Code No. 5210

FACULTY OF ENGINEERING

B.E. 4/4 (Civil) I - Semester (Main) Examination, December 2015

Subject : Foundation Engineering

Time : 3 Hours **Max. Marks: 75**

Note: Answer all questions from Part - A and answer any five questions from Part-B.

PART – A (25 Marks)

1 Sketch contact pressure distribution under a rigid footing in sand and clay medium. (2)
2 Why is it necessary to proportionate footings? (2)
3 Define negative skin friction and mention the measures to negate it. (2)
4 When are pneumatic caissons preferred? (2)
5 How are samples stored after extraction, before being tested? (2)
6 Determine the vertical stress under the centre of a rectangular area 8m x 6m at 9m depth, if the stress under the corner of a 4mx3m area at the same depth is 8KN.m^2. (3)
7 The number of blows required for a penetration of each 150 mm in a bore hole under water was 25, 24, 23 respectively. Determine the SPT value (N value). What is the corrected value if the over burden pressure was 330 kN/m^2 and the soil is silty. (3)
8 What are the advantages of cyclic pile load test? (3)
9 Sketch a diaphragm type cellular coffer dam indicating all the component parts. (3)
10 One sampler has an area ratio of 8% and the other has 18%. Which of them is preferred and why? (3)

PART – B (50 Marks)

11 (a) Explain step by step construction procedure to develop a Newmark's chart. What are the advantages of the same? (5)
(b) A raft of size 4m x 4m carries a uniform load of 200kN/m^2. Using the point load approximation formulae, calculate the stress increment at a point which is 4m below the centre of the loaded area. (5)

12 (a) What are the assumptions made in Terzaghi's Bearing capacity theory and discuss how does the formula vary from the IS code method. (5)
(b) A column carries a load of 1000kN. The soil is sand having an angle of internal friction of 40^o. A minimum factor of safety of 2.5 is required and Terzaghi's factors are N_γ = 42 and N_q = 21. Find the size of a square footing required, if it is placed at 1m below the ground level with water table at ground surface. Assume Y_{sat}= 21 KN/m^3. (5)

13 (a) Explain cyclic pile load test and the procedure to separate skin friction from end bearing resistance. (5)
(b) A precast pile is driven with a 30kN drop hammer with a free fall of 1.5m. The average penetration recorded in the last few blows is 5mm per blow. Estimate the allowable load on the pile using Engineering News formula. (5)

14 Write a detailed note on (a) Open and (b) Box caissons with neat sketches, highlighting the differences in construction, sinking and uses. (10)

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15 (a) With a neat sketch, explain raking method of bracing for shallow foundations. (5)
(b) What are the different boring methods to obtain soil samples, discuss? (5)

16 (a) Discuss different dewatering techniques. (5)
(b) Write a detailed note on Plate load test. (5)

17 Write short notes on the following: (10)
(a) Permissible settlement values as per IS code
(b) Calculation of reaction in struts
(c) Pile group efficiency
(d) Bore log

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Code No. 5220

FACULTY OF ENGINEERING

B.E. 4/4 (EEE) I – Semester (Main) Examination, December 2015

Subject: Electric Drives and Static Control

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

1	Draw the speed torque characteristics of a DC shunt motor under armature voltage control and field control.	3
2	Explain with a figure about multiquadrant operation of drives.	3
3	Draw a four quadrant characteristic of an induction motor for counter current braking operation.	3
4	Which is the worst form of electric braking, from the energy point of view?	2
5	If a dc drive is under discontinuous conduction operation how can you make it operate under continuous conduction mode?	2
6	Give the salient features of circulating and non-circulating types of dual converter.	3
7	Draw the speed-torque characteristics when induction motor is controlled by AC voltage controller. Briefly explain.	3
8	How do you obtain variable voltage in a voltage source inverter?	2
9	Why sensors are required for brushless DC motors?	2
10	Why brushless DC motor is more efficient than conventional DC motor? What are its salient features?	2

PART – B (5x10 = 50 Marks)

11	Derive the condition for stability of motor-load system from fundamentals.	10
12	Derive the expression for moment of inertia for load equalization.	10
13	A 200 V, 875 rpm, 150A separately excited dc motor has an armature resistance of 0.06Ω. It is fed from a single phase fully controlled rectifier with an ac source voltage of 220 V, 50 Hz. Assume continuous conduction, calculate i) Firing angle for rated motor torque and 750 rpm ii) Firing angle for rated motor torque and – 500 rpm.	10
14	Explain V/f control of induction motor with equation and relevant characteristics.	10
15	What do you mean by slip power recovery scheme? What are its advantages? Discuss in detail about static scherbius drive.	10
16	Explain regenerative braking and dynamic braking of separately excited motor with a suitable chopper circuit.	10
17	Write short notes on: a) Transient stability of electric drive b) Static rotor resistance control.	5 5

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Code No. 5237

FACULTY OF ENGINEERING

B.E. 4/4 (ECE) I - Semester (Main) Examination, December 2015

Subject : Mobile Cellular Communications

Time : 3 hours **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1 If a total of 33 MHz of BW is allocated to a particular FDD cellular system which uses two 25 KHz simplex channels to provide full duplex voice channels. Compute total number of channels available per cell if a system uses four-cell reuse. 3

2 Define Grade-of-service. 2

3 If a transmitter produces 10W of power with a 950 MHz carrier frequency, find the received power at a free space distance of 1 KM from the antenna [Assume $G_t = G_r = L = 1$]. 3

4 Explain the signal penetration into the buildings. 2

5 IF US AMPS cellular operator is allocated total BW of 25 MHz for each simplex band, guard band is 10 KHz and channel BW is 30 KHz. Find the number of channels in an FDMA system. 3

6 Briefly explain PRMA. 2

7 Explain GSM operations from speech input to speech output. 3

8 What do you mean by block interleaving? 2

9 Write short notes on WLAN. 3

10 Differentiate features of W-CDMA and cdmaone. 2

PART – B (50 Marks)

11 a) Prove that for a seven cell cluster, the S/I ratio is not less than 18 dB for a satisfactory performance, where S is signal power and I is co-channel interference power. 5

b) Explain various channel assignment strategies. 5

12 a) Explain the diffraction mechanism for propagation of EM waves in a cellular system. 5

b) Explain Log-normal shadowing method for link budget design. 5

13 a) Explain the time dispersion parameters of mobile multipath channels. 5

b) If a normal GSM time slot consists of 6 trailing bits, 8 guard bits, 26 training bits and two traffic bursts of 58 bits of data, find frame efficiency. 5

14 Explain the difference between pure ALOHA and slotted ALOHA. Prove that the slotted ALOHA provides maximum channel utilization. 10

15 a) Explain GSM system architecture and its various interfaces. 5

b) Explain CDMA reverse channel modulation process for a single user with a neat block diagram. 5

16 a) Explain Longley-Rice model for outdoor propagation model. 6

b) Differentiate hard handoff and soft handoff 4

17 Write short notes on any two of the following :

i) FDMA ii) Partition losses iii) Bluetooth 3+4+3

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Code No. 5262

FACULTY OF ENGINEERING

B.E. 4/4 (AE) I – Semester (Main) Examination, December 2015

Subject: Vehicle Maintenance

Time: 3 Hours **Max.Marks: 75**

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

1 Distinguish between preventive and breakdown maintenance.
2 What is the main objective of maintenance?
3 What is meant by engine tune up?
4 What is a circlip? How can it be removed and fixed?
5 Define clutch drag and clutch slip.
6 Name the basic troubles of the brake system.
7 What are the different methods of tests on batteries?
8 What are the probable causes for non-function of an electric horn of a car?
9 What is meant by pumping of oil?
10 List the body repair tools.

PART – B (5x10 = 50 Marks)

11 Explain various types of records, books and forms that are being used in an automobile service station of cars. 10

12 Write the step by step procedure of overhauling a multi-cylinder petrol engine. 10

13 a) What is meant by bleeding of hydraulic brakes? How it is done? 5
b) What are the reasons for gear slipping? 5

14 Explain the different methods used for wheel balance. Describe the two methods used to repair a tubeless tyre. 10

15 Describe the servicing technique and fine tuning of the contact breaker cum distributor assembly of an engine. 10

16 a) What are the possible causes and remedy for engine overheating due to cooling system? 5
b) Give a brief account of servicing of oil and fuel filter. 5

17 Write short notes on the following:
a) Body panel repair procedure 4
b) Door locks mechanism 3
c) Lubrication system troubles. 3

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Code No. 5271

FACULTY OF INFORMATICS

B.E. 4/4 (CSE /IT) I - Semester (Main) Examination, December 2015

Subject : Information Security

Time : 3 hours **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1	What are the components of an Information system?	3
2	How to balance information security and its accessibility?	2
3	What are the different types of laws?	2
4	Differentiate between IRP, DRP and BCP.	3
5	Define : Firewall and DMZ	2
6	Write brief note on proxy server.	3
7	Differentiate between digital certificates and digital signatures.	2
8	What is public key encryption?	3
9	Differentiate between certification and accreditation.	2
10	List out the various employment policies and practices.	3

PART – B (5 10 = 50 Marks)

11	Explain the various stages involved in sec SDLC in detail.	10
12	Explain the process of Risk identification in detail.	10
13	a) Explain the various firewall architectures.	6
	b) Write about securing authentication with Kerberos.	4
14	a) Write about symmetric encryption.	3
	b) Explain RSA algorithm with an example.	7
15	Explain the security maintenance model.	10
16	a) Discuss about how to select a risk control strategy in detail.	6
	b) Write about RADIUS and TACACS.	4
17	Write short notes on the following :	
	a) ACLS	3
	b) DES	4
	c) IDPS	3

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