
Environmental Engineering - I
(REVISED)

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

Please check whether you have got the right question paper.
N.B   1) Attempt any three questions from each section.
                       2) Q.1 from section A and Q.6 from Section B are compulsory.
                       3) Assume suitable data if necessary.
                       4) Draw neat and labeled diagram wherever necessary.

Section A

Q.1   a)   What are the major air pollutant in an automobile exhaust? Mention suitable control measures.   05
       b)   What do you mean by ringelmann chart? Give its working procedure.   05

Q.2   a) Define lapse rate and list out the manner which emitted plume behaviour under severe condition.   07
           Explain any one of them.
       b) Determine the effective height of stack, with following given data.   08
       1) Physical stack is 180m tall with 0.95 m inside dia.
       2) Wind velocity is 2.75 m/s.
       3) Air temp is 20°C.
       4) Barometric pressure is 1000 milibars.
       5) Stack gas velocity is 11.12m/s
       6) Stack gas temp is 160°C.

Q.3   a)   State layers of atmosphere & explain their importance with respect to air pollution.   07
       b)   Write down working principle of pipe type Electrostatic Precipitator with neat sketch.   08

Q.4   a)   With neat sketch explain i) Wind Speed recorder (ii) Wind direction recorder.   08
       b)   Write a note on effect of SPM on plants & vegetables.   07

Q.5   Write short note (any three)   15
           (a) Acid rain
           (b) Settling chamber
           (c) Wind rose
           (d) Primary & secondary air pollutants
           (e) Smog.

Section B

Q.6   a) Draw the layout plan of water purification work & describe in detail unit operation employed   05
           in it.
       b) How will you estimate the quantity of water required by a town while arranging a water supply   05
           scheme for the same.

Q.7   a) The maximum daily demand at a water purification plant has been estimated as 12MLD.   07
Design the dimensions of a suitable sedimentation tank for the raw supplies, assuming a
detention period of 6 hrs and the velocity of flow as 20 cm/min.

       b) What are impurities mostly found in natural water? Explain their effect on quality of water.   08

Q.8   a) Explain various water demands & factors affecting per capita demand.   05

       b) Which treatment would you recommend for removal of taste & odour. Discuss in brief .   05

       c) Enlist the population forecasting method & describe any two.   05

Q.9   a) Explain the principle of flocculation tank with neat sketch.   07

       b) What are the operational troubles in Rapid gravity filters.   08

Q.10 Write short note on (any three)   15
       a) Fire demand
       b) Prechlorination & post – chlorination
       c) merits & demerits of slow sand gravity filter
       d) Clariflocculator
       e) Break point chlorination.