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Roll No.

FOURTH SEMESTER

B.E. (CE)

MID SEMESTER EXAMINATION **MARCH 2005**

CE-211 SOIL MECHANICS

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer **ALL** questions.
Use SI units only.
All parts of a question must be attempted at one place in sequence of its appearance.
Assume suitable missing data, if any.

- 1 Assuming soil to be a three phase system establish following relationship

$$w = S_r \left[\frac{\gamma_w}{\gamma_a} - \frac{1}{G_s} \right] \times 100\%$$

where all the term have usual meanings. (2)

- 2 Check the validity of following statements and substantiate your reply with suitable reasons

- [a] 5% air voids and 95% degree of saturation may correspond to same state of density in soils.
- [b] Capillarity in soils may induce stressed state on the ground surface.
- [c] In sand replacement method, an uniformly graded sand is normally used.
- [d] Permeability of clays is normally lower than sandy soils despite of higher void ratio. (4)

- 3 Fill in the blanks

- [a] Coarse sand sizes amongandmm.
- [b] Maximum, and minimum void ratio for equal spherical particles shall beand.....

[c] Time taken for the fall of a single silt sized particle through a 30 cm column of water is estimated to be equal toseconds.

[d] Capillary rise in silty clay may be as high asm.

(4)

4[a] Describe briefly the factors affecting permeability of the soils.

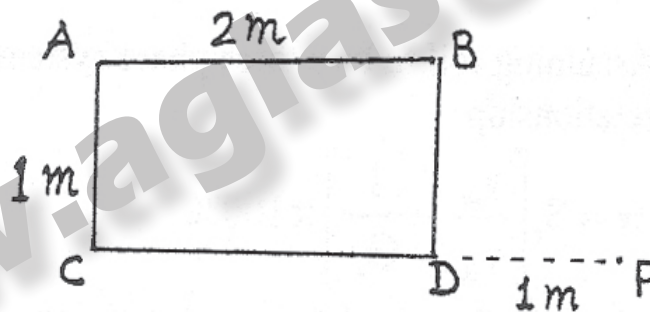
(2)

[b] Draw self explaining figures for estimation of small scale field permeability of the soils.

(2)

5 Find the intensity of pressure 2 m vertically below point p if the intensity of pressure on the plate ABCD is 200 kPa.

(4)



6 Show engineering application of Laplace equation with special reference of two dimensional flow, heat transfer and flow of current in conducting media.

(2)

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MID SEMESTER EXAMINATION **MARCH 2005**

CE-212 ELECTRICAL TECHNOLOGY

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer **ALL** questions.
All questions carry equal marks.
Symbol and notations have their usual meanings.
Assume suitable missing data, if any.

- 1 A circuit is composed of a resistance of 6Ω and a series connected capacitive reactance of 8Ω . A voltage $e(t) = 141\sin 377t$ is applied to the circuit. Find the
- [a] value of complex impedance
 - [b] instantaneous and effective values of current
 - [c] power delivered to the circuit.
- 2 In the circuit of Fig.1 find the current delivered by the battery using transformations. All resistances are given in ohms.

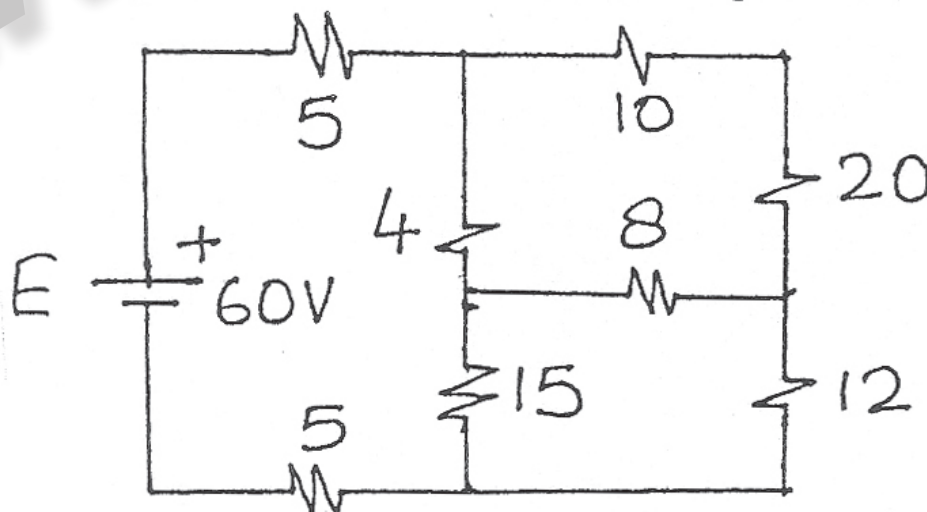


FIG.1.

- 3 Using Thevenin's theorem find the current flowing through \bar{Z}_3 branch of the circuit shown in Fig.2

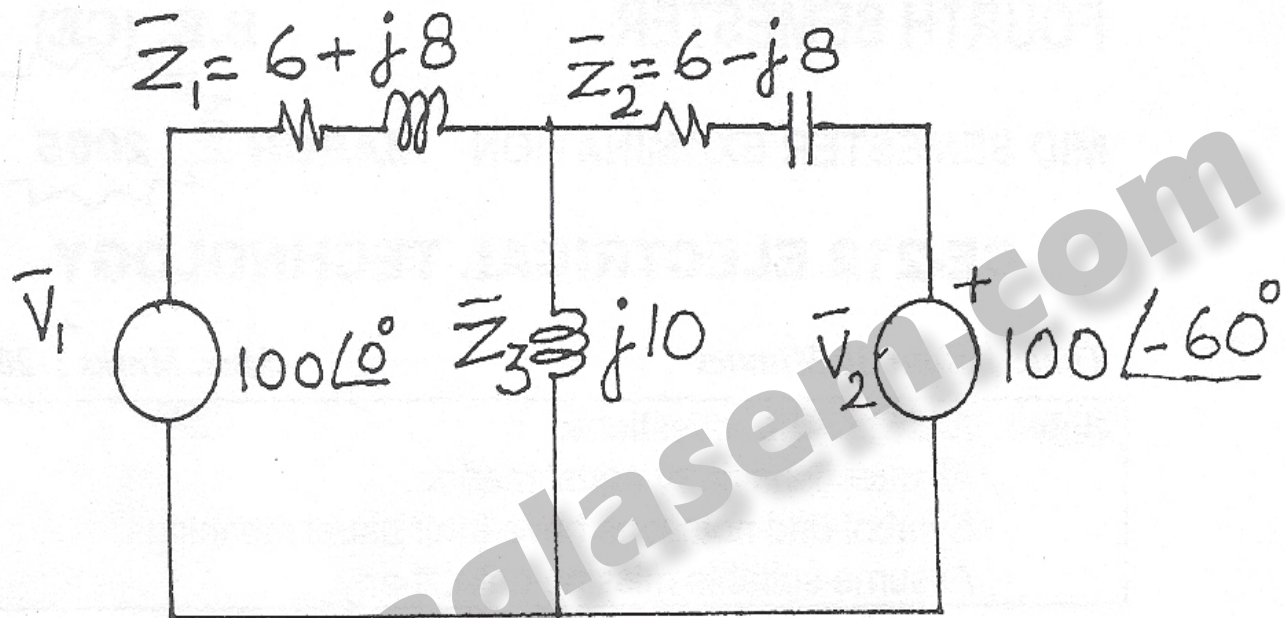


FIG.2.

- 4 A sinusoidal voltage is applied to three parallel branches. Two of the branch currents are $i_1 = 14.14 \sin(\omega t - 37^\circ)$, $i_2 = 28.28 \cos(\omega t - 143^\circ)$. The source current is $i_1 = 63.8 \sin(\omega t + 12.8^\circ)$. Obtain the complete time expression for current in third branch using phasor addition.

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FOURTH SEMESTER

B.E. (CE)

MID SEMESTER EXAMINATION **MARCH 2005**

CE-213 BUILDING MATERIALS & CONSTRUCTION

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Use separate Answer sheets for Part-A & Part-B
Answer any **TWO** questions from Part-A & **ALL** from
Part-B.
Assume suitable missing data, if any.

PART-A

1. What is an adhesive? Give a brief account of different types of adhesives. (5)
2. Write the important characteristics of a good paint. What are the different ingredients of a paint and explain their functions. (5)
3. Write short notes on any **TWO** of the followings :
[a] Abrasives [b] Explosives
[c] Cordite [d] Composites. (5)

PART-B

1. Explain the difference between Raft foundation and pile foundation with neat sketches. (3)
2. State the conditions under which following types of staircases are adopted with sketches
(i) Dog legged Staircase (ii) Straight staircase (3)

- 3 What are the various causes of dampness in buildings? How would you treat dampness through foundations on bad soil. (2)
- 4 What are the main points of differences between English bond and Dutch Bond. Draw neat sketch of each. (2)

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FOURTH SEMESTER

B.E. (CE)

MID SEMESTER EXAMINATION **MARCH 2005**

CE-214 SURVEYING-I

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Question No. 1 is compulsory
Answer any **ONE** from the remaining.
Assume suitable missing data, if any.

- 1[a] Differentiate between true error and Discrepancy.
- [b] What is the magnitude of standard Pull and temperature in testing of 30 m chain? What is permissible error in it?
- [c] Principles of working of site square and their use.
- [d] What is principle of surveying "working from whole to part"?
- [e] Differentiate between agonic line and aclinic line.
- [f] If bearing of sun at place is 176° at noon. What will be its declination and direction?
- [g] Differentiate between horizontal plane and level surface.
- [h] When you will prefer tacheometric contouring and square contouring
- [i] A captain of ship of height 1.5 m standing at the deck of ship just sees a light house which is 42 m above the sea level and height of captain's eye is 6 m above sea level. Find the distance of the captain from the light house.
- [j] A 20 m chain was found to be 20 cm too long after chaining a distance of 1500 m. It was found to be correct before the commencement of work. Find true distance.

(1x10)

2[a] A close traverse has the following bearings :

Line	Forward Bearing	Backward Bearing
AB	32°	212°
BC	77°	262°
CD	112°	287°
DE	122°	302°
EA	265°	85°

At which station do you suspect local attraction? Find correct bearings of lines. What will be the true fore bearing (as reduced bearing) of lines, if the magnetic declination was 12°W? (7)

[b] Enumerate the difference between surveyor compass and Prismatic compass. (3)

3[a] The following notes refer to the reciprocal levels taken with one level:

Instrument Station	Staff reading on	
	A	B
A	1.030	1.630
B	0.950	1.540

Distance between AB = 1000m and R.L of A = 100 m. Find true R.L of B. (4)

[b] The field level book readings from a fly level are as follows :

Staff Station	R.L	B.S	F.S
BM-1	100	3.635	--
A	X	X	2.375
B	104.150	4.220	1.030
C	106.650	3.990	X
B.M-2	108.000	--	X

Find out the missing value marked (X) and perform the arithmetic check (S). (6)

FOURTH SEMESTER

B.E. (CE)

MID SEMESTER EXAMINATION **MARCH 2005**

CE-215 DESIGN OF STRUCTURAL ELEMENTS

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer *ALL* questions.
Use of IS 456-1978/2000 is permitted.
Assume suitable missing data, if any.

- 1 Reinforced concrete beams of overall dimensions 300 mm x 500 mm rest on brick walls 300 mm thick. Beams have a clear span of 5 m and are spaced at 3.5 m c/c. Thickness of the slab supported by the beams is 120 mm. Live load on the slab is 2 kN/m², and the floor finish weighs 0.6 kN/m². Using M20 concrete and Fe250 mild steel bars, design the reinforcement required for flexure in one of the intermediate beams. The effective cover to the centre of reinforcement is 50 mm. (7)
- 2 A rectangular reinforce concrete beam simply supported at ends over an effective span of 5 m, carries a uniformly distributed load of 20 kN/m including its own weight. Design the beam section using M20 concrete and Fe415 steel. The size of the beam is restricted to 400 mm x 400 mm overall. Decide the cover to reinforcement if the beam is subjected to saline atmosphere. (6)
- 3 Design a reinforced concrete slab 2 m x 3 m, simply supported on all the four sides. It carries a live load of 4 kN/m² in addition to its dead weight. Use M20 concrete and Fe 415 steel. (7)