Code NO. 2597/CBCS

FACULTY OF ENGINEERING

B.E. V- Semester (CBCS) (Civil) (Main & Backlog) Examination, December 2019

Subject : Reinforced Cement Concrete

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

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

PART – A (2 x 10 = 20 Marks)

1. Give minimum cover to reinforcement and cement content required for RC structures in severe exposure conditions.
2. Calculate depth of neutral axis for balanced section 230mm x 350mm. Assume Fe500 steel and M20 grade concrete.
3. Give any three assumptions in yield line theory.
4. Differentiate between long and short columns.
5. Briefly write design procedure for columns subjected to axial load and biaxial bending.
6. Draw stress distribution diagram for isolated footings resting on a) cohesive soil, b) cohesionless soil.
7. Draw stress block diagram for RCC section and write expression for neutral axis.
8. Give deflection limits for slabs.
9. Draw a sketch to show development length and curtailment length for tension reinforcement, in a simply supported beam w.r.t to IS code provisions.
10. Differentiate between a cracked section and uncracked section.

PART – B (5x10 = 50 Marks)

11. A RC beam 300 mm x 600mm deep has a span of 5.5 m. Determine the necessary tension reinforcement required to resist a udl of 7.5 kN/m in addition to its own weight. σ_{cbc} = 5 N/mm^2 and σ_{st} = 275 N/mm^2.Use working stress method.

12. Design a SS beam section of effective span 8m, subjected to a factored udl of 20 kN/m. Assume width of section to be 250mm. Sketch reinforcement details. Use limit state method and M20 grade concrete and Fe500 steel.

13. A simply supported RCC beam of effective dimensions 250 x 400mm is subjected to a factored load of 35 kN/m. effective span of beam is 6.5m. It is provided with 4-Nos 16 mm diameter bars. Design the beam for shear reinforcement if 2 bars are bent up at 45°. Use limit state method and M20 grade concrete and Fe500 steel.

14. Design a two way slab for a room of size 6.0m x 4.3m clear, if super imposed load is 5.0 kN/m^2. It is simply supported with corners held down. Draw a neat sketch showing reinforcement details. Use M20 concrete and Fe500 steel.

15. Determine safe load a short column can carry if it has a section of 350mmx 450mm and reinforced with 6-Nos 20mm dia bars. Assume M20 concrete and Fe500 steel.

16. Design an isolated footing for a column size of 250 x 450 mm carrying a working load of 1500 kN. Take safe bearing capacity of soil to be 200 kN/m^2. Use M20 Grade concrete and Fe500 steel.

17. Write short notes on
    (a) Limit state method vs working stress method.
    (b) Design principles and procedure for design of RC staircases.
    (c) Detailing of reinforcement in beams and slabs for durability.

****

Code No.2608/CBCS

FACULTY OF ENGINEERING

B. E. (EEE)(CBCS) V– Semester (Main & Backlog) Examination, December 2019

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 (**10 x 2 = 20 Marks**)

1. What is the importance of generalized circuit constants of a transmission lines? 2
2. What is Ferranti effect? 2
3. Explain the basic working principle of Thyristor switched capacitor. 2
4. Explain the switching sequence for on-load tap changing transformer. 2
5. Explain the harmful effects of short-circuit fault on the power system. 2
6. Define synchronous, transient and sub-transient reactances. 2
7. List out the advantages of per unit system. 2
8. Draw the connections of sequence networks for line to ground fault through impedance Z_r. 2
9. Explain the specifications of traveling wave. 2
10. What is the importance of voltage control in power systems? 2

PART – B (**5 x 10 = 50 Marks**)

11. (a) A 3-phase, 50 Hz, 150 km transmission line has a resistance, inductive reactance and capacitive shunt admittance of 0.1Ω, 0.5Ω and 3 x 10^{-6} S km per phase. If the line delivers 50 MW at 110 KV and at 0.8 power factor lagging, determine the sending end voltage and current. Assume a nominal Πcircuit for the line. 6

    (b) What is Corona and what are the advantages and disadvantages of corona. 4

12. (a) A 3-phase induction motor delivers 500 HP at an efficiency of 90% when the operating power factor is 0.85 lag. A loaded synchronous motor with a power consumption of 130 KW is connected in parallel with the induction motor. Calculate the necessary KVA and operating power factor of the synchronous motor if the overall power factor is to be unity. 6

    (b) Explain with neat diagram the operation of Static Var compensator and also give some advantages. 4

13. (a) A 33 KV, 3-phase transmission line of resistance 2Ω and reactance 8Ω connected at each end to 3 MVA, 33/6.6 KV, Δ/Y transformer. The resistance and reactance of transformer are 2% and 5% respectively. Determine the fault current in each section of the system when a 3-phase fault takes place on the low voltage side of the transformer. 6

…..2

(b) A synchronous generator rated 500 KVA, 440 V, 0.1 per unit, sub-transient reactance is supplying a passive load of 400 KW at 0.8 lagging power factor. Calculate the initial symmetrical rms current for a 3-phase fault at the generator terminals. 4

14. From fundamentals along with necessary diagrams obtain the expressions for fault currents for a unloaded synchronous generator for the following types of faults (assume the neutral is grounded through an impedance Zn.) 10

(i) L-L-G Fault.

(ii) Double line to ground fault.

15. (a) Derive the expressions for reflection and refraction coefficients. 5

(b) Explain the various causes of over voltages in a three phase transmission line. 5

16. (a) A 10 MVA, 13.8 KV turbo-generator having $X_d^{11} = X_2 = 15\%$ & $X_0 = 5\%$ is about to be connected to a power system. The generator has a current limiting reactor of 0.7 Ω in the neutral. Before the generator is connected to the system, its voltage is adjusted to 13.2KV when a L-L-G fault develops at terminals b & c. Find initial symmetrical rms currents in the ground & in line b. 6

(b) With the help of a neat diagram, explain the operation of a off load tap changing transformers. 4

17. (a) Derive the expression for visual critical voltages. 5

(b) Determine the short circuit capacity of a bus. 5

******

Code No. 2614/CBCS

FACULTY OF ENGINEERING

B.E. (Inst.) (CBCS) V – Semester (Main & Backlog) Examination, December 2019

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. What is the importance of Instrumentation in Power generation? (2)
2. Mention different types of Boilers. (2)
3. Draw the P&I diagram of boiler. (2)
4. What is meant by Swelling and Shrinking in boiler? (2)
5. What is the function of governing systems in turbine? (2)
6. What is shell temperature monitoring? (2)
7. What different control loops are formulated in turbine monitoring & control. (2)
8. What methods are adopted to monitor the vibration of a turbine? (2)
9. Draw the layout of Hydro Electric Plant. (2)
10. Draw the block diagram of Nuclear Power Plant. (2)

PART – B (50 Marks)

11. (a) With a neat diagram, explain the piping and instrumentation drawing of a boiler. Indicate all control loops that can be established without and redundancy. (5)
    (b) Explain feed water conditioning using suitable diagram. (5)

12. (a) What is the primary and secondary transducer for the measurement of pressure? (5)
    (b) Explain the LVDT type pressure sensor with a neat diagram. (5)

13. (a) Explain boiler drum level control with relevant diagram. (5)
    (b) Write short notes on De-Aerator Control with relevant diagram. (5)

14. (a) what is the main purpose of heat exchangers in the turbine monitoring and control? Explain its operation with neat diagram. (5)
    (b) What is meant by vibration? Explain any one method of vibration measurement. (5)

15. (a) Explain the piping diagram of different types of different types of nuclear power plant. (5)
    (b) Write short notes on power generation using Wind energy. (5)

16. (a) What are Pulverisers? With a neat diagram, explain the ball and race pulverizing mill. (5)

    (b) Discuss the speed control of turbines. (5)

17. Write short notes on the following: (10)
    (a) Air/fuel ratio control in TPP.
    (b) Shaft Vibration Measurement.

******

Code No. 2622 / CBCS

FACULTY OF ENGINEERING

B.E. (ECE) V - Semester (CBCS) (Main & Backlog) Examination, December 2019

Subject : Liner ICs and Applications

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 is a level translator circuit? Why is it used with cascaded differential amplifiers?
2 Define CMRR and explain about its importance.
3 What is meant by virtual grounds?
4 Explain the difference between normal rectifiers and precision rectifiers.
5 What are the advantages of Active filters over Passive filters?
6 Explain the operation of Schmitt trigger using OPAMP.
7 Explain any one application of Astable multivibrator using 555 timer.
8 Explain how VCO acts as voltage regulators.
9 Explain the features of fixed voltage regulators.
10 What output voltage would be produced by D/A converter whose output range is 0 to 5v and input binary is 10110011.

PART – B (50 Marks)

11 a) Define the following OPAMP electrical parameters.
i) Input bias current ii) input offset voltage iii) PSRR
iv) output offset voltage and also write their typical values 5
b) For a given differential amplifier two set of input signals are applied.
i) Vs1 = 200uV and Vs2 = 220uV ii) Vs1 = -Vs2 = 20uV. Obtain the output due to both set of input. If CMRR = 80 dB and Ad = 1000. 5

12 a) Explain the operation of Instrumentation Amplifier using three OPAMPs with neat diagram. 6
b) Design a practical integrator which operates between 1.5 KHz to 15 KHz. 4

13 a) Draw the circuit diagram of second order low pass Butterworth filter and derive the expression for its voltage gain. 6
b) Explain the operation of Clamper circuit using precision rectifiers. 4

14 a) Draw the circuit diagram of Astable Multivibrator using 555 timer and explain its operation. Also derive the expression for frequency of oscillations. 6
b) Draw the block diagram of PLL and explain the function of each block. 4

15 a) Explain the operation of inverted R-2R ladder D/A converter with neat diagram. 6
b) Explain the IC 723 regulator. 4

16 a) Explain the operation of triangular waveform generator and derive the expression for frequency of oscillations. 6
b) Explain about voltage to current converter with grounded load. 4

17 Write short notes on
a) Narrow band reject filters 5
b) Flash type A/D converter 5

******

Code: 2628/CBCS

FACULTY OF ENGINEERING

B.E V-Semester (CBCS) (M /P/AE) (Main& Backlog) Examination, December 2019

Subject: Dynamics of Machines

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

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

Part - A (20 Marks)

1. When does a gyroscopic couple occur? What is the expression for its magnitude?
2. What is the difference between piston effort, crank effort and crank-pin effort?
3. Draw and explain the turning moment diagram of a single cylinder double acting steam engine.
4. Explain the term height of the governor. Derive an expression for the height in the case of a Watt Governor. What are the limitations of a Watt governor?
5. Explain the terms 'static balancing' and 'dynamic balancing'. State the necessary conditions to achieve them
6. How the different masses rotating in different planes are balanced?
7. What are the causes and effects of vibrations?
8. State the terms 'under damping, critical damping' and 'over damping'
9. What are multifilar systems? Where are they used?
10. State the effect of inertia of a shaft on the free torsional vibrations.

Part - B (5x10 = 50 Marks)

11 (a) Discuss the equilibrium of two and three force members.

(b) The propeller of aero has a mass of 56 kg and has radius of gyration of 0.9 m. The propeller shaft rotates at 1900 r.p.m, clockwise, as viewed from tail end. The plane turns left, making a U turn, i.e., through 180^0 of 120 m radius, at a speed of 330 km/hr, determine the gyroscopic couple and its effect on the aircraft. Also find the reactions on bearings if the distance between two bearings of the propeller is 0.8m.

12. The turning-moment diagram for a multi cylinder engine has been drawn to a vertical scale of 1 mm = 500 N-m and a horizontal scale of 1 mm = 5^0. The areas above and below the mean torque line are 500, -250, 270, -390, 190, -340, 270, -250 mm^2. The fluctuation of speed is limited to 1.8% of the mean speed which is 150 rpm. The density of the rim material is 7500 kg/m^3 and width of the rim is 1.5 times its thickness. The centrifugal stress (hoop stress) in the rim material is limited to 3 MPa. Neglecting the effect of the boss and arms, determine the diameter and cross section of the flywheel rim.

13. A shaft carries four masses A, B, C and D of magnitude 200 kg, 300 kg, 400 kg and 200 kg respectively and revolving at radii 80 mm, 70 mm, 60 mm and 80 mm in planes measured from A at 300 mm, 400 mm and 700 mm. The angles between the cranks measured anticlockwise are A to B 45°, B to C 70° and C to D 120°. The balancing masses are to be placed in planes X and Y. The distance between the planes A and X is 100 mm, between X and Y is 400 mm and between Y and D is 200 mm. If the balancing masses revolve at a radius of 100 mm, find their magnitudes and angular positions.

..2

14. A shaft 1.5 m long, supported in flexible bearings at the ends carries two wheels each of 50 kg mass. One wheel is situated at the centre of the shaft and the other at a distance of 375 mm from the centre towards left. The shaft is hollow of external diameter 75 mm and internal diameter 40 mm. The density of the shaft material is 7700 kg/m^3 and its modulus of elasticity is 200 GN/m^2. Find the lowest whirling speed of the shaft, taking into account the mass of the shaft.

15. A mass of 50 kg suspended from a spring produces a statically deflection of 17 mm and when in motion it experiences a viscous damping force of value 250 N at a velocity of 0.3 m/s. Calculate the periodic time of damped vibration. If the mass is then subjected to a periodic disturbing force having a maximum value of 200 N and making 2 cycles /s, find the amplitude of amplitude motion.

16. The two rotors A and B are attached to the end of a shaft 500mm long. The mass of the rotor A is 300 kg and its radius of gyration is 300 mm. The corresponding values of the rotor B are 500 kg and 450 mm respectively. The shaft 70 mm in diameter for the first 250 mm, 120 mm for the next 70 mm and 100 mm diameter for the remaining length. The modulus of rigidity for the shaft material is 80 GN/m^2. Find (a) the position of the node, and (b) the frequency of torsional vibration.

17. Write a short note on the following.
    (a) Hartnell and Hartung governors
    (b) Forced vibrations and Resonance
    (c) Rayleigh's method for multi rotor system.

****

Code No. 2639/CBCS

FACULTY OF ENGINEERING

B.E. V Semester (CSE) (Main & Backlog) Examination, December 2019

Subject: Database Management Systems

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

Note: Answer all questions in Part – A & answer any five questions from Part – B

PART-A (20 Marks)

1. List the Database Administrators functions.
2. Discuss Entity-Relationship design issues in brief.
3. Discuss SQL sub languages.
4. Discuss about group by clause and having clause.
5. What is Embedded SQL?
6. Define Trigger. Write syntax of Trigger.
7. Define ACID properties.
8. What is the difference between primary and secondary index?
9. What is stable storage?
10. Define recoverability.

PART-B (50 Marks)

11. a)Explain the Differences between File Processing System and DBMS 5

    b) Explain Database design for Banking Enterprise using E-R diagram. 5

12. a) Explain String Operations and Aggregate functions in SQL. 4

    b) Explain Fundamental and Additional Relational-Algebra Operations with suitable example. 6

13. a) Write Dynamic SQL program to retrieve data from Database 6

    b) Discuss Features of Good Relational Design. 4

14. a) Insert the following keys in a B+ tree for the order n mentioned below 4

    i) n=3

    5 7 23 36 2934 39 42 47 51 5559 62

    b) Explain bit map indices? How they are useful in multi key access 6

15. a) What is Concurrent control? Explain Lock based protocols. 5

    b) Explain ARIES algorithm in detail 5

16. a) Explain Log based recovery. 6

    b) Explain Multiple Granulity Protocols. 4

17. Write short notes on

    a) Recursive Queries 3

    b) Storage Structure 4

    c) Thomas write Rule 3

****

Code No. 2648 / CBCS

FACULTY OF ENGINEERING

B.E. (IT) V-Semester (CBCS) (Main & Backlog) Examination, December 2019

Subject : Software Engineering

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

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

PART – A (**10 x 2 = 20 Marks**)

1 List activities involved in a generic process model of software engineering.
2 Define system Engineering and Software Engineering.
3 Define data attributes with an example.
4 Define design process.
5 What are stereotypes and constraints in UML?
6 Write about negotiation requirements.
7 What are tagged values in UML explain with example?
8 Define Refactoring.
9 What is regression testing?
10 Define Integration testing.

PART – B (**5 x 10 = 50 Marks**)

11 a) Explain about agility? Write its principles. 7
b) List the common modeling techniques for a class diagram. 3

12 Discuss the concept of Extreme Programming (XP) process model. 10

13 a) Explain about requirements elicitation in detail. 5
b) Develop a use case for making a withdrawal at an ATM machine. 5

14 Explain the process of architectural mapping using data flow. 10

15 a) Explain class based modeling. 5
b) Explain in detail about validation and system testing. 5

16 Explain about interaction diagram with example. 10

17 a) What is debugging? Illustrate debugging process with a help of neat diagram. 8
b) Differentiate debugging and testing. 2

******

Code No.2082

FACULTY OF ENGINEERING

BE 3/4 (Civil) I – Semester (Backlog) Examination, Dec 2019

Subject: Reinforced Cement Concrete

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 the need for the reinforcement in concrete. (3)
2. Define working stress method and explain. (3)
3. Give any two assumptions made in limit state of collapse. (2)
4. How do you design a member for shear and torsion? (2)
5. What is development length? explain. (3)
6. Give any three assumptions made in limit state of collapse. (2)
7. Give IS specifications required for design of slabs. (2)
8. Define two way slabs. (2)
9. Explain the concept of yield line theory. (3)
10. What is the need for combined footing? (3)

PART – B (50 Marks)

11. a) Explain serviceability and durability of concrete. (5)
    b) What are the stress block parameters and how do you obtain them? (5)

12. A reinforced concrete beam 300mm x 600 mm effective depth is used over an effective spam of 6m. It is subjected to a uniformly distributed load of 12kN/m inclusive of its own weight. Find the necessary steel reinforcement at the inclusive of its own weight. Find the necessary steel reinforcement at the centre of the spam. Take the allowable steel and concrete as 150N/mm^2 and 5N/mm^2 respectively and m = 13. Use working stress method. (10)

13. Design a rectangular beam of 8m effective spam which is subjected to dead load of 12kN/m and live load of 8kN/m^2. Use M25 grade concrete and fe500 grade steel. (10)

14. An RC beam has an effective depth of 500mm and breadth of 350mm. it contains 4-25 mm fe500 grade of steel in tension. Determine the steel reinforcement needed for a factored sheer force of 280kN if i) Mix is M25 and If Mix is M35. (10)

15. Design a two way slab for a room 7m x 6m clear in size if the super imposed load is 8kN/m^2 concrete. Use M30 grade concrete and fe550 grade steel. Use limit state method. (10)

16. Design a short column, square in section to carry an axial load of 3000kN using M30 grade concrete and fe 550 grade steel. (10)

17. Design a footing for a rectangular column 380mm x 480 mm carrying an axial service load of 1500kN. The net bearing capacity of the soil is 280kN/m^2. Use M30 grade concrete and fe550 grade steel. (10)

****

Code No. 2088

FACULTY OF ENGINEERING

BE 3/4 (EEE) I – Semester (Backlog) Examination, December 2019

Subject: Power Systems – II

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

Answer all questions from Part – A & any five questions from Part – B.

Part – A (25 Marks)

1. Distinguish between ac and dc resistance of a conductor. Why the two differ? 2 M
2. Obtain the exact condition for zero regulation for a short transmission line. 3 M
3. List out the reasons to keep voltage at the consumer's terminals be within prescribed limits? 2 M
4. Show that the load voltage V_2 is not affected much due to the component of the load. 3M
5. Why excitation control is necessary in an alternator? Brief it. 2 M
6. Show the per unit impedance of a transformer is the same regardless of the side which it is viewed. 3 M
7. Draw the connections of sequence networks for line to ground fault through an impedance Z_r. 2 M
8. Explain the theory of symmetrical components. 3 M
9. Define the crest, front, tail and velocity of a travelling wave. 3 M
10. Explain the reasons for not redistribution of currents and voltages instantaneously in a power system switching's. 2 M

Part – B (50 Marks)

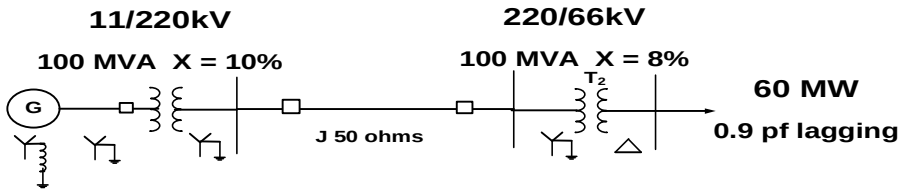
11. (a) Determine the sending end voltage current, power and power factor for a 160 km section of 3-phase line delivering 50 MVA at 132 kV and p.f. 0.8 lagging. Also find the efficiency and regulation of the line. Resistance per line 0.1557 ohm per km, spacing 3.7 m,6.475 m, 7.4 m transposed. Evaluate the A, B, C, D parameters also. Diameter 1.956 cm. 6 M

    (b) Discuss the factors effecting corona. 4 M

12. With necessary diagrams explain in detail about: 10M
    (a) Tap changing transformers
    (b) Thyristor switched capacitor and
    (c) Static var compensator

13. a) Derive the expression for average power in terms of symmetrical components. 4 M

    b) Below shows the schematic diagram of a radial transmissionsystem. The ratings and reactance of the various components are shown. A load of 60 MW at 0.9- power factor lagging is tapped from the66 kV substation which is to be maintained at 60 kV. Calculate the terminal voltage of the synchronous machine. 6 M



..2

14.(a) A synchronous generator whose neutral is grounded through a reactance X_n. The generator has balanced emfs and sequencer eactancesX_1,X_2., and X_0 such that $X_1 = X_2 > Xo$.

i) Draw the sequence networks of the generator as seen from the terminals.

ii) Derive expression for fault current for a solid line-to-ground fault on phase a. 5 M

(b) The voltagesat the terminalsof a balancedload consistingof three 20ohm Y-connected resistors arc 2OO□0° 100□225°and 200 □151° V.Find the line currents from the symmetrical components of the linevoltagesif the neutralof the load is isolated.What relation exists between the symmetrical components of the line and phase voltages.

Find the power expanded in three 20 ohm resistors from the symmetrical components of currents and voltages. 5 M

15. (a) A 3-phase transmission line has conductors 1.5 cms in diameter spaced 1 meter apart in equilateral formation. The resistance and leakance are negligible. Calculate

(i) the natural impedance of the line,

(ii) the line current if a voltage wave of 11 kV travels along the line,

(iii) the rate of energy absorption, the rate of reflection and the state and the form of reflection if the line is terminated through a star connected load of 1000 ohm per phase,

(iv) the value of the terminating resistance for no reflection and

(v) the amount of reflected and transmitted power if the line is connected to a cable extension with inductance and capacitance per phase per cm of 0.5×10^{-8} H and 1×10^{-6}μF respectively. 6 M

b) A surge of 100 kV travelling in a line of natural impedance 600 ohmsarrives at a junction with two lines of impedances 800 ohms and 200 ohms respectively. Find the surge voltages and currents transmitted into each branch line. 4 M

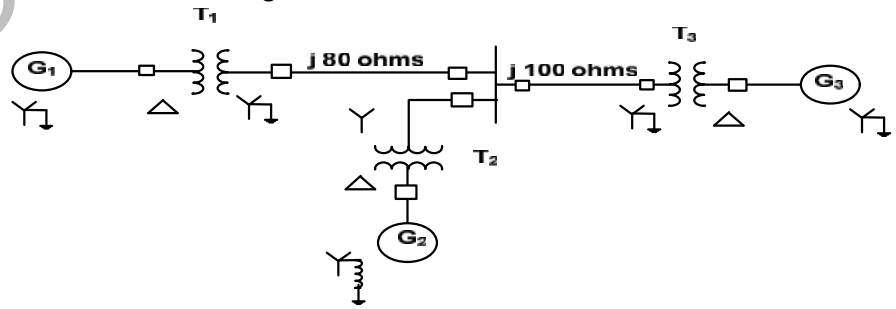
16. The single line diagram of an unloaded power system is shown in below fig. The generator and transformers are rated as follows:

G_1= 22MVA, 13.8 kV, X''= 20%, G_2 = 32MVA, 18 kV, X''= 20%,

G_3 = 30MVA, 20 kV, X''= 20%, T_1 = 25MVA, 220/13.8 kV, X = 10%,

T_2 = 3 single phase units each rated at 10MVA, 127/18 kV, X= 10%,

T_3 = 35MVA, 220/22 kV, X= 10%. Draw the reactance diagram using a base value of 50MVA and 13.8 kV on the generator G_1. 10



17. A 50 Hz, three-phasg,275 kY,400 km transmission line has the following parameters: Resistance= 0.035 ohms/km per phase, Inductance= 1.1 mH/km per phase, Capacitance= 0.012 pF/km per phase. If the line is supplied at 275 kV, determine the MVA rating of a shunt reactor having negligible losses that would be required to maintain 275 kV at the receiving-end whenthe line is deliveringno load. Use nominal ∏ - method. Draw the circle diagram. 10 M

****

Code No.2094

FACULTY OF ENGINEERING

B.E. 3/4 (Inst.) I-Semester (Backlog) Examination, December 2019

Sub: Instrumentation Systems

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 the principle of DC tacho generator. [3]
2. Define turbulent flow. [2]
3. Discuss hair hygrometer. [3]
4. Define PWL. [2]
5. Draw concentric and eccentric orifice plates. [3]
6. What do you mean by RH? Explain it. [2]
7. Write the principle of stroboscope. [2]
8. Discuss Inverse square law. [3]
9. Explain law of additive emf. [2]
10. What do you mean by hydraulic load cell? [3]

PART – B (50 Marks)

11. a) Explain Piezo electric accelerometer. [5]
    b) Explain with neat diagram AC Tachogenerator. [5]

12. Derive an equation of volumetric flow rate for Head type flow meter. [10]

13. a) Explain in detail Rota meter with neat diagram. [6]
    b) Write advantages and disadvantages of Head type flow meter. [4]

14. a) Explain in detail sound level meter with neat block diagram. [6]
    b) The following SPLs were measured for a machine operating in a noisy environment. SPL of machine in addition to background noise is 90 db. SPL of background noise is 80db. Determine the SPL of machine alone. [4]

15. a) Discuss the basic methods of force measuring devices. [6]
    b) Write a short note on Bonded Strain gauge accelerometer. [4]

16. a) Explain with neat diagram, measurement of liquid level using gamma rays. [5]
    b) Explain resistive hygrometer in detail. [5]

17. Write a short note on
    a) Hot wire anemometer. [5]
    b) Measurement of temperature by radiation method. [5]

****

Code No. 2096

FACULTY OF ENGINEERING

B.E. 3/4 (ECE) I - Semester (Backlog) Examination, December 2019

Subject : Linear Integrated Circuits and Applications

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 equivalent of an operational amplifier.	2
2	Define i) Slew rate ii) CMRR iii) PSRR	3
3	Draw Op-Amp Adder circuit and derive its output voltage equation.	3
4	Distinguish between open loop and closed loop configuration.	2
5	Draw the circuit of Notch Filter.	2
6	Discuss about Op-Amp Astable multivibrator as voltage to Frequency converter with circuit diagram.	3
7	Draw the pin configuration of IC 566 VCO.	2
8	Write characteristics of 78xx series regulators.	3
9	Write the advantages and disadvantages of successive approximation A/D converter.	2
10	Define Resolution of D-A converter. What is the resolution of 8 bit DAC if V ref = 5V.	3

PART – B (50 Marks)

11	a)	Explain different external frequency compensation techniques.	5
	b)	Obtain the voltage gain of dual input unbalanced output differential amplifier.	5
12	a)	Explain the operation of Precision full wave rectifier with neat sketches.	5
	b)	Analyze the circuit of practical differentiator using Op-Amp and find the frequency response.	5
13	a)	Draw and explain the circuit of square wave generator using Op-Amp and also derive the expression for frequency of oscillations.	5
	b)	Draw the first order high pass filter and obtain the expression for its voltage gain and frequency response.	5
14	a)	Explain the operation of Function Generator IC.	5
	b)	Draw pin configuration and internal block diagram of PLL IC 565 and explain its operation.	5
15	a)	With neat circuit diagram, explain the operation of successive approximation analog to digital converter.	7
	b)	Design an adjustable regulator from the 7810 regulator to get an output voltage of 15V. Assume I_{cq}=5.1mA.	3
16	a)	Explain the operation of a Logarithmic Amplifier with the help of a neat sketch.	5
	b)	Draw and explain Schmitt trigger with reference voltage using Op-Amp.	5
17	a)	Explain current limiting and current fold back techniques.	5
	b)	Explain voltage to current converter with grounded load.	5

******

Code No: 2104

FACULTY OF ENGINEERING

B.E. 3/4 (Mech.) I - Semester (Backlog) Examination, Dec. 2019

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 (10x2.5 = 25Marks)

1. Classify Compressors.
2. Define isothermal efficiency of reciprocating air compressors.
3. What is the significance of Heat Balance sheet?
4. Define specific fuel combustion.
5. Define Octane number.
6. Define Delay period in engine combustion.
7. Differentiate between water tube and fire tube boilers.
8. What is boiler draught?
9. Sketch Rankine and modified Rabkine cycles on P-V and T-S graph.
10. Define nozzle efficiency.

PART – B (5 x 10 = 50 Marks)

11. a) Discuss in detail the effect of clearance volume on compressor work done. 5M
    b) In single stage single acting reciprocating compressor is required to compress 0.015 m^3 of air per cycle from 1 bar to 6 bar pressure. Calculate the power required if the compressor runs at 180 RPM under the following conditions of compression.
    (i) Isothermal (ii) Polytrophic, n = 1.25 (iii) Adiabatic, = 1.4 5M

12. a) Differentiate between magneto and battery ignition systems. 5M
    b) The following observations were recorded during a test on a single cylinder oil engine.
    Bore = 300 mm, Stroke = 450 mm, Speed = 300 RPM.
    IMEP = 6 bar, Net brake load = 1.5 kN
    Brake drum diameter = 20 mm
    Calculate : (i) Indicated power
    (ii) Brake power and
    (iii) Mechanical efficiency 5M

13. Explain in detail the combustion phenomenon in S.I system. 10M

14. Explain the working of Cochran boiler with the help of a neat sketch. 10M

15. a) What is critical pressure ratio of nozzles 5M
    b) Dry air at a pressure of 12 bar and 300^oC is expanded isentropically through a nozzle at a pressure of 2 bar. Determine the maximum discharge through the nozzle of 50 mm^2 area. 5M

16. a) Explain the process of reheating system in steam turbines with the help of a neat sketch. 5M
    b) Explain working of any one type of surface Condenser. 5M

17. a) What are the different Lubrication systems in IC engines? 5M
    b) How pollution is caused from engines. Suggest some remedies to control. 5M

****

Code No: 2109

FACULTY OF ENGINEERING

B.E. 3/4 (Prod.) I – Semester (Backlog) Examination, December 2019

Subject: Applied Thermodynamics and Heat Transfer

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

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

PART – A (10 x 2.5 = 25 Marks)

1 Define isothermal efficiency of a Reciprocating air compressor.
2 What is meant by perfect inter cooling?
3 Mention different components of heat balance sheet of an IC engine.
4 What is detonation in IC engine?
5 Name the elements of fuel injection system in CI engine.
6 What is the necessity of cooling an IC engine?
7 State the significance of critical thickness of insulation for cylinders and write its equation.
8 Explain thermal resistance in Heat conduction.
9 State Buckingham pi theorem.
10 Give the classification of heat exchangers.

PART – B (50 Marks)

11 An air compressor takes in air at 1 bar and 20^{o}C and compresses it with index of compression 1.2. It is then delivered to a receiver at constant pressure of 10 bar. Determine
(a) Temperature at the end of compression
(b) work done.

12 (a) Mention the differences between two stroke and four stroke engines.
(b) Why there exists an upper limit for compression ratio in SI engine?

13 (a) What are the different methods used to create turbulence in mixture in CI engines?
(b) List the factors to control abnormal combustion in CI engines.

14 (a) Explain the analogy between conduction heat transfer and electrical energy flow.
(b) Derive an expression for conduction heat transfer of hollow cylinder.

15 Why only a specific part of electromagnetic spectrum is called thermal radiation? Explain Wein displacement law of radiation? How it is arrived at from Plancks law?

16 The power output of an IC engine is measured by a rope brake dynamometer. The diameter of brake pulley is 700mm and rope diameter is 25mm. The load on one side of rope is 50Kg mass and spring balance reads 50N. The engine running at 900rpm consumes fuel of calorific value 44000 kj/Kg at a rate of 4Kg/hr. Calculate
(a) BSFC
(b) Brake thermal efficiency.

17 A thin plate receives radiation on one side from a source at 650^{o}C and radiates on the other face to a surface at 150^{o}C, at steady state. Determine the temperature of the plate. Assume shape factor as one. Also determine radiation heat transfer from plate to surface. Neglect convection heat flow.

****

Code No. 2112

FACULTY OF ENGINEERING

B. E. 3/4 (A.E) I – Semester (Backlog) Examination, December 2019

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. Define cetane number and ignition quality.
2. What are the good qualities of fuel used in compression ignition engines?
3. What is PTFI?
4. Define maximum speed and all speed governor.
5. Define the terms swirl and scquish.
6. What are the applications of pintle nozzle?
7. What is delay period? How to measure it?
8. What are the applications of supercharging?
9. What is the Bharat and euro norms of standard of pollution?
10. Draw the performance maps of diesel engine.

PART – B (10 x 5 = 50 Marks)

11. Sketch Dual cycle on P-V and T-S diagram and derive an equation for thermal efficiency of dual cycle and also write the equation for mean effective pressure.
12. Describe the construction and working of the jerk-type fuel injection pump with a neat sketch.
13. Describe with suitable sketches, the various stages of combustion in a diesel engine.
14. What is turbo charging explain with suitable diagram and how it is advantageous?
15. Explain the variables that affect the performance of an automotive diesel engine and describe how the engine performance maps are obtained.
16. What are the methods used for calibrating fuel injection pump? Explain one in detail.
17. What is the data required for drawing heat balance sheet? Explain with suitable examples.

****

Code No. 2116

FACULTY OF ENGINEERING

B.E. ¾ (CSE)I Semester (Backlog) Examination, December 2019

Subject: Database Management Systems

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

Note: Answer all questions in Part – A & answer any five questions from Part – B

PART-A (25 Marks)

1. List the disadvantages of file system. [2M]
2. Distinguish between primary and super keys. [2M]
3. Mention various DML operations with examples. [2M]
4. What is a view? Explain it. [3M]
5. Write the syntax for UPDATE command in SQL. [3M]
6. Explain the advantages of check pointing. [2M]
7. Explain about deadlocks. [3M]
8. Explain about hash based indexing? [3M]
9. Discuss about different types of failures [2M]
10. Write about buffer management? [3M]

PART-B (50 Marks)

11. a) Explain the detail about Database Management System advantages over file management system. [5M]
    b) Explain the architecture of DBMS. [5M]

12. Consider the following schemas: [10M]
    Sailors (sid, sname, rating, age)
    Reserves(sid, bid, day)
    Boats (bid, bname, color)
    Write the following queries in relational algebra, tuple relational calculus and domain relational calculus:
    a) Find the name of sailors who have reserved boat 103.
    b) Find the names and ages of sailors with a rating above 7.
    c) Find the names of sailors who have reserved a red boat.
    d) Find the sname, bid and day for each reservation.
    e) Find the name of sailors who have reserved at least one boat.

13. a) Explain the purpose of normalization and schema refinement. [5M]
    b) Explain the role of minimal cover for set of FDs in 3rd normal form. [5M]

14. a) How to compute closure of set of functional dependency? Explain with a suitable example schema. [5M]
    b) What is multi valued dependency? State and explain fourth normal form based on this concept. [5M]

15. Explain the ARIES recovery method. When does a system recover from a crash? In What order must a transaction be undone and redone? Why is this order important? [10M]

16. a) Distinguish between: [5M]
    i) Primary and secondary indexing (ii) Ordered indexing and hashing.
    b) Explain in detail about B+ trees. [5M]

17. Write short notes on the following:
    a) Conflict Serializability [4M]
    b) Types of Joins [4M]
    c) Thomas write Rule [2M]

****

Code No. 2121

FACULTY OF ENGINEERING

B.E. ¾ (IT) I- Semester (Backlog) Examination, December 2019

Subject: Database Management Systems

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

PART – A (25 Marks)

1. Define two-tier and three tier architecture. 2
2. What are the benefits of Database Views? 2
3. Write Syntax and Example on SELECT command with all optional clauses. 3
4. Discuss String Operations with suitable example in SQL. 2
5. What is Integrity Constraint? List any two types of Integrity constant. 3
6. Differentiate between 3NF and BCNF. 3
7. Draw and Explain transaction states. 2
8. What are the advantages of B+ trees over B-trees? Give example. 3
9. Differentiate between validation-based and Timestamp-based protocols. 3
10. Define multiple Granularity with example. 2

PART – B (5 x 10 = 50 Marks)

11. a) Explain the concept of Generalization, Specialization and Aggregation with an Example. 6
    b) Explain Database Users and Administrators. 4
12. a) Explain Set Operations and NULL values with suitable SQL queries. 5
    b) Explain Additional Relational-Algebra Operations with suitable example. 5
13. a) Elaborate Dynamic SQL. 4
    b) Discuss all Normal Forms based on Functional Dependencies. 6
14. a) Insert the following keys in a B+ tree for the order n=5 6
    4 7 13 16 21 24 29 32 37 41 45 49 57
    b) Explain recoverable schedules and cascadeles schedules. 4
15. a) What is locking in DBMS? Explain lock based protocols. 5
    b) What is recovery and Atomicity? Explain with log-based recovery mechanism. 5
16. a) Explain Deadlock prevention strategies. 5
    b) What are the differences between Primary Indexing and Secondary Indexing? 5
17. Write short notes on
    a) Trigger Syntax with example in SQL 3
    b) Buffer Management. 3
    c) Dynamic Hashing 4

****