Code No. 11082

FACULTY OF ENGINEERING

B.E. 3/4 (Civil) I-Semester (Backlog) Examination, November / December 2018

Subject : Reinforced Cement Concrete

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	Explain ultimate load method and limit state method.	3
2	Draw the stress strain curve for mild steel and explain the same.	3
3	Differentiate between working stress method and limit state method.	2
4	Explain what is development length.	2
5	Give any three assumptions made in limit state of collapse.	3
6	Give the IS specifications required for the torsion design.	2
7	Explain the deflection criteria's in the design of slabs and beams.	2
8	Define one way slab.	2
9	Give any three assumptions made in yield line theory.	3
10	Differentiate uni-axial and bi-axial bendings.	3

PART – B (50 Marks)

11 a) Explain mechanical properties of concrete. 5

b) Discuss about various parameters that may influence properties of hardened concrete. 5

12 A reinforced concrete beam 200mm x 400mm effective depth is used over an effective span of 5m. It is subjected to a uniformly distributed load of 7 kN/m inclusive of its own weight. Find the necessary steel reinforcement at the centre of the span. Take the allowable steel and concrete as 130N/mm^2 and 4N/mm respectively and m = 14. Use working stress method. 10

13 Design a rectangular beam of 6m effective span which is subjected to dead load of 13 kN/m and live load of 14 kN/m. Use M20 grade concrete and fe500 grade steel. 10

14 An RC beam has an effective depth of 400mm and breadth of 300mm. It contains 3-25mm fe500 grade of steel in tension. Determine the steel reinforcement needed for a factored shear force of 250kN if i) Mix is M20 and ii) if Mix is M30. 10

15 Design a two way slab for a room 6m x 5m clear in size if the super imposed load is 6 kN/m^2 concrete. Use M20 grade concrete and fe500 grade steel. Use limit state method. 10

16 Design a short column, square in section to carry an axial load of 2500 kN using M25 grade concrete and fe500 grade steel. 10

17 Design a footing for a rectangular column 300mm x 450mm carrying an axial service load of 1000kN. The net bearing capacity of the soil is 180kN/m^2. Use M25 grade concrete and fe500 grade steel. 10

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Code No. 11088

FACULTY OF ENGINEERING

B.E. 3/4 (EEE) I – Semester (Backlog) Examination, November / December 2018

Subject: Power Systems – II

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

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

PART – A (25 Marks)

1 Explain what you mean by loadability of overhead lines and discuss loadability characteristic of these lines. 3 M

2 List out the advantages and disadvantages of corona. 2 M

3 Explain the working principle of thyristor switched capacitor. 2 M

4 Show that the approx per unit change in voltage equals the ratio of change in reactive power to the short circuit capacity of the bus. 3 M

5 Draw the vector diagram with the help of sequence components to obtain the phase voltages. 2 M

6 Two generating stations having short circuit capacities of 1500 MVA and 1000 MVA respectively and operating at 11 kV are linked by an interconnected cable having a reactance of 0.6 ohm per phase, determine the short circuit capacity of each station. 3 M

7 The line-to-ground voltages on the high voltage side of a step-up transformer are 100 kV, 33 kV and 38 kV on phases a, b and c respectively. The voltage of phase a leads that of phase b by 100° and lags that of phase c by 176.5°. Determine negative sequence of the voltage. 3 M

8 Draw the connections of sequence networks for line to ground fault through an impedance which is the parallel combination of Z_i and Z_p. 2 M

9 What is a travelling wave? Draw the characteristics of it. 2 M

10 Explain why a travelling wave suffers reflection when it reaches a discontinuity and terminated with different line parameters? 3 M

PART – B (5x10 = 50 Marks)

11 a) Determine the sending end voltage current, power and power factor for a 150 km section of 3-phase line delivering 60 MVA at 132 kV and p.f. 0.8 lagging. Also find the efficiency and regulation of the line. Resistance per line 0.1568 ohm per km, spacing 3.7 m, 6.475 m, 7.4 m transposed. Evaluate the A, B, C, D parameters also. Diameter 1.95 cm. 5 M

b) A 3-phase, 50 Hz, 132 kV transmission line consists of conductors of 1.17 cm dia and paced equilaterally at a distance of 3 metres. The line conductors have smooth surface with value for m = 0.96. The barometric pressure is 72 cm of Hg and temperature of 20°C. Determine the fair and foul weather corona loss per km per phase. 5 M

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12 a) Explain with neat diagrams the operation of a basic TCR and derive expression for the control law of the basic TCR and explain the control law. 5 M

b) A 3-phase line has an impedance of (20 + j60) ohm per phase. The sending end voltage is142 kV while the receiving end voltage is maintained at 132 kV for all loads by an automatic phase modifier. If the kV Ar of the modifier has the same value for zero load as for a load of 50 MW, determine the rating of the modifier and the p.f. of this load. 5 M

13 a) Show that the p.u impedance of a transformer is same for primary and secondary side. 4 M

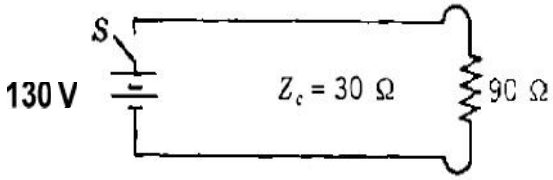
b) Two generators rated at 12 MVA, 13.2 kV and 25 MVA, 13.2 kV are connected in parallel to a busbar. They feed supply to two motors of inputs 8 MVA and 14 MVA respectively. The operating voltage of motors is 12.5 kV. Assuming base quantities as 60 MVA and 13.8 kV draw the reactance diagram. The per cent reactance for generators is 14% and that for motors is 19%. 6 M

14 Two 50 MVA, 50 Hz, 11 kV alternators with sub-transient reactance X'' = j0.1 p.u. and a transformer of 40 MVA 11 kV/66 kV and reactance of 0.08 p.u. are connected to a bus A. Another generator 60 MVA, 11 kV alternator with reactance of 0.12 p.u. is connected to bus B. Bus A and B are interconnected through a reactor of 80 MVA 20 per cent reactance. If a 3-phase fault occurs on the high voltage side of the transformer, calculate the current fed into the fault. 10 M

15 a) Define the surge impedance with reference to transmission line and deduce from the
first principles an expression for its value. 5 M

b) A long overhead line has a surge impedance of 500 ohms and an effective resistance of 6 ohms per km. If a surge of 400 kV enters the line at a certain point, calculate the magnitude of this surge after it has traversed 100 km and calculate the power loss and heat loss of the wave over this distance. Assume velocity of wave as 3 × 108 m/sec. 5 M

16 a) A dc source o f 110 V with negligible resistance is connected through switch S to a lossless transmission line having Z_c = 30 ohms. The line is terminated in a resistance of 90 ohms. If the switch closes at t = 0, plot v_R versus time until t = 5T, where T is the time for a voltage wave t o travel through the length of the line. 5 M



b) From fundamentals obtain the expression for visual critical voltages. 5 M

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17 A 3 phase transmission line, 165 km long, transmits a load of 95,000 kW at 0.80 p.f. lagging. The line voltage at the receiving end is 230 kV. The constants of the line are as follows:

A = D = 0.9785 $\angle 0.3^0$ B= 85.2 $\angle 77.47^0$ and C = 0.000503 $\angle 90.1^0$

Construct the receiving end and sending end circle diagrams for the transmission line and calculate:

a) Sending end voltage, current, power factor, regulation and efficiency of the transmission line.

b) The load in kW at 0.08 p.f lagging that could be carried at 8% regulation. 10 M

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Code No. 11094

FACULTY OF ENGINEERING

B.E. 3/4 (Inst.) I - Semester (Backlog) Examination, November / December 2018

Subject : Instrumentation Systems

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 State working principle of Electrical tacho-generator. (3)

2 How much degrees the strain gauges should be mounted along the shaft axis? (2)

3 Mention the law of Thermocouple. (2)

4 Explain measurement of stress in hollow shaft with diagram. (3)

5 An accelerometer has a seismic mass of 0.05 kg and a spring constant of 3 x 10 N/m, maximum mass displacement is $\pm$ 0.02 m. Calculate
(a) maximum measurable acceleration and (b) natural frequency (3)

6 Draw the diagram of Electromagnetic flow-meter. (2)

7 Explain basic principle of measurement of flow. (2)

8 Define Absolute Humidity. (2)

9 What are the significant characteristics of piezo-electric microphone? (3)

10 Explain the working of carbon microphone. (3)

PART – B (50 Marks)

11 (a) Explain the working of a DC tachogenerator with suitable diagram. (5)
(b) Write short notes on Strain gauges. (5)

12 (a) Explain the Magneto – Strictive transducer used for Torque measurement using suitable diagram. (5)
(b) A bimetallic strip element has one end fixed and other free with length of cantilever being 40mm. The thickness of each metal is 1 mm and element is initially straight at 20 C. Calculate the movement in free end in perpendicular direction from the initial line when the temperature is 180 C. (5)

13 Explain various kinds of Head-type flow meter depending on the physical principle of operation and other characteristics with suitable diagrams and equations. (10)

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14 (a) Explain the measurement of Liquid level with variable permeability method. (5)
(b) Explain the suitable diagram the working Ultrasonic method of measurement of Liquid. (5)

15 (a) Explain the briefly installation of pH meter with suitable diagram. (5)
(b) Explain the working of Inductive microphone with suitable diagram. (5)

16 (a) A piezo-electric accelerometer has a transfer function of 61mV/g and a natural frequency of 4500Hz. In a vibration test at 110Hz, a reading of 3.6V peak is obtained. Find the vibration peak displacement. (5)
(b) A load cell consist of a solid cylinder of steel 40mm in diameter four starin gauge bonded to it and connected into four arms of voltage sensitive bridge. The gauges are mounted to have Poisson arrangement. If G_f = 2.1, the bridge excitation voltage 6V, determine the sensitivity of the cell in V/kN. E = 200 GN/m^2 v=0.29. (5)

17 (a) Discuss the various types of liquid level meters. (5)
(b) Write short notes on capacitive Hygrometer. (5)

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Code No: 11096

FACULTY OF ENGINEERING

BE 3/4 (ECE) I - Semester (Backlog) Examination, November / December 2018

Linear Integrated Circuits & Applications

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

Note: Answer all questions from **Part-A** at one place in the same order Answer any **five** questions from **Part-B**

Part - A (25 Marks)

1. List the characteristics parameters of an Op-Amp? (3)
2. Draw equivalent circuit of Op-Amp circuit? (2)
3. Draw Difference amplifier using Op-Amp? (2)
4. Explain how op-amp act as V-I converter? (3)
5. Briefly explain about Precision Half wave rectifier? (3)
6. Differentiate active and passive filters? (2)
7. Define Capture range and Lock range in PLL? (2)
8. Explain Voltage to frequency conversion? (3)
9. Explain current limiting technique in IC 723? (3)
10. Calculate the values of LSB and full scale output of 8 bit D/A converter for the 0-10 volts range? (2)

PART – B (50 Marks)

11. Why frequency compensation required in Op-Amp? Explain any two compensation techniques in detail. (10)

12. a) Design a differentiator to differentiate an input signal at frequency 1 KHz and draw the circuit diagrams? (5)
    b) If a sine wave and square wave of 1Vp-p 100Hz is applied, find output voltage V_0 for both the signals and draw output wave forms? (5)

13. a) Design a second order Active Low pass filter having an cutoff frequency of 2.5 KHz gain of 1.5. (5)
    b) Explain Schmitt trigger without reference voltage? (5)

14. a) Draw block diagram of PLL (Phase Locked Loop) and explain the functions of each stage? (5)
    b) List the applications of PLL and explain any two with neat sketch? (5)

15. a) Explain the operation of Successive approximation ADC? (5)
    b) Draw functional diagram of IC 723 regulator? Explain its operation? (5)

16. a) With the neat sketch explain the operation of voltage follower. (4)
    b) Explain the working of R-2R ladder type D/A converter? (6)

17. a) Design an adder circuit using an Op-Amp to get the output expression as $sV_o = -(0.1\ V_1 + V_2 + 10\ V_3)$, where V_1 , V_2 ,V_3 are the inputs? (5)
    b) Explain Sample and Hold circuit using Op-Amp? (5)

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Code No. 11102

FACULTY OF ENGINEERING

B.E. 3/4 (Mech.) I-Semester (Backlog) Examination, November / December 2018

Subject : Applied Thermodynamics

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

Note: Answer All questions From Part-A and any FIVE questions From Part-B.

PART-A (25 Marks)

1. Draw P-V graph of 2-stage reciprocating air compressor and indicate work saved
2. Define for reciprocating air compressors (1) Clearance ratio (2) Volumetric efficiency
3. Define specific fuel consumption
4. Define variable specific heat
5. What are the factors influencing flame speed
6. What is homogenous and heterogeneous mixture in engines
7. State the advantages of installing an air pre heater
8. Classify boilers
9. Differentiate between convergent and divergent nozzles
10. Define nozzle efficiency

PART-B (5x10 = 50 Marks)

11. A two stage double acting air compressor, operating at 220 rpm takes in air at 1.0 bar and 27oC The size of LP cylinder is 360x400mm; the stroke of HP cylinder is same as that of LP cylinder and the clearance of both cylinders is 4% The LP cylinder discharges the air at a pressure of 4.0bar. The air passes through the inter cooler so that it enters the HP cylinder at 27oC and 3.80 bar, finally it is discharged from the compressor at 15.2 bar. The value of n in both the cylinders is 1.3, cp=1.0035kJ/kg K,R =0.287kj/kgK.
    Calculate i) The heat rejected in the intercooler
    ii) Diameter of HP cylinder
    iii) The power required to drive HP cylinder. 10

12 Explain
    a) Zenith carburetor with the help of a neat sketch 5
    b) An engine is required to develop 100kW, the mechanical efficiency of the engine is 86% and the engine uses 55kg/hr of fuel. Due to improvement in the design and operating conditions, there is reduction in engine friction to the extent of 4.8kW. If the indicated thermal efficiency remains the same, determine the saving in fuel in kg/hr 5

13 a) Explain stages of combustion in CI engines 5
    b) What are design criteria for CI engines 5

14 a) Sketch and explain Benson boiler 5
    b) Differentiate between Jet and Surface condensers. 5

15 In Steam nozzle, the steam expands from 4bar to 1 bar. The initial velocity is 60m/s and the initial temperature is 200^{o}C Determine the exit velocity if the nozzle efficiency is 92% 10

16 a) Explain the different methods of improving efficiency of Rankine cycle. 5
    b) Derive the expression for height of chimney in boilers 5

17 a) Explain the knocking in CI engines 5
    b) Draw the actual and theoretical valve timing diagram for 4-S diesel engines 5

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Code No. 11107

FACULTY OF ENGINEERING

B.E. 3/4 (Prod.) I-Semester (Backlog) Examination, November/December 2018

Subject : Applied Thermodynamics and Heat Transfer

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 advantages of multistage compression?
2 What is meant by volumetric efficiency of a compressor? Give its equation.
3 What are the effects of variable specific heats on the pressure and temperature in an actual cycle?
4 Define brake thermal efficiency, brake specific fuel consumption and indicated power.
5 What is meant by knocking in SI engines?
6 Mention the various types of lubrication systems used in IC engines.
7 Define thermal conductivity. How does it vary with temperature for solids, liquids and gases?
8 Differentiate between free convection and forced convection.
9 Define Nusselt number and Reynolds number.
10 Differentiate between parallel flow and counter flow heat exchanges.

PART – B (50 Marks)

11 a) Derive an expression for the work done in a single stage compressor with clearance. 5

b) The following data were obtained based on the performance test of a single acting reciprocating air compressor : Bore = 14 cm; stroke = 10 cm; Speed of compressor = 1200 rpm; suction pressure = 1 bar; suction temperature = 20^0C; Discharge pressure = 6 bar; Discharge temperature = 180^0C; shaft power = 6.25kW; mass of air delivered = 1.7kg/min;
Calculate the following :
a) Index of compression (n) b) Volumetric efficiency c) Indicated power
d) Isothermal efficiency e) Mechanical Efficiency 5

12 a) Explain the differences between two stroke and four stroke engines. 4

b) During the trial of a single-cylinder, four-stroke oil engine, the following results were obtained : Cylinder diameter = 20 cm; stroke = 40 cm; Mean effective pressure = 6 bar; Torque = 407 Nm; Speed = 250 rpm; Oil consumption = 4 kg/h; Calorific value of the fuel = 43000 kJ/kg; Cooling water flow rate = 4.5 kg/min; Air used per kg of fuel = 30 kg; Rise in temperature of cooling water = 45^0C; Temperature of exhaust gases = 420^0C; Room temperature = 20^0C; Mean specific heat of exhaust gas = 1 kJ/kg K; Specific heat of water = 4.18 kJ/kg K; Find i) Indicate Power (IP); ii) Brake Power (BP); iii) Draw a heat balance sheet for the test in kJ/h. 6

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13 a) Discuss the stages of combustion in SI engines. 5
b) Explain the working of a simple carburetor with a neat sketch. 5

14 a) Explain the importance of dimensional analysis in convection. 5
b) State Buckingham's π theorem. Obtain the relation for any one dimensionless number using this theorem. 5

15 a) Explain the terms absorptivity, reflectivity, transmissivity, emissivity and blackbody. 5
b) What is meant by LMTD? Draw the temperature distribution for a parallel flow and counter flow heat exchanger and derive the expression for LMTD for any one of these heat exchangers. 5

16 a) Give a detailed classification of heat exchangers. 4
b) In a counter-flow double pipe heat exchanger, water having specific heat of 4.18 kJ/kg K is heated from 25^0 C to 65^0 C by an oil with a specific heat of 1.45 kJ/kg K and mass flow rate of 0.9kg/s. The oil is cooled from 230^0 C to 160^0 C. If the overall heat transfer coefficient is 420 W/m^2 ^{0}C, calculate the following : i) The rate of heat transfer ii) The mass flow rate of water; iii) The surface area of the heat exchanger. 6

17 Write short notes on the following :
a) Different types of cooling systems in automobiles 4
b) Different modes of heat transfer and their equations 3
c) Comparison of air standard cycles and actual cycles 3

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Code No. 11110

FACULTY OF ENGINEERING

B.E 3/4 (A.E) I-Semester (Backlog) Examination, November / December 2018

Subject : Automotive Diesel Engines

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

Note: Answer All questions From Part-A & any FIVE questions From Part-B.

PART-A (25 Marks)

1	Explain ignition quality in diesel engine?	2
2	List the advantages and disadvantages of diesel engines	2
3	Classify fuel injection systems of diesel engines	3
4	Explain air injection in detail?	2
5	Compare direct and indirect injection combustion chambers	3
6	Define Knocking. Explain diesel knock	3
7	Write the differences between supercharging and turbo charging	3
8	What is meant by matching of turbo-charger?	2
9	What do you mean by performance maps?	3
10	What is 'Bharat Norms'?	2

PART-B (50 Marks)

11	A) Explain the four stroke diesel engine with neat sketch	5
	b) Discuss about the various diesel fuel properties and explain about any two test	5
12	What is meant by unit injection? Describe the construction details and working principle of mechanical governor	10
13	Explain about M type combustion chamber with a neat sketch	10
14.	What is meant by supercharger? Discuss its types and method of supercharging with neat sketch	10
15	Describe about conduct of heat balance test on diesel engine	10
16	Write short notes on the following a) Methods to improve in engine performance b) Emission standards in India	10
17	Explain with details a) Exhaust gas recirculation b) Charge cooling	10

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Code No. 11122

FACULTY OF ENGINEERING

B.E. 3/4 (IT) I-Semester (Backlog) Examination, November / December 2018

Subject : Database Management Systems

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	List the advantages of database system over traditional file processing.	2
2	Explain the different levels of abstraction.	3
3	Describe the basic structure of SQL query.	2
4	Distinguish between B-tree and B^+ - tree.	3
5	Differentiate between dense and sparse index.	2
6	Describe ACID properties of a transaction.	3
7	What is normalization? Explain need for normalization.	3
8	List and explain the two modes of locks on data items.	2
9	What is a checkpoint?	2
10	What are remote backup systems?	3

PART – B (50 Marks)

11	a) Describe database system structure with figure and explain its components.	6
	b) Describe the responsibilities of a database administrator.	4
12	Explain the fundamental and additional relational algebra operations along with examples.	10
13	Explain different forms of normalization along with examples.	10
14	Construct extendable hash structure for a file that contains records with the following search key values if the hash function h(x) = x mod 8 and buckets can hold three records. 2, 3, 5, 7, 11, 17, 19, 23, 29, 31	10
15	a) Explain timestamp based protocols.	6
	b) Explain how recovery can be done using log records.	4
16	Construct a B^+ - tree for following keys. When n = 4 2, 3, 5, 7, 11, 17, 19, 23, 29, 31	10
17	Write short notes on :	
	a) Views	3
	b) Integrity constraints	4
	c) Serializability	3

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Code No. 11468/CBCS

FACULTY OF ENGINEERING

B.E. V – Semester (CBCS) (Civil)(Main) Examination November/ December 2018

Subject: Reinforced Cement Concrete

Time: 3 Hours **Max. Marks: 70**

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

Part – A (20 Marks)

1. Explain the properties of the concrete and steel.
2. Explain the terms characteristics strength and partial safety factors.
3. Explain anchorage and development length.
4. Do you recommend for the reinforced RC beam? Explain reason.
5. What are the limitations for the deflection criteria?
6. Give the IS specifications required for the torsion design.
7. Explain the deflection criteria's in the design of slabs and beams.
8. Define two way slab.
9. Define yield line theory.
10. What do you understand from interaction diagrams?

Part – B (50 Marks)

11. a) Explain test procedures of concrete. 5M
    b) Discuss durability and serviceability requirements of RC structure. 5M

12. A reinforced concrete beam 280 mm x 480 mm effective depth is used over an effective span of 6m. It is subjected to a uniformly distributed load of 10kN/m inclusive of its own weight. Find the necessary steel reinforcement at the centre of the span. Take the allowable steel and concrete as 150N/mm^2 and 5N/mm^2 respectively and m =13. Use working stress method. 10M

13. Design a rectangular beam of 8m effective span which is subjected to dead load of 5kN/m and live load of 8kN/m. Use M25 grade concrete and fe500 grade steel. 10M

14. An AC beam has an effective depth of 500mm and breadth of 280 mm, it contains 4-20 mm fe550 grade of steel in tension. Determine the steel reinforcement needed shear force of 350 kN if it is M30 grade concrete. 10M

15. Design a two way slab for a room 7m x 6m clear in size if the super imposed load is 7kN/m^2 concrete. Use M25 grade concrete and fe550 grade steel. Use limit state method. 10M

16. Design a short column, square in section to carry an axial load of 3600kN using M25 grade concrete and fe550 grade steel. 10M

17. Design a footing for a rectangular column 350 mm x 480 mm carrying an axial service load of 1500kN. The net bearing capacity of the soil in 200 kN/m^2. Use M25 grade concrete and fe550 grade steel. 10M

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Code No. 11479 / CBCS

FACULTY OF ENGINEERING

B.E. (EEE) V-Semester (CBCS) (Main) Examination,

November / December 2018

Subject : Power Systems-II

Time : 3 hours **Max. Marks : 70**

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

PART – A (20 Marks)

1 What are the limitations of T and π methods? 2

2 For a medium length nominal T transmission line draw the circuit and the phasor diagram for lagging power factor conditions. 2

3 What are various methods of reducing corona effect? 2

4 Compare the reactive power compensation by shunt and series capacitors. 2

5 Write the steps for Symmetrical Fault calculations. 2

6 The generator emf is 1 p.u. and the subtransient reactance is 20%. Find the transient current. 2

7 Draw the connection of sequence networks for a double line fault at the terminals of an unloaded generator. 2

8 Show that $I_{abc} = [A]\ I_{012}$. 2

9 List out the causes of over voltages. 2

10 Why bewley lattice diagram is used? 2

PART – B (50 Marks)

11 a) Derive the expression for disruptive and visual critical voltages. 4

b) A 100-km long, 3-phase, 50Hz transmission line has following line constants: Resistance/phase/km = 0.1 ohms, Reactance/phase/km = 0.5 ohms. Susceptance/phase/km = 10×10^{-6}S. If the line supplies a load of 20 MW at 0.9 p.f. lagging at 66 kV at the receiving end, calculate by nominal π method :
i) sending end power factor ii) regulation iii) transmission efficiency. 6

12 a) 3-phase transmission line operating at 10 kV and having a resistance of 1 ohms and reactance of 4 ohms is connected to the generating station bus-bars through 5 MVA step-up transformer having a reactance of 5%. The bus-bars are supplied by a 10 MVA alternator having 10% reactance. Calculate the short-circuit kVA fed to symmetrical fault between phases if it occurs.
i) at the load end of transmission line
ii) at the high voltage terminals of the transformer 6

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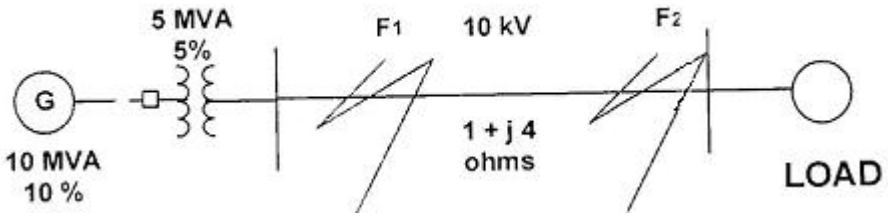
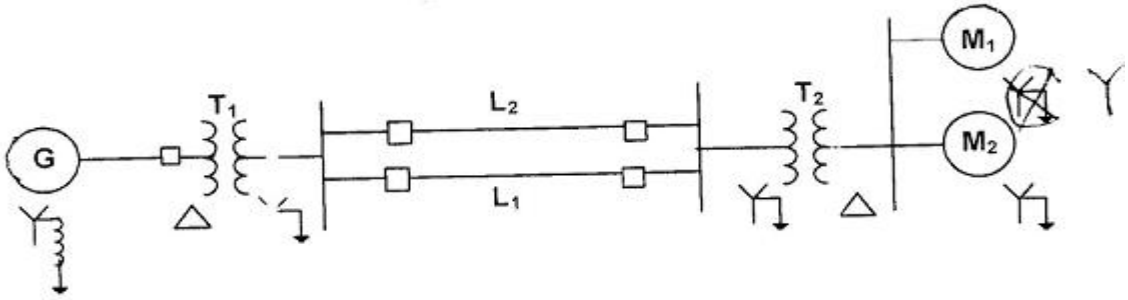


b) What is the per unit system? Why it is required in power system calculations? 4

13 Along with its advantages and disadvantages explain the following (with necessary diagrams) : 10
a) Booster transformer
b) Thyristor controlled reactor

14 A 300 MVA, 20 kV, 3-phase generator has a subtransient reactance of 20%. The generator supplies 3 synchronous motors through a 75 km transmission lines having transformers at both ends as shown in fig. In this, T1 is a three phase transformer with 350 MVA, 20/230kV, 10% reactance and T2 is made of 3 single phase transformers of rating 100 MVA, 127/13.2 kV, 10% reactance. Series reactance of the transmission lines are: line on L_1 is 0.55 ohms/km, line two L_2 is 0.45 ohm/km Motors: M_1 = 200MVA, 13.2kV, X = 20%, M_2 = 100MVA, 13.2kV, X = 20%. Draw positive sequence and negative sequence reactance diagrams with all the reactances marked in p.u. Select the generator rating as base values. 10



15 From fundamentals along with the necessary diagrams obtain the expressions for fault currents for an unloaded synchronous generator for the following types of faults (assume the neutral is grounded through an impedance Z_n). 10
i) L-L-G
ii) Single Line to ground

16 a) Two long transmission lines A and C are connected by a cable of 1 km long. The surge impedance of A,B,C are 400, 50 and 500 ohms respectively. A rectangular value wave of 25 kV magnitude and of infinite length is initiated in A and travels to C. Determine the first and second voltage. 5
b) Derive the reflection and refraction coefficients of a traveling wave line terminated with inductance. 5

17 a) Show that for a transmission line receiving end voltage and current (V_r and I_r) in terms of sending end voltage and current (Vs and Is) & auxiliary constants are given by $V_r = DV_s - BI_s$ and $I_r = -CV_s + AI_s$. 5
b) Explain the steps to draw the sending end power circle diagram. 5

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Code No. 11499/CBCS

FACULTY OF ENGINEERING

B.E. V-Semester (CBCS) (M/P/AE) Examination November/December 2018

Subject: Dynamics of Machines

Time: 3 Hours **Max. Marks 70**

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

PART – A (20 Marks)

1 What is the gyroscopic effect on a flying machine?
2 State D' Alembert's principle.
3 Differentiate between governors and fly wheel.
4 Differentiate between isochronous governor and sensitiveness of a governor.
5 Why complete balancing is not possible in reciprocating engine?
6 Why are the cranks of a locomotive, with two cylinders placed at 90^0 to each other?
7 Define swaying couple and Hammer blow with respect to locomotives.
8 Determine the time in which the mass in a damped vibrating system would settle down to 1/50 of its initial deflection for the following data, m=200 Kg, ζ = 0.22, S=40 N/mm. Also find the number of oscillations completed to reach this value of deflection.
9 How is the natural frequency of a shaft of negligible mass carrying a concentrated mass found?
10 State various conditions of damping in damped natural vibrations.

PART – B (50 Marks)

11 The length and connecting rod of a horizontal reciprocating engine are 200mm and 1 meter respectively. The crank is rotating at 400rpm. When the crank has turned 30^0 from the inner dead center, the difference of pressure between cover end and piston rod is 0.4 N/mm^2. If the mass of the reciprocating parts is 100Kg and a cylinder bore is 0.4 meters. Calculate (i) Inertia force (ii) Force on piston (iii) Piston effort (iv) Thrust on the side of the cylinder walls (v) Thrust in the connecting rod (vi) Crank effort.

12 The rotor of the turbine of a ship has a mass of 2500 kg and rotates at a speed of 3200 rpm counter-clockwise when viewed from stern. The rotor has radius of gyration of 0.4 m. Determine the gyroscopic couple and its effect when
(i) The ship steers to the left in a curve of 80 m radius at a speed of 15 knots (1knot=1860 m/h).
(ii) The ship pitches 5 degrees above and 5 degrees below the normal position and the bow is descending with its maximum velocity-the pitching motion is simple harmonic with a periodic time of 40 seconds.
(iii) The ship rolls and at the instant, its angular velocity is 0.4 rad/s clockwise when viewed from stern. Also find the maximum angular acceleration during pitching.

13 A hartnell governor having a central sleeve spring and two right angled bell crank lever operates between 290rpm and 310rpm for a sleeve lift of 15mm. The sleeve and ball arms are 80mm and 120mm respectively. The levers are pivoted at 120mm from the governor axis and mass of the ball is 2.5kg. The ball arms are parallel at lowest equilibrium speed. Determine (i) load on the spring at maximum and minimum speed and (ii) stiffness of the spring.

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14 The torque delivered by a two stroke engine is represented by T= (1000+300 sin 2θ-500 cos2θ) N-m where θ is the angle turned by the crank form the IDC. The engine speed is 250rpm. The mass of the flywheel is 400 kg and radius of gyration 400mm. Determine, (i) the power developed (ii) the total percentage fluctuation of speed (iii) the angular acceleration of flywheel when the crank has rotated through an angle of 60^0 from the IDC. (iv) The maximum angular acceleration and retardation of the flywheel.

15 The three cranks of a three cylinder locomotive are all on the same axle and are set at 120^0. The pitch of the cylinders is 1 meter and the stroke of each piston is 0.6 m. The reciprocating masses are 300 kg for inside cylinder and 260 kg for each outside cylinder and the planes of rotation of the balance masses are 0.8 m form the inside crank. If 40% of the reciprocating parts are to be balanced, find:

i. The magnitude and the position of the balancing masses required at a radius of 0.6m; and

ii. The hammer blow per wheel when the axle makes 6 r.p.s.

16 A 1.8 m long hollow shaft is supported in flexible bearings at the ends. It carries two wheels each of 60 kg-m mass, one at the centre of the shaft and the other at 450 mm from the centre. The external and internal diameters of the shaft are 80 mm and 50 mm respectively. Determine the lowest whirling speed of the shaft. The density of the shaft material is 7500 kg/m^3 and the modulus of elasticity is 210 GN/m^2.

17 A machine mounted on springs and fitted with a dashpot has a mass of 60 kg. There are three springs, each of stiffness 12N/mm. The amplitude of vibrations reduces form 45 to 8 mm in two complete oscillations. Assuming that the damping force varies as the velocity, determine the (i) Damping coefficient (ii) ratio of frequencies of damped and undamped vibrations (iii) periodic time of damped vibrations.

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Code No: 11488/CBCS

FACULTY OF ENGINEERING

B.E. V – Semester (Inst.) (CBCS)(Main) Examination, November/December 2018

Subject: Power Plant Instrumentation

Time: 3 Hours **Max. Marks: 70**

Note: Answer all questions from Part A & Answer any Five questions from Part B.

PART – A (20 Marks)

1) Draw the block diagram of power generation using TPP
2) Explain the sensor used in shaft and pedestal vibration measurement
3) Write briefly about pressure distribution curve in drought control.
4) Briefly explain how power can be generated using wind energy.
5) Draw the process diagram of steam temperature control.
6) What are the types of Glands for controlling exhaust pressure in steam turbine?
7) What types of burners are used in TPP?
8) With a neat block diagram explain TS?
9) What is Attemperation?
10) Write the classification of Draft in power plant.

PART – B (50 Marks)

11. a) What are the basic control loops in steam boiler instrumentation? 4

    b) With neat diagrams explain the steam generator control. 6

12. With a neat diagram explain power generation using Hydel power plant and write about water hammering. 10

13. What are the different types of condensate systems in TPP? Explain with neat diagram 10

14. With a neat diagram explain condenser vacuum control in Turbine monitoring & control. 10

15. a) P & I diagram of boiler 5

    b) Write short notes on smoke and dust monitoring. 5

16. With relevant diagrams explain Air-fuel ratio control system. Also discuss about excess O_2 trim with relevant process diagram. 10

17. Explain with relevant diagrams the piping system for pressure measuring Devices. 10

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Code No. 11493/CBCS

FACULTY OF ENGINEERING

B.E. (ECE) V-Semester (CBCS) (Main) Examinations, November /December 2018

Subject: Linear ICs and Applications

Time:3 Hours **Max. Marks: 70**

Note: Answer all questions from Part – A, each question carries equal marks & answer any 5 questions from Part – B

PART – A (10x2 = 20 Marks)

1. Distinguish between linear and digital ICs?
2. Draw equivalent circuit of an Op-Amp?
3. Explain the operation of voltage follower with circuit?
4. Indicate how two analog voltages are subtracted using OP-amp?
5. Explain how a comparator can be used as Zero crossing detector?
6. Explain briefly about All pass filter?
7. List any four applications of PLL?
8. Draw pin diagram of Timer IC 555?
9. Define Line and load regulation?
10. List various Analog to Digital conversion techniques?

PART – B (5x10 = 50 Marks)

11. a) Explain the various level shifting networks which are used in a typical Op-amp? (5)
    b) What is the difference between open loop and closed loop gain of an Op-Amp? Derive open loop and closed loop gain of an inverting amplifier using Op-amp with circuit (5)

12. a) Design a circuit using op-Amp which generate the output $V_o = - 2V_1 – 0.5 V_2 – 6 V_3$? (5)
    b) What is an active integrator? With neat diagrams explain the working of an active integrator (PRACTICAL)along with frequency response? (5)

13. a) Design a second order butter worth active high pass filter for a cutoff frequency of 1 KHz ? Plot its frequency response? (5)
    b) Draw the circuit diagram of a Precision Full-wave rectifier using Op-amp and explain its operation? (5)

14. Describe the Monostable mode of operation of IC 555 timer? Derive the Pulse width? Draw necessary waveforms and expressions? Mention the applications of IC 555 based monostable multi vibrator? (10)

15. a) Explain the working of Successive approximation ADC. Mention its advantages? (5)
    b) Explain the working of IC 723 as low Voltage regulator? (5)

16. a) Explain a non inverting comparators with $\pm V_{ref}$ along with their output waveforms? (5)
    b) Define CMRR and Slew rate? Derive an expression for CMRR? (5)

17. a) A 16 bit DAC has a step size of 7 mV. Determine the full scale output voltage, percentage resolution and output voltage for an input of (1011011001011100)? (5)
    b) Explain three Op-Amp instrumentation amplifiers? (5)

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Code No. 11519/CBCS

FACULTY OF ENGINEERING

B.E. V-Semester (CBCS) (IT) (Main) Examination, November / December 2018

Subject: Software Engineering

Time: 3 Hours **Max. Marks: 70**

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

Part – A (10x2=20 Marks)

1. Brief about process framework?
2. Differentiate TSP and PSP.
3. Define Aggregation and denote it with its notation
4. What are the various modeling approaches in analysis model
5. Define cohesion and coupling.
6. Write about basic behavioral modeling.
7. What are the principles of modeling?
8. Define cyclomatic complexity?
9. Differentiate verification and validation
10. Define Abstraction and Refinement

Part – B (5x10=50 Marks)

11. Describe the content , advantages and disadvantages of

    a) Spiral b) Incremental (5+5)

12. Define agile software process. Explain

    a) Scrum b) Extreme Programming (5+5)

13. a) Explain the concept of classes and their relationships with an Example. (5+5)

    b) Explain how a dataflow is mapped into architecture.

14. a) What are the things in UML? And explain in detail. (5+5)

    b) Explain the relationships in UML.

15. a) Explain Tom McCabe basis path testing with an example. (5+5)

    b) Write short notes on Boundary value analysis (BVA)

16. Explain various software testing strategies in detail. (10)

17. Write short notes on (5+5)

    a) SQA b) Art of Debugging

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Code No. 11510/CBCS

FACULTY OF ENGINEERING

B.E. V – Semester (CBCS) (CSE)(Main) Examination, November/December 2018

Subject: Database Management System

Time: 3 hours **Max. Marks: 70**

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

Part – A (2x10=20 Marks)

1) What is the need of data model in DBMS and give its classification
2) Write about data mining analysis.
3) What is a surrogate key? How can it be used for schema refinement?
4) What is a phantom record? Why do they occur?
5) Explain object-oriented data model.
6) Explain about JDBC.
7) Write about multiple granularity.
8) What is ARIES?
9) What is fuzzy check point?
10) Explain about Log based recovery

Part – B (5x10=50 Marks)

11 a) Describe about object based databases. (5M)
b) Explain the concept of design issues in E-R model with suitable examples. (5M)

12 a) Consider the following schema:
Suppliers (sid, sname, address)
Parts (pid, pname, color)
Catalog (sid, pid, cost)
Write the relational algebraic queries for the following:
i) Find the sids of suppliers who supply some red or green part
ii) Find the sids of suppliers who supply every red or green part
iii) Find the pids of parts supplied by at least two different suppliers. (6M)
b) Explain about Nested sub queries with example (4M)

13 a) Explain about decomposition using functional dependencies (7M)
b) Differentiate Between 3NF and BCNF. (3M)

14 Compare static and dynamic hashing Show the extendable hash structure for the search key values 2,3,5,7,11,17,19,23,29,31 where h(x)=x mod 8 and buckets can hold 3 records. (10M)

15 a) Explain briefly about dead lock handling. (5M)
b) Explain about Multi key access. (5M)

16 a) Write about weak levels of consistency with example. (5M)
b) Explain about restart recovery (5M)

17. Write short notes on
a) Failure with loss of non volatile (4M)
b) Bitmap indices (3M)
c) Data dictionary (3M)

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Code No. 11115

FACULTY OF ENGINEERING

B.E. 3/4 (CSE) I – Semester (Backlog) Examination, November / December 2018

Subject: Database Management Systems

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	Differentiate physical and logical data independence.	2
2	List the main functionalities of a database administrator.	3
3	Construct SQL queries that are equivalent to each of the following: i) ΠA(R) ii) R x S where relational schemas are R = (A, B, C); S = (D, E, F).	3
4	Define a view. Give one example.	2
5	Mention the use of functional dependency.	3
6	What is embedded SQL?	2
7	Draw the state diagram of a transaction.	2
8	What is view serializability?	3
9	What are the benefits of a strict two-phase locking protocol?	3
10	Define cascade rollback.	2

PART – B (5x10 = 50 Marks)

11	a)	Explain the advantages of Database Management system over traditional file processing system.	5
	b)	Discuss Referential Integrity constraint with example.	5
12	a)	Explain the Fundamental Relational algebra operations with examples.	4
	b)	Write SQL queries for the given schemas Employee: (Emp id, Ename, Designation, Salary, Address) Department: (Dept id, Dname, Dmanager) i) Retrieve the details of the employee who gets the maximum salary ii) List names of all employees who earn more than Rs. 10,000 iii) Retrieve the total amount spending towards employee salaries	6
13	a)	Define normalization and explain 1NF, 2NF, 3NF using appropriate examples.	5
	b)	Write a PL/SQL procedure to check whether the given string is palindrome or not.	5
14	a)	How to achieve serializability in transactions?	5
	b)	Show the extendable hash structure for the file which contains records with the following: search key values 2 3 5 7 11 17 19 23 29 31 Where hash function is h(x) = x mod 8 and bucket size is 3.	5
15	a)	Describe multiple granularity protocol.	5
	b)	Explain log based recovery in transactions.	5
16	a)	Describe the steps to convert ER model into relational model.	5
	b)	Explain the concept of specialization and generalization with suitable examples.	5
17	Write a short note on the following:		
	a)	Database languages	4
	b)	Shadow paging	3
	c)	Checkpoints	3

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