

SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY
BE – SEMESTER-V • MID SEMESTER-I EXAMINATION – WINTER 2017
SUBJECT: HIGHWAY ENGINEERING (2150601) (CL)

DATE: 08-08-2017

TIME: 02:00 am to 03:30 pm

TOTAL MARKS:40

- Instructions:**
1. All the questions are compulsory.
 2. Figures to the right indicate full marks.
 3. Assume suitable data if required.

- Q.1 (a) 1. Which was the first committee constituted for road development in India? [05]
 2. What would be effect on the stopping sight distance with increase and decrease of speed of vehicle?
 3. What is the classification of roads given by the Nagpur Road Plan?
 4. Enlist different causes of traffic accidents.
 5. What are the different methods of parking survey?
- (b) Explain briefly about Third Twenty Year Road Development Plan of India. [05]
- Q.2 (a) Derive expression for Overtaking Sight Distance for a two lane road. [06]
- (b) Enlist the factors controlling highway alignment and explain obligatory points. [05]
- (c) Find out the stopping sight distance required if the design speed is 100kmph. Take $f=0.35$ and t (reaction time of driver) as 2.5 second. [04]
- OR
- Q.2 (a) Define terms (1) Camber (2) Skidding (3) Slipping [06]
- (b) A vehicle moving at a speed of 50kmph is to be overtaken. The design speed of road is 100kmph. Find the minimum overtaking sight distance required for a two lane road. Take reaction time of driver $t=2$ second, acceleration of vehicle $a=1m/s^2$. [05]
- (c) Derive expression for Stopping Sight Distance [04]
- Q.3 (a) Explain with sketches Speed-Flow- Density relationships of road traffic. Discuss with sketch spot-speed survey by enoscope. [06]
- (b) Enlist pavement surface characteristics and explain friction in detail. [05]
- (c) Explain the PIEV theory. [04]
- OR
- Q.3 (a) Explain the term Traffic Volume. Enumerate the different methods of carrying out traffic volume studies. What are the uses of same? [06]
- (b) Draw neatly labelled cross section of a Divided Highway in an urban area. [05]
- (c) Explain the collision diagram and condition diagram. [04]

SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY**BE - SEMESTER-V • MID SEMESTER-I EXAMINATION – WINTER 2017****SUBJECT:HYDROLOGY & WATER RESOURCES ENGINEERING (2150602) (CL)**

DATE: 04/08/2017

TIME: 2:00 PM to 3:30PM

TOTAL MARKS:40

- Q.1 (a) Short type questions of 1 mark each: [05]
- (i) Define Hydrological Cycle.
- (ii) Define direct runoff hydrograph.
- (iii) What is evapotranspiration and evaporation?
- (iv) The area under a hydrograph represents _____
- (v) What is Instantaneous Unit Hydrograph?
- (b) Define Unit hydrograph. Write its assumptions and its uses. [05]
- Q.2 (a) Thiessen polygons constructed for a network of 10 rain gauges in river basin yielded thiessen weights of 0.10, 0.16, 0.12, 0.11, 0.09, 0.08, 0.07, 0.11, 0.06 & 0.10. If the rainfalls recorded at these gauges during a cyclonic storm are 132, 114, 162, 138, 207, 156, 135, 158, 168 and 150 mm respectively determine the average depth of rainfall by thiessen mean and arithmetic mean methods. Also determine the volume of surface runoff at the basin outlet if 35% of the rainfall is lost as infiltration. Take the area of the basin as 5800 km² and express your answer in million cubic meters. [06]
- (b) Describe the methods of calculating average depth of rainfall from catchments. [05]
- (c) Clearly explain the procedure of separating base flow in a hydrograph. [04]
- OR
- Q.2 (a) In a certain river basin, There are four rain gauge stations, with their normal annual precipitation amounting to 800, 520, 450 and 390 mm, respectively. Determine the optimum number of rain gauges in the catchment if it is desired to limit the error in the mean value of rainfall the catchment to 10 % [06]
- (b) Give classification of precipitation. [05]
- (c) Explain procedure to derive S-curve hydrograph from a given unit hydrograph. [04]
- Q.3 (a) Find out the ordinates of a storm hydrograph resulting from a 9-hr storm with rainfall of 2.0 cm, 5.75 cm and 2.75 cm during subsequent 3-hr intervals. The ordinates of 3-hr unit hydrograph at 30 hr intervals are as follows. Assume an initial loss of 0.5 cm, an infiltration index of 0.25 cm/hr and a base flow of 10 cumecs. [06]

Time (hr)	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45
Ordinate of 3-hr UH cumecs	100	335	510	380	300	260	225	165	120	85	55	30	22	10	0

(b) Differentiate between the infiltration capacity and the infiltration index. Also explain the terms: (i) Φ - Index (ii) W- Index [05]

(c) Define Runoff. Write the factors affecting runoff. [04]

OR

Q.3 (a) The ordinates of flood hydrograph from a 4-hr rainfall are given in the following table. Derive ordinates of 4-Hr unit hydrograph for a catchment area of 640 km². Take constant base flow of 30 cumecs. [06]

Discharge (m ³ /s)	30	68	205	410	330	254	195	133	95	58	30	0
Time (Hr)	0	4	8	12	16	20	24	28	32	36	40	44

(b) Enlist different types of rain gauges and explain the in detail Symon's rain gauge. [05]

(c) Define the following terms: [04]

- (i) Flow duration curve
- (ii) Interception
- (iii) Interflow
- (iv) Transpiration

SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY
BE - SEMESTER- V • MID SEMESTER- I EXAMINATION – WINTER 2017
SUBJECT: ENVIRONMENTAL ENGINEERING (2150603) (CL)

DATE: 08-08-2017

TIME: 02:00pm to 03:30pm

TOTAL MARKS :40

- Instructions:**
1. All the questions are compulsory.
 2. Figures to the right indicate full marks.
 3. Assume suitable data if required.

- Q.1 (a) Answer the following questions: [05]
- (1) Define hardness.
 - (2) What are springs?
 - (3) What is lithosphere?
 - (4) What is the permissible limit of fluoride content in water supply?
 - (5) Give the definition of radial well?
- (b) Role of micro-organisms in environment. [05]
- Q.2 (a) Write a short note on control of water born diseases. [06]
- (b) Explain factors affecting rate of demand. [05]
- (c) Describe Arithmetical increase method and geometrical increase method of population forecast. [04]

OR

- Q.2 (a) Describe any two ground water sources of water with neat sketch. [06]
- (b) Explain the different physical quality parameters of water. [05]
- (c) Define pH. The measured pH values of two water samples are 7.6 and 8 respectively. Determine the average pH of water assuming linear variation of pH with time. [04]
- Q.3 (a) Draw a curve showing relationship between temperature and vertical height and explain different layers of it. [06]
- (b) Explain control measures of air pollution and gravitational settling chamber. [05]
- (c) Explain bio-medical waste characterization. [04]

OR

- Q.3 (a) Explain sources and effects of carbon dioxide, oxides of nitrogen and oxides of sulphur. [06]
- (b) Explain effects of air pollution on human health and on climate. [05]
- (c) Explain mechanical and chemical treatment of bio-medical waste. [04]

SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY

ADITYA SILVER OAK INSTITUTE OF TECHNOLOGY

BE - SEMESTER-V• MID SEMESTER-I EXAMINATION – WINTER 2017

SUBJECT: STRUCTURAL ANALYSIS-II (2150608) (CL)

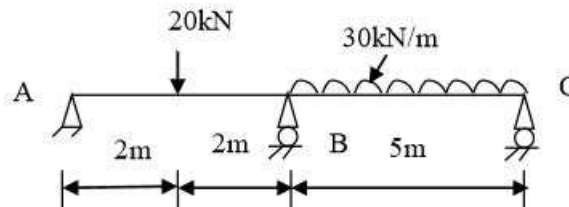
DATE: 10-08-2017

TIME:02:00pm to 03:30 pm

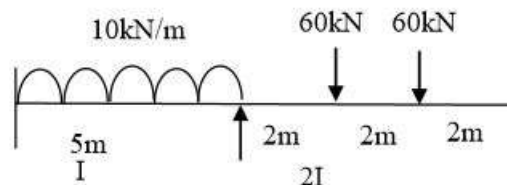
TOTAL MARKS:40

- Instructions:** 1. All the questions are compulsory.
 2. Figures to the right indicate full marks.
 3. Assume suitable data if required.

- Q.1 (a) 1) In a fixed beam of length L if right end sinks by δ , what are the moments and reactions induced at both the ends? [01]
 2) Write two characteristics of Stiffness Matrix Method [01]
 3) What is the moment at hinge end of simply supported beam? [01]
 4) In a member AB, if a moment of -10kN.m is applied at A, What is the moment carried over to B [01]
 5) Define Carry over Factor [01]
 (b) Derive Fundamental Equation for Slope Deflection Equation [05]
- Q.2 (a) Analyse the beam shown in fig. by moment distribution method. Take $EI = \text{constant}$ [06]

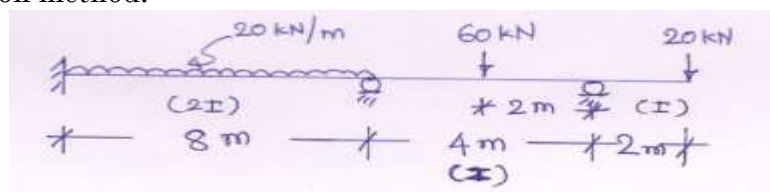


- (b) Analyse the beam shown in the figure by slope deflection equations method and draw the bending moment diagram. [09]

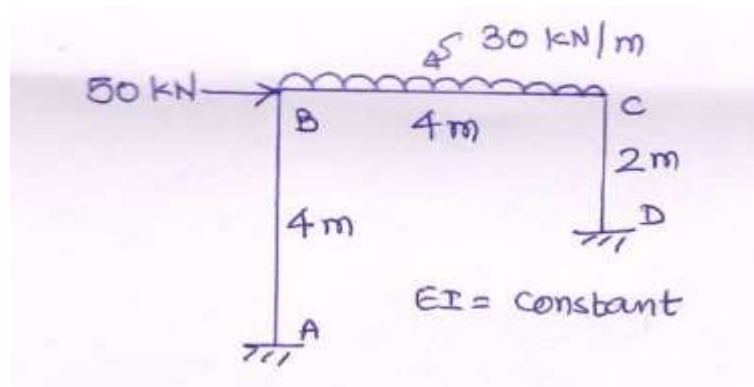


OR

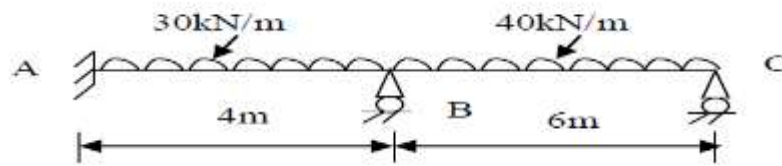
- Q.2 (a) Find out Distribution factor only for the beam shown in figure by moment distribution method. [06]



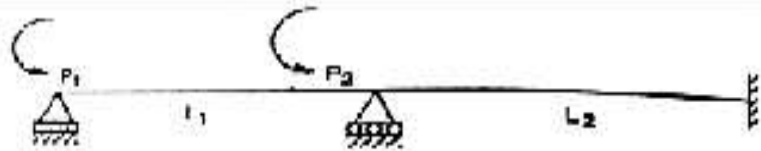
- (b) Find unknown for the portal frame shown in the figure, by using Slope Deflection Equation [09]



Q.3 (a) Analyse the beam shown in figure, by stiffness matrix method. Draw BMD only [10]
only

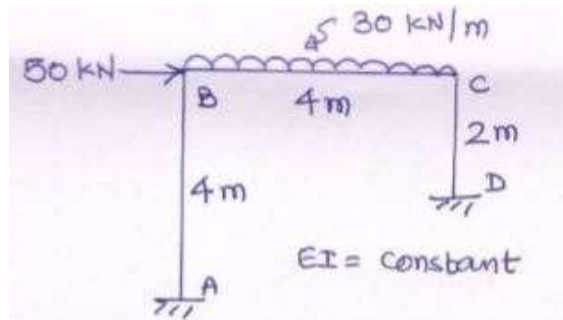


(b) Generate the Stiffness Matrix for the beam shown in fig [05]



OR

Q.3 (a) Determine the support reactions at support D of the given portal frame of figure by using Stiffness matrix method [15]



SILVER OAK COLLEGE OF ENGINEERING & TECHNOLOGY**ADITYA SILVER OAK INSTITUTE OF TECHNOLOGY****BE - SEMESTER-V • MID SEMESTER-I EXAMINATION – WINTER 2017****SUBJECT: SOIL MECHANICS (2150609) (CL)**

DATE: 11-08-2017

TIME: 2:00 pm to 3:30 pm

TOTAL MARKS:40

- Instructions:**
1. All the questions are compulsory.
 2. Figures to the right indicate full marks.
 3. Assume suitable data if required.

- Q.1 (a) Answer the following:
- (1) Height of fall of rammer for standard proctor test _____ [01]
 - (2) Define Coefficient of compressibility and Coefficient of volume change. [02]
 - (3) Explain Rotational failure and compound failure with figure [02]
- (b) What are factors affecting compaction? Discuss each. [05]

- Q.2 (a) Explain void ratio and effective stress relation for normally consolidated soil. [06]
- (b) Explain 'logarithm of time fitting' method for determination of coefficient of consolidation [05]
- (c) The maximum dry density and optimum moisture content of a soil from standard proctor test are 1.91gm/cc and 14% respectively. Compute the water content necessary to completely saturate the sample at its maximum dry density, assuming no change in volume. Take $G=2.7$ [04]

OR

- Q.2 (a) Describe the spring analogy theory for primary consolidation. [05]
- (b) Explain Terzaghi's theory of One dimensional consolidation [06]
- (c) In a consolidation test void ratio decreases from 0.70 to 0.65 when the load was changed from 50 KN/m² to 100 KN/m². Compute compression index and coefficient of volume change. [04]

- Q.3 (a) Write down step by step the Swedish slip circle method of finding the factor of safety for C- ϕ soil. [05]
- (b) Discuss about stability analysis of Infinite slopes for Cohesionless soils. Also discuss critical height about submerged slope and steady seepage along the slope. [05]
- (c) An infinite slope is made of clay with the following properties: $\gamma=18$ KN/m³, $\gamma'=9$ KN/m², $C=25$ KN/m², $\phi=28^\circ$. If the slope has inclination of 35° and height equal to 12 m, determine the stability of the slope, when [05]
- (a) The slope is submerged
 - (b) There is a seepage parallel to the slope

OR

- Q.3 (a) Calculate the factor of safety with respect to cohesion of a clay slope laid at 1:2 to a ht. of 10m, if the angle of internal friction is 10° , $C=25 \text{ KN/m}^2$, $\gamma =19 \text{ KN/m}^3$ and $S_n=0.064$. what will be the critical ht. of the slope in this soil? [02]
- (b) A slope is to be constructed in a soil for which $c=0$, $\phi= 36^\circ$. It is to be assumed that the water level may occasionally reach the surface of the slope, with seepage taking place parallel to the slope. Determine the maximum slope angle for a factor of safety of 1.5, assuming a potential failure surface parallel to the slope. What would be the factor of safety of the slope constructed at this angle, if the water table should be well below the surface? The saturated unit weight of soil is 19 KN/m^3 . [04]
- (c) Discuss about stability analysis of Infinite slopes for c - ϕ soils. Also discuss critical height about submerged slope and steady seepage along the slope. [05]
- (d) A vertical cut is made in a clay deposit having $c = 30 \text{ KN/m}^2$, $\phi= 0^\circ$, $\gamma=16 \text{ KN/m}^3$. Determine the maximum depth of cut is stable. Take $S_n=0.261$. [04]
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