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Roll No.

FOURTH SEMESTER

B.E. (BT)

MID SEM EXAMINATION

March

2007

BT-211 MOLECULAR BIOLOGY

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer ALL questions.

Assume suitable missing data, if any.

1 Answer any FOUR parts:

- [a] Explain in detail the Meselson and Stahl experiment.
- [b] State all the differences between a prokaryotic and a eukaryotic replication system.
- [c] Explain the duplication of linear replicons with emphasis on telomeres.
- [d] Describe two different mechanisms of replication involving a single strand as a template.
- [e] Explain the mechanisms by which the nucleic acid of an adenovirus multiply.

3x4

2 Describe ONE of the following enzyme families

- (i) DNA Topoisomerases
- (ii) DNA Polymerases

3

3 Explain in detail any TWO of the following

- (i) Types of DNA damages
- (ii) Mismatch Repair
- (iii) Ames test.

2.5x2

FOURTH SEMESTER**B.E. (CE)****MID SEM EXAMINATION****March****2007****CE-211 SOIL MECHANICS****Time: 1 Hour 30 Minutes****Max. Marks : 20**

Note : Answer **ALL** the questions in order of their appearance only.
Use SI units only.
Assume suitable missing data, if any.

1 Check the validity of the statements and explain giving suitable reasons:

[a] Maximum and minimum void ratios of a soil have always constant values. **6x1**

[b] If a rock mass is powdered to a finer state of particulate media having sizes less than 0.002μ , its engineering behaviour shall be similar to clayey soils.

[c]
$$D(mm) = K \sqrt{\frac{L(mm)}{t(min)}}$$

if the terms have their usual measuring K is directly proportional to temperature.

[d] It is it possible to have a water content of 15 to 30% in loose to dense uniform sand in saturated state.

[e] The cone method for determination of liquid limit is more appropriate for soils of high liquid limit.

[f] In spite of a higher void ratio, clays have lower permeability than sands.

2 Briefly explain the following with suitable figure. **3x2**

[a] Compaction plots for sandy and clayey soils.

[b] A-line and U-line on plasticity chart.

[c] Plane stress and plane strain tests.

3[a] Draw a Newmark's chart for Boussinesq's equation.

[b] Find pressure intensity for a circular rigid plate of one meter diameter at an edge point at a depth of one meter. The circular plate has been loaded uniformly with 10000 kN. **2x4**

MID SEM EXAMINATION

March

2007

CE-212 ELECTRICAL TECHNOLOGY

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer ALL questions.
Symbols & notations have their usual meanings.
Assume suitable missing data, if any.

- 1 When a sinusoidal voltage is applied to three parallel branches, the resulting branch currents are as follows

$$i_1 = 14.14 \sin(\omega t - 45^\circ),$$

$$i_2 = 28.28 \cos(\omega t - 60^\circ),$$

$$i_3 = 7.07 \sin(\omega t + 60^\circ),$$

Find the complete time expression for source current using phasor addition.

5

- 2 A circuit is composed of a resistance of 6Ω and a series connected capacitive reactance of 8Ω . A voltage $e(t) = 141 \sin 377t$ volts is applied to the circuit

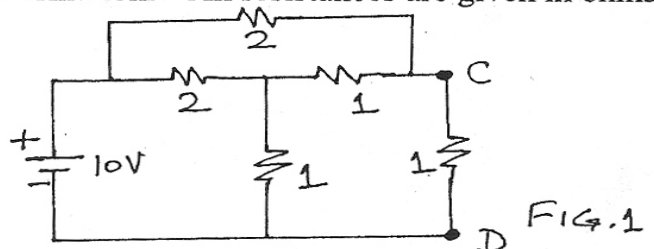
Find

- the value of complex impedance
- time expression for the current
- value of capacitance in farads
- power delivered to the circuit
- power factor.

5

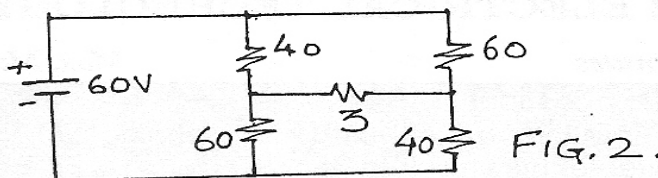
- 3 In the circuit of Fig.1 calculate the current flowing through branch CD using transformations. All resistances are given in ohms.

5



- 4 Using Thevenin's theorem find the power delivered to 3Ω resistance in Fig.2. All resistances are given in ohms.

5



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Roll No.

FOURTH SEMESTER

B.E. (CE)

MID SEM EXAMINATION

March

2007

CE-213 BUILDING MATERIAL & CONSTRUCTION

Time: 1 Hour 30 Minutes

Max. Marks : 20

Note : Answer **ALL** questions from Part-B and any **TWO** from Part-A.

Use separate answer sheets for Part-A and Part-B.

Assume suitable missing data, if any.

Part-A

- 1 What are Adhesives? Write the mechanism of adhesive action. What are the advantages and disadvantages of adhesives? 5
- 2 What are the important characteristics of a good paint? Write the different ingredients of a paint and explain their functions. 5
- 3 What are insulators? How are they classified? Give examples of each class and write their applications. 5
- 4 Write short notes on any **TWO** of the following;
 - i Abrasives
 - ii Explosives
 - iii Composites
 - iv Cordite 5

Part-B

- 1 What are the advantages and disadvantages of
 - (i) Shallow foundation
 - (ii) Deep foundations 2.5
- OR**
- 2 Name the different types of foundations you recommend under different situations and the soil. Explain them briefly? 2.5

- 3 Enumerate the problems of Rural Housing, Fire resistance construction. 2.5

OR

- 4 Differentiate between the following
- [a] Sound proofing and Accoustics
 - [b] Natural and Artificial ventilation 2.5

- 5 Calculate by using Hiley's formula for the ultimate load carrying capacity of R.C.C. pile. Given the following data:

Section of pile = 500 mm x 500 mm

Length of pile = 15 m

Weight of Concrete = 2.4 tonnes/m³

Weight of falling mass = 5 tonnes

Height of free fall = 1 m

Average penetration under last 10 blows = 5 mm

Efficiency of hammer = 100 percent

Coefficient of hammer = 0.5

Total elastic compression = 30 mm

What will be the maximum ultimate load carrying capacity of pile? 5

OR

An assembly cultural activity hall having rectangular shape, its dimensions are 30 m x 20 m x 8 m. The areas of different surface used are (i) cement plaster 100m² (i) concrete floor 600 m² (iii) Celotex ceiling = 600 m² and (iv) light curtain = 100 m². The capacity of such a hall is of 900 wooden seats. Assume 2/3 of the audience to be present and work out the following.

- [a] Number of absorbing units and time of reverberation.
- [b] Number of extra absorbing unit required so as to get an optimum reverberation time of 1.2 seconds.
- [c] Co-efficient of absorbing material of area for fixing material is 680 m².

5

FOURTH SEMESTER**B.E. (CE)****MID SEM EXAMINATION****March-2007****CE-214 SURVEYING-I****Time: 1 Hour 30 Minutes****Max. Marks : 20****Note : Answer ALL questions.****Assume suitable missing data, if any.**

- 1[a] What are different tape corrections? Describe them? Explain the reasoning behind the sign + or -? **2**
- [b] A tape is 30 m at a standard tension of 100 N, and its cross section is 6.0 mm × 0.2 mm. If the applied tension is 80 N, and $E = 1.95 \text{ N} \times 10^5 \text{ N/mm}^2$, calculate the correction. **2**
- [c] Draw the sketches of various conventional symbols used in the plotting of a chain survey work. **1**
- [d] A and B are two points 200 m apart on right bank of a river flowing east to west. A tree on the left bank is observed from A and B, and the bearings of the tree are 20° and 330° , respectively, as measured clockwise with respect to the north. Find the width of the river. **3**
- [e] Draw comparison of a surveyor's compass and a prismatic compass. **2**
- 2[a] Differentiate between **2**
- True meridian and Magnetic meridian
 - Declination and Dip
 - Whole circle bearing and Quadrantal bearing
 - Fore bearing and Back bearing
- [b] Find the magnetic declination if the magnetic bearing of the sun at noon is **2**
- 185°
 - 358°
- [c] A closed compass traverse ABCD was conducted round a lake and the following bearings were obtained. Determine which of the stations are suffering from local attraction and give the values of the corrected bearings. **4**

Line	FB	BB
AB	$74^\circ 20'$	$256^\circ 0'$
BC	$107^\circ 20'$	$286^\circ 20'$
CD	$224^\circ 50'$	$44^\circ 50'$
DE	$306^\circ 40'$	$126^\circ 0'$

- [d] What do you understand by 'closing error' of a compass traverse? Show it can be adjusted by graphical method. **2**

FOURTH SEMESTER**B.E. (CE)****MID SEM EXAMINATION****March 2007****CE-215 DESIGN OF STRUCTURAL ELEMENTS****Time: 1 Hour 30 Minutes****Max. Marks : 20****Note :** Answer **ALL** questions.

Use of IS: 456 is permissible.

Assume suitable missing data, if any.

- 1 What are various types of cement? How they differ in chemical composition and where you will recommend them for use? **4**

- 2 Sieve analysis results of an aggregate are as follows:

I.S. Sieve Designation	Percentage passing
20 mm	100
10 mm	49
4.75 mm	01

Find out fineness modulus of above aggregate?

4

- 3 What precautions will you take in using different type of mortars? **4**

- 4 Sieve analysis results of fine and coarse aggregates and desired grading are as follows :

I.S. Sieve designation	Percentage passing		
	F.A.	C.A.	Desired grading
40 mm	100	100	100
20 mm	100	98	100
10mm	100	43	65
4.75 mm	96	03	42

2.36 mm	89	0	35
1.18 mm	73	0	28
600 μ m	48	0	20
300 μ m	20	0	7
150 μ m	02	0	0

Find out ratio of fine aggregate to coarse aggregate and combined grading? **4**

- 5 Decide a beam section and amount of reinforcement for M20 grade concrete and Fe415 steel to resist a design bending moment of 150 kNm. Also provide checks. **4**